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PetFish

Monthly 2s 6d

Vol. 1 No. 10
January, 1967

Subscription rates: £1 1s for 12 issues; 17s 6d for 6 issues (U.S.A. and Canada $5.00)

Editor: Anthony Evans

In This Issue

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PetFish Publications

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Comments and Quotes

Brightness can conceal ● Tilapia of Lake Victoria ● Goldfish prefer blue

Camouflage by Reflection

FROM observation of a silvery fish in an aquarium, where some of the light is coming from the side, it might seem highly unlikely that the bright silver appearance is of any use as camouflage. Nevertheless the silveriness does serve such a purpose under natural conditions for the fish and some interesting research by Dr E. J. Denton and Dr J. A. C. Nicol, of the Plymouth Marine Laboratory, reported in the JOURNAL OF THE MARINE BIOLOGICAL ASSOCIATION (U.K.) has shown how this comes about.

The light-reflecting property of the skin of silvery fishes is given by layers of closely packed thin crystals of the substance guanine and plate-like reflecting cells. It is the arrangement of these reflecting plates in relation to the body surface of the fish and to the source of light (the water surface) that makes the fish almost invisible from most directions.

These plates reflect the light falling on them so well that there is very little contrast between surface of the fish and the background when it is viewed under water from below or from the side. This form of camouflage is greater when the silvery fish has a flat thin body than when the body is more rotund. However, the more cigar-shaped body is the one associated with greatest swimming speeds, and as the report from Plymouth puts it: "Most fish have shapes which represent a compromise between adaptation for such desirable qualities as speed, manoeuvring and invisibility".

Cichlids in the Lake

SIX species of the vegetarian cichlids of the genus *Tilapia* are found today in Lake Victoria. Two of them, *T. esculenta* and *T. variabilis*, have always been there, but the others—*T. zillii* and *T. nilotica*, from northern tropical Africa, *T. leucosticta* from Lakes Albert, Edward and George, and *T. melanopleura*, from southern tropical Africa—were artificially introduced to the Lake in 1951 and have now established themselves. All of these except *T. zillii* are mouthbreeders. At least two of the species, *T. nilotica* and *T. variabilis*, are interbreeding and their hybrid progeny are frequently caught from the Lake. It is possible that *T. zillii* and *T. melanopleura* are also interbreeding, for these are known to be capable of hybridising.

Dr R. L. Welcomme, of the East African Freshwater Fisheries Research Organisation, Uganda, has recently reviewed in NATURE what is known of the present distribution and habits of these cichlids in Lake Victoria. Competition between them for food does not appear to have curbed their numbers, there being abundant plant growths of the types individually favoured (planktonic diatoms by *T. esculenta*, higher plants by *T. zillii*, bottom growths

by *T. leucosticta*). Breeding areas are the subject of greatest competition, however. *T. zillii* is the odd man out in this because it alone puts its eggs in a shallow nest on the bottom, which it guards, and it therefore chooses mainly the clearer shallow sandy areas of the Lake.

The young *Tilapia* of all species grow up in regions called 'nursery beaches', sheltered regions of shallow water with rich plant growths. Here the daytime temperature of the water reaches heights that would kill fishes of other genera. It has been found that the youngsters vary in their choice of water with reference to its oxygen content, however. In the nursery beaches with water having least oxygen *T. leucosticta* young are found; *T. esculenta* and *T. nilotica* prefer better aerated regions and the other species seem to frequent the slightly exposed well-oxygenated areas.

In recent years water level in Lake Victoria has been higher than any recorded since 1899. This rising level has made large, shallow, swampy, rich feeding grounds for the *Tilapia* and plenty of suitable nursery beaches. Consequently their numbers and adult size have steadily increased. But if the level falls again, as it is likely to do in due course, the fisheries experts expect there will be decreases in the *Tilapia* population as conditions become less favourable for at least some of them.

Blue for Goldfish

CAN fish see colours as we see them? For some fishes the results of experiments have shown that they can distinguish colours in ways that indicate possession of full colour vision. Most recently the goldfish has been investigated by Dr W. R. A. Muntz and Dr J. R. Cronly-Dillon of Oxford University, who found this fish able to recognise all shades of red, blue and green.

The observations were made by watching the behaviour of goldfish towards the colours when the obtaining of food depended on their ability to learn the differences between the colours. The investigation, reported in ANIMAL BEHAVIOUR, also showed that goldfish were able to learn most rapidly when blue rather than green was the test colour associated with food.

This suggests that goldfish may have a natural preference for this colour. Coldwater fans please note: blue backgrounds might make your goldfish more contented.

LETTERS

Split Fins of Guppies

I WAS interested to read the article on fin splitting in guppies by my friend Jim Kelly (PETFISH MONTHLY, November). I, too, have thought for some time that the cause was genetic, but did not at first realise it was the female who was the trouble, though I wondered why it tended to skip a generation. I wonder if I could crave space to take up a point or two?

The first is probably a misprint. Al Klee in his Hahnel delta by XCh XCh cross got mainly double swords as expected, but 8·4% of the males (about 1 in 12) were deltas as a result of crossing over of the Cp gene.

The theory of splitting being due to a combination of the genes Co and Ds is interesting, but I am afraid it will not work with my fish. I have black deltas line bred down four generations, and now get all broadtail males in the broods, mainly deltas. The females all have dusky black caudals and dorsals. Thus my females must be of the genotype XCp XCp, and the males either XCp YDs or XCp YCpDs (no double swords among the young). Thus there is no room for the Co gene. Also I have given virgin females to several fellow F.G.A. members to cross with their males, but have seen no evidence of the Co phenotype among the male young. Yet despite this absence of Co I am plagued with split fins! The fish mentioned which split its fin XCo YDs should not have been a broadtail, but according to Al Klee a stunted double sword (no Cp gene but Co which inhibits double sword).

But enough of the technical stuff. As Jim rightly says, the problem which concerns us is how to stop the splitting? I am sure his advice is right, breed from males which do not split their tails, but here is a problem. We usually breed from females at 3 months old, and the male may not split his caudal until 7 months old. How often have we seen father split his tail the day his young are born! My solution, which I hope will work, is to breed with the females a generation out of phase with the males. Take your 3 month virgin females (keeping the males to one side) and cross them with their uncles or father whose tail is sound (now aged about 7 months). Cross the females from this brood at 3 months with the sound-tailed males from the batch put aside and so on. At the moment I am only in phase one so do not yet know the answer.

Enfield, Middlesex A. F. J. ATKINS

Should Judges be Graded?

FOR several years the Federation of British Aquatic Societies has had a scheme for the appointment of judges, whereby on the recommendation of one or more affiliated societies an aquarist may be graded a 'B' class judge, and after suitable experience may re-apply to be upgraded to 'A' status. A proviso laid down, however, is that only 'A' class judges are considered competent to judge 'Open Shows' with 'B' class judges restricting their activities to table shows at their own and neighbouring societies' meetings. A recent scrutiny of the list of judges revealed that there were only 11 'A' grade judges within the British Isles, and these in the main were confined to areas within reasonable travelling distance of London. Are we to assume that these 11 are to have a

Continued on page 313

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LETTERS

Continued from page 310

monopoly of the whole show-judging of the societies affiliated to the Federation? If so, I foresee great difficulties.

Considerable expense is involved. To cover a one-day show effectively, with the judging taking the minimum time, I have found it necessary to employ four judges. This figure can, perhaps, be cut by half but even then the travelling expenses, judging fees etc. involved in bringing an 'expert' from London or surrounding areas would be grossly prohibitive. In addition, shows would doubtlessly clash from time to time. What is one to do therefore (taking a hypothetical case) if the annual shows of Portsmouth A.S., Hendon A.S. and my own society of Newport clash? Who has the 'A' judges? Do we share them, flying them from show to show by helicopter? (cost per hour of hiring such a machine is a minimum of £36.10.0 for a Wessex or £194.10.0 for a Whirlwind, dependent upon availability!).

Surely the time has come for the Federation of British Aquatic Societies to do away with 'A' and 'B' grade judges, classifying everyone as simply an 'F.B.A.S. judge', or is there some good reason for these gradings?

On a totally different theme is it not time, too, that Federation assemblies were periodically held away from London? Perhaps then we would have the drastic changes so necessary, and the word 'British' in the title really meaning what it is supposed to. In conclusion I must say that the above statements do not necessarily reflect the views of my own Society but are purely and simply my own.

M. J. PARRY
Show secretary, Newport A.S.

Blue Fins Galore

DURING July I purchased a pair of blue fin dace, placing them in tank I. Two weeks later they were placed in tank II. I then read up on these fish and found the female laid a few eggs at a time over a period of several days, so I decided to give them a tank of their own and keep *Daphnia* in there to prevent them eating any eggs or young. Eventually, a further 2 weeks later (now in the middle of August), I placed them in tank III. After 2 days the female was found dead without apparent reason. The male was then removed and the tank left idle just in case. After a week I saw no sign of life so stripped the tank down. The plants (hornwort) that I had been using were taken out, laid to one side, and what with one thing and another they were fairly dried up by the time they were replaced. A week later a pair of White Cloud Mountain minnows were put in this tank (III) for spawning.

Prize Letter

The following morning my youngest daughter rushed into the bedroom to inform me that there were baby fish in the tank. I got up, and sure enough there were. I immediately netted out 23 baby dace and placed them in tank IV. These are now 1 in. long. Now here comes the punch! On the last day of October baby dace ¾ in. long were found in tank I. This is 2½ months after the parents had been in this tank; not only that, there are nearly 100 fish in this tank and thousands of snails. Nor was anything removed from one tank to another other than has been described, and the female had been dead for 2 months. Time will tell if these are grossly stunted or if they came out of the blue.

Last night I even had a nightmare—blue fin dace were swamping all my tanks and nothing could keep them down. Anyone want some blue fins?

Nr. Christchurch, Hants. P. MALLETT

School Aquarium Project

AS a completely newcomer to the hobby of tropical fish, may I ask if any of your readers or similar groups have any unwanted copies of aquarist magazines (back issues) or any other literature or colour pictures dealing with tropical fish for the school aquarium project which I have just taken over. There is considerable interest in this project in the junior school, and now the infant department would like me to start one, so any help in any way will be most appreciated.

Butts School,
Butts Road,
Walsall, Staffs. G. MASON

Congratulations for the North

I WOULD like to express my congratulations to the clubs and dealers who made the Manchester Festival a success. Our Society (Mid-Herts A.S.) travelled to Manchester from St. Albans by coach, arriving at 10 a.m. From the start it was obvious we should not have enough time to see it all.

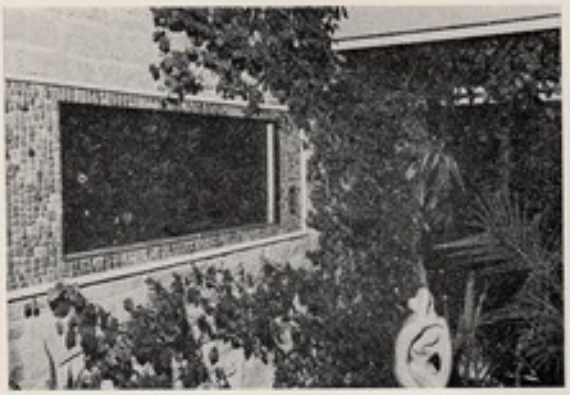
Through a misunderstanding over catering we thought we would be unable to get a lunch, but on approaching the F.N.A.S. stand we sampled some of the much-spoken-of northern hospitality. The F.N.A.S. arranged a very nice lunch for us and a visit to the back of the Belle Vue Aquarium, where Mr Taylor entertained us for a very wonderful hour. My thanks to the steward who did the spade work and Mr Taylor for the entertaining and educational tour. I shall look forward to the next Manchester Festival.

D. R. LELLIOTT
Public Relations, Mid-Herts A.S.

Colour Preference by Sharks?

WITH reference to the behaviour of red-tailed black sharks, I thought your readers would be interested to know that I have such a fish in my tank that has made its home amongst rocks which it guards at all times from other fish. On introducing a short-finned black mollie, I noticed that the mollie was allowed to roam anywhere it liked, even amongst the shark's 'home' without being chased or bullied by the shark. In fact any member of the mollie species is allowed to roam in the shark's 'home' so long as it is black in colour. I do not know whether this is because both fish are the same colour or whether sharks are naturally frightened of mollies.

Isleworth, Middlesex R. IVES



How the author designed and made the built-in aquarium (shown here in the hall of his home) is described in this article and in its continuation in next month's issue

By F. N. GHADIALLY,
M.D., Ph.D., D.Sc.(Lond.)

Decorative Aquaria for the Home

Photographs by the author

MOST aquarists maintain at least one decoeative aquarium in their home. Indeed the first tank assembled by the beginner falls in this category. However, for many of us this is just the beginning, and as the years pass and experience accumulates we create bigger and better aquascapes which reflect not only our ability as aquarists but also as scientists and artists.

The purpose of this article is to discuss some of the problems involved in the creation of aquascapes and also to describe and illustrate a somewhat unusual tank that graces the entrance hall of my home. This is not an article on how to set up a tropical aquarium, for that subject has been adequately covered in numerous books and aquatic journals. Our purpose is to examine what means are available to make the so-called lounge tank more attractive and at the same time more easily maintained so that it is a source of perennial interest and delight to the beholder. The aesthetic and scientific problems involved in creating these attractive aquascapes have received much thought and study, with the result that today it is not too difficult to create a decorative tank needing only a minimum of care and maintenance.

Hiding the Frame

Strange as it may appear the very first thing that detracts from the aesthetic pleasure of the tropical aquarium is the tank itself. The common glazed angle-iron aquarium has many undoubted merits but few would consider it a pretty object in its own right. The chief objection is the angle-iron frame itself, for even when this is painted in pretty colours it is virtually impossible to make it harmonise with the decor of a well-appointed modern home.

One solution would be to follow a well-known artistic principle, which states 'if you cannot hide it, make a feature of it'. This approach has led to the creation of many ornate elaborate wrought-iron stands with associated plant holders (for house plants), glass shelves and other knick-knacks attached to it. The angle-iron aquarium certainly 'blends' with the wrought-iron stand but many aquarists feel that all this ironmongery with its paraphernalia detracts from the interide of the tank, which should of course be the main point of interest. Further not all of us are wrought-iron enthusiasts and while such a set may blend with some types of interior decorative schemes in the home it is hopelessly out of keeping with most others.

Therefore most aquarists have in fact attempted to follow the opposite course, that is instead of attempting to make a feature of the angle-iron frame they have tried to hide it.

This has led to the evolution of many ingenious and successful schemes. One of the most satisfactory of these is to house decorative aquaria in the alcoves on either side of the fireplace. A light supporting wall is built covered with hardboard, plywood or other material

with cut-outs which reveal just the glass fronts of the tanks but hide the angle-iron frames. The apertures themselves can be made attractive by edging with suitable plastic or picture frame moulding. Feeding and maintenance is carried out through hinged or otherwise suspended flaps placed just above the tanks running along the length of the new wall.

Needless to say, not all the alcove space has to be given over to fish tanks. Book shelves and decorative niches can be incorporated into the design and an otherwise prosaic room with two useless alcoves is converted into something that is attractive and reflects the ability and character of its owner.

Another way to hide the angle-iron frame of the tank is to build some sort of wooden box around it so that it can be made to blend in with the furniture in the room. Alternatively the tank can be incorporated into an existing piece of furniture such as a row of book cases.

All these can be very satisfactory solutions indeed, but if you are about to build a new house you might consider incorporating the tank into a wall of the house.

Losing the Box Effect

One would imagine that aquarists at least would accept a tank as a tank and love it for what it is, but this is not so. Much ingenuity and effort have been exerted to delete the tank from the final visual picture. The less you see or even feel the presence of the tank the better.

It is argued that the final picture should reveal only plants, fish, rockwork and gravel but not the rectangular glass-sided box containing these objects. The final effect aimed at is that of a 'cross section' through a body of water.

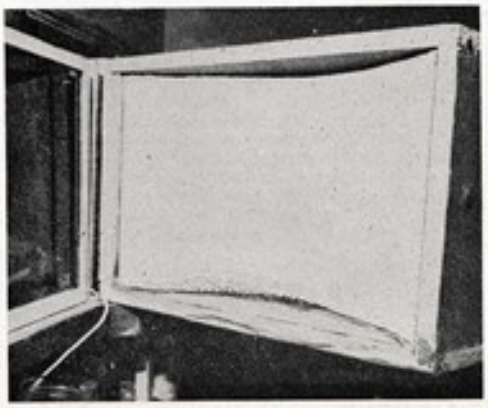
Having removed the angle-iron frame from sight what methods are available to undo the boxy look of the average aquarium? The bottom of the tank covered by gravel and rockwork is blissfully out of sight and causes us no concern. The water surface, preferably with a few floating plants added, again is quite pleasant and natural to behold and does not constitute a problem. What makes an aquarium look like a glass box is its back and two ends. Steps must be taken to obliterate them from view. Let us take the back first.

One way of removing the back from sight would be to build a very wide tank so that the sheer distance of the back glass from the front renders it invisible or almost invisible even when the water is crystal clear. This, of course, is only a theoretical concept as far as the average aquarist is concerned, for few could find room for a tank many feet wide. Nevertheless it is true to say that a tank of great width (say about 2 feet or so) makes a far more impressive final picture than the 12 inch wide tank usually employed. Further it must be remembered that refraction of light through the water makes the tank look even less wide from front to back than it really is.

Another way of giving added depth to the aquatic scene is to build a wood or hardboard box behind the aquarium containing rockwork and some plants (terrestrial or plastic). Such a box has only three sides; the glass back of the tank forms its front. If this box is now illuminated by an overhead light and the back glass of the aquarium kept clean and free from algae then the much desired look of a deep body of water is obtained. Some quite attractive effects can be produced this way. Nevertheless this idea is not worth serious consideration where a permanent easily maintained set-up is required. The snag in the system is keeping the back glass scrupulously clean or else the illusion of depth is quickly destroyed.

A simple and practical way of hiding the back glass would be by a thick growth of plants. One can also build up an artificial rock face so that the back is hidden by a screen of rockwork, or better still a combination of plants and rockwork can be used to cover the back glass. Since the rockwork screen is bound to be fairly thick it is obvious that such an exercise can only be satisfactorily executed in a fairly wide tank. The manner in which such rockwork can be built up will be described later.

Let us now see how the ends of the tank can be removed from sight. This is a difficult problem, for simply masking them with rockwork or a plant screen or both will accentuate rather than destroy the box-like



One way of creating the effect of increased depth for the aquarium scene is to place a box to contain rockwork or artificial plants, or both, behind the back glass. A background of this type is shown here. It has been swung away from the rear of the tank (left) against which it is normally positioned. Within it is set a painted sheet of expanded polystyrene that is bent to form a curving surface

The angle-iron frame of the author's special aquarium before glazing. The front (facing camera) is 4 ft. 6 in. long and the two extreme back corners are 7 ft. 6 in. apart. Numerous vertical and a few horizontal cross-struts were used to prevent bowing of the frame

effect. Fortunately, in recent years a system of doing this has been evolved. I believe that such tanks were first exhibited at the Monaco Aquarium, and hence they are sometimes referred to as Monaco type tanks.

Monaco Aquaria

The basic idea here is to build a tank with angled ends. It will be appreciated that if the ends are sloping enough they will disappear from sight. The only objection one could raise is that the arrangement reduces the apparent size of the tank, for a tank is judged by the size of the front glass of the tank. Nevertheless this is a very worthwhile proposition for it completely destroys the box-like look of the interior and permits some really fine aquatic scenes to be constructed. An added advantage is that the corners of the tank provide generous accommodation for all the heaters, wires and tubes one could wish to introduce into it. As you no doubt already know, camouflaging these in the ordinary tank is no mean feat.

Incidentally the original Monaco type aquarium had a curved blue perspex back, which was illuminated from outside. The result when viewed from the front gave the impression of looking into a great depth of blue water. Tanks of this type can be seen in some public aquariums in this country. Not all of them, however, have been fully successful. In some the ends do not slope away from the front glass enough, with the result that they are still visible and hence detract from the aquatic picture.

Some very successful examples of this type of tank can be seen in the Belle Vue Aquarium, Manchester. But such tanks are not just suitable for public aquariums, they can be modified to produce some very attractive aquaria for the home.

A Built-in Design

The chance for me to build such a tank arose a few years ago when I was about to build a new house. The tank was designed as an integral part of the house. The picture shows the shape and size of the angle-iron frame that was made. Its overall length is 7 ft. 6 in., but the front glass is only 4 ft. 6 in. long. The tank frame is 2 ft. high and 20 in. wide.

The back frame is not straight as in the conventional tank but has been broken thus creating an irregularly pentagonal tank. Although in the Monaco type aquarium a curved perspex back was used I thought that it would be difficult to keep such a back clean, particularly since perspex scratches so easily. A conventional straight back would have reduced the width of the tank and a long straight wall of rockwork covering it would not have looked very attractive. Breaking the back off-centre solves these problems.

It was decided to use fairly robust sections of angle iron and multiple ties so that a rigid frame would result. The bottom frame of the tank is made of 1½ in. by 1½ in. by $\frac{1}{8}$ in. angle iron; the top is made of lighter material (1¼ in. by 1¼ in. by $\frac{1}{16}$ in.). The ends were glazed with ¼ in. thick rough cast glass. Since multiple ties (T sections wherever possible) were used and the glass is bedded with glazing compound not only against the angle-iron frame but also against the ties this thickness of glass has proved quite adequate.

Glass and Glazing

The thickness of glass needed for glazing a given tank is primarily dependent on the depth of water it holds, for it is this factor which determines the pressure to which it is subjected. Nevertheless, this is not the only factor which will determine whether the glass will break or not. The rigidity of the frame will also have a bearing. If the frame bends or bows with the water pressure the glass will be severely stressed and will probably break. The longer the length of tank and glass the greater the chance of bowing and breaking. We can counteract this in two ways. One is by making the frame more rigid, by the use of ties, or by using thicker glass. Both methods were employed for my tank. The front glass is ¼ in. thick and more than able to withstand the pressure exerted by 2 ft. of water. The back is in two pieces and supported by a most liberal number of vertical ties. Further horizontal ties at top and bottom help to resist the bowing which might occur from water pressure.

The bottom of the tank takes a massive load for it has to support not only the water but also a large amount of gravel and rockwork. Therefore a double thickness of ¼ in. glass was used to glaze the bottom.

The glazing of such large tanks presents many prob-

lems. The chief one is that the water pressure soon squeezes out the glazing compound lying between the glass and the angle iron and then the tank begins to leak. To overcome this the tank had to be glazed very accurately, leaving only the desired amount of glazing compound (approx. ¼ in. thick) behind. Then the tank was allowed to stand in a warm dry place for the glazing compound to dry and harden. This took some 2 months to accomplish.

As already mentioned, this tank was designed as an integral part of the house, and in fact both were built more or less at the same time.

Installation and the furnishing of Dr Ghadially's unique decorative aquarium will be described in his article in the next issue of PETFISH MONTHLY.

An Orchid for the Tank

By C. D. ROE

Spiranthes cernua is a member of the Orchidaceae that will grow under aquatic conditions

THIS plant, which is possibly a form of *Spiranthes latifolia* which has adapted itself to submerged growth, is the only true orchid we know of which does well as a submerged aquatic. It does equally well submerged or emerse and regularly flowers and multiplies in a clean aquarium. Like other heavy-rooted plants it does very poorly in the immediate neighbourhood of a sub-gravel filter. Young plants are sent out singly on runners, usually up to four runners developing almost simultaneously, after which it produces a tall spike of pale yellow or cream flowers above the surface. It has been known to find no difficulty in doing this in 2 feet of water. The leaves when grown emerse are a light glaucous green, and when grown submerse are a bright light green. The whole plant is of a fleshy nature, the roots being quite thick. The plant is inexpensive and usually obtainable. It is very probable that this plant could be grown in coldwater tanks with temperatures not dropping below 50°F (10°C).

PETFISH photo competition

Two prize-winners

Category II: Colour prints and transparencies. Runners-up to the first prize winners named in last month's issue included Mr K. Hope (Hounslow, Middlesex), for the 35mm. colour transparency of the catfish shown above, and in the garden pond division Mr. I. Baker (Tuffley, Gloucester), for the colour print (right). A further picture is shown on page 326

Tape Lectures and Slide Shows

AIREBOROUGH and D. A.S. have successfully completed negotiations with well-known Canadian author and lecturer, Mr W. L. Whitern, F.Z.S., for the sole British distribution rights of a series of tape lectures which he is now publishing. The first three of a series of thirty are due to arrive no later than January, and the Society is now taking bookings from any society or individual who would like to hire them. Titles of the first three tape lectures are:

1. White Spot (Ichthyopthirius)—do you really know what is the basic cause of fish becoming infected with this disease?

2. Aquarium Management—why this is so important, particularly when breeding is being attempted.

3. Foods and Feeding—are commercially prepared foods really nutritious, particularly when compared with foods obtainable from the normal commodities available in the average home?

These tape lectures will run for approximately 1 hour and the cost of hiring them is 10s each plus 2s postage.

Mr Whitern has also produced booklets, which will be a complete printed recording of each lecture, as he feels that very few people remember a lecture's most salient points a few days later. These have 25 to 30 pages (cost 2s) and will be offered to the hiring societies on a sale or return basis as societies receive 6d for each copy sold this offsets the cost of the hiring of the tape lecture.

Aireborough also have three slide lectures for hire. At the moment the lecturer will have to accompany them, but any society interested, within easy travelling distance, may write in and book a date for the lecture to be put on. These slide lectures are:

1. The American Scene—50 slides on the activities and fish of an American Society.

2. Belle Vue Festival etc.—50 slides of the 1966 British Aquarists Festival, the fish, displays etc. Also of members' furnished aquaria.

3. The British Scene—50 slides of local members' fishes, set-ups, furnished aquaria etc.

Interested societies are asked to contact Mr R. E. Hampson, The Headlands, Scotland Lane, Horsforth, Nr Leeds, Yorks.

A course for the would-be breeder of tropicals

Part 9

By D. B. McINERNY
(*McLynn's Aquarium*)

Breeding Angel Fish

OF all the freshwater tropicals, perhaps angels are responsible for bringing most newcomers into the hobby. This is mainly because of their exotic shape, which is so different from the normal fish outline carried in the average person's mind. Angels have a dignity few other species possess and, though not brilliantly coloured, are usually sought by the beginner who starts his first community tank.

Perhaps of all the egglaying species, most aquarists who have tired of breeding livebearers would dearly love to breed some angels, but they consider it almost impossible; and even amongst experienced fish-keepers few can even sex angels definitely.

Over 30 years ago one of the best books on tropical fish intimated that when two angels spawned, and all the the eggs turned opaque and white during the following 2 days, it was most probable that both fish were females and the eggs infertile. This belief has been repeated over and over again for years, and is now so firmly fixed in the minds of most aquarists that it is almost impossible to dislodge.

The Right Conditions

However, I can state after 35 years' experience that such a happening is so rare as to be almost non-existent. If two angel fish spawn together you can be pretty certain that they are a pair; but if the water conditions are wrong then you must expect all the eggs to turn white. This is because though the eggs have a protective shell, Nature cannot cope with all conditions but only those in which the species is found. Therefore do not try to alter the fish to suit your conditions. You will fail. But alter the conditions to suit the fish, and you are then most likely to succeed.

Angels can be sexed quite easily when the body size is that of a five shilling piece or more. Behind the long ventral fins a male's body will look as if it has been pinched between thumb and forefinger, whereas the female in this portion will look as if she had swallowed a small pea. This is more noticeable if you touch the front of the aquarium cover glass and the angels rise head on towards you. Once you know what you are looking for sex can be determined even when angels are broadside on, as the slight indent in the male creates a faint shadow in this region, whereas the bulge in the female catches the light and glistens.

Sexing

Once a pair decide to spawn the breeding tubes appear, and now sexing is unmistakeable. The male's tube does not protrude as far, and is quite sharp-pointed. The female's ovipositor is wider, longer and quite broad at its extremity, often being ¼ inch across at its tip.

Some books have stated that males are straighter between ventral fins and the beginning of the anal fin; others that the first rays in the male's ventral fin are more sharp and distinct. Personally, I can find no difference, and even if there were the contrast would be minute, and probably unreliable.

To spawn, angels require a deepish tank, preferring 20 to 24 in. depth rather than 10 to 15 in. They need plants with longish leaves that grow upward at 45 degrees, which are firm enough for them to clean with their mouths and push against to deposit their eggs. Such plants are usually prized possessions and are unlikely to be cheap, and it is somewhat annoying if a good breeding pair of angels spawns, as they can do, every 8 days for over a year, always on such plant leaves; as more often than not it will be necessary to cut the leaf off and transfer it with the eggs into a shallow breeding tank.

Therefore I prefer to provide a bar of green vitrolite about 20 in. long by 2½ in. wide, which I lean against one of the side glasses of the aquarium of the spawners' tank. Such bars can be cut and bought quite readily from a glass works. The material is ribbed on one side

and smooth on the other. I place the smooth side upwards.

A good pair of angels should have a deep tank to themselves, containing about 2 in. of sand on the bottom in which to root elegant plants, and in which one can insert the bottom of the bar. Fill the tank with clean rainwater, and maintain the temperature between 78° and 80°F (26°C).

If the pair agree, within a few days the male will make advances to the female, and one may see both fish facing each other, say, an inch apart, and jerking their dorsal and anal fins. This is done by spreading the fin rays rapidly from a relaxed position to an erect one, several times in succession.

If the female is ready to spawn her ovipositor will shortly begin to protrude, and the male will busy himself inspecting and cleaning with his mouth the vitrolite bar or plant leaf—and let us hope it will be the bar, and not your choicest plant!

Spawning

The following day most probably the female will begin to spawn on the selected and accepted site; she gently presses her ovipositor against the lower portion of the leaf or bar and, using only her pectoral fins, propels herself slowly forward and upward. At the same time her ovipositor drags or bumps against the bar or leaf, and at regular intervals the adhesive eggs are closely deposited in a single line. After moving about 1½ inches she will glide away and the male, with a similar movement, ejects his sperm over the line of eggs just laid. Then, on reaching the top egg, he turns and makes way for the female to come in again and lay a second row of eggs.

The procedure is repeated until there is a patch of eggs measuring about 2 in. long by ½ in. wide and numbering between 200 and 350. These will look a silvery grey, and now the parents will begin to fan them with their pectoral fins. Sometimes both fish take turn and turn about; sometimes the male will drive the female off and accept full responsibility alone—usually if he distrusts her and imagines that she desires to eat them.

Every now and then he may appear to peck at an egg. Do not worry. He is probably removing some enemy, say a tiny snail or an interfering infusorian, that he considers is better elsewhere or eaten.

A few good pairs of angels will rear their offspring in the tank, if the water is clean enough and soft enough, and a wonderful sight it is when this occurs; but it is a risk, and if you wish to raise this spawn it would be safer to remove the eggs and hatch them in a breeding tank on their own. Then, having some babies in hand, you can more readily leave the second spawn, when it arrives, to the mercy of the parents. But I find that once the parents have eaten their eggs they will almost certainly always do so thereafter.

Assuming one is removing the eggs to safety, prepare immediately a breeding tank 24 in. long by 8 in. by 8 in. Place in this nothing but clean rainwater, or preferably peaty water. Maintain a temperature of 80–82°F (27°C). If you have only rainwater you must add sufficient methylene blue solution to colour it a royal blue. This will kill harmful bacteria etc.

If the spawn has been deposited on the vitrolite bar you are lucky. All that is necessary now is to remove the bar from the spawning tank and place it horizontally in the breeding tank. Place it on edge with the eggs facing you, and wedge the far end of the bar in one of the back corners of this tank. This will ensure it is held securely in the right position. Now place an aerator diffuser about ½ in. in front of the eggs, and supply gentle aeration, so that it creates a flow of water near the eggs, but not so that the air bubbles will dislodge them. I find it best to pass the air tube to the diffuser under the bar, where its weight will hold it perfectly.

If the spawn is on a plant leaf the job is more tricky. I attach the stem of the leaf to a chunk of slate, and secure it in position with a rubber band.

Here again, manoeuvre the leaf so that the eggs are facing you, and again supply aeration to create a current of water not over, but close in front of, the eggs. Aeration is essential, because you must follow Nature, and without having the parent fish to fan a water current about the eggs you must improvise.

This movement of water ensures that Infusoria or bacteria are not allowed to settle on and damage the eggshells, and also that a constant flow of oxygenated water is supplied to the spawn.

Methylene blue has its drawbacks. It will not harm the eggs or fry, but when it comes to feeding Infusoria to the newly hatched fish, it will kill this and the fry may starve. The warning will come when you find a few dead baby angels lying on the bottom of the tank.

The only thing to do then is to siphon off half the blue water, and replace with clean rainwater; but here again, the sudden disturbance and change may result in more losses. Those of you who have followed my articles in PETFISH MONTHLY from the beginning, and have taken the trouble to prepare long ago the peat water I advised, will now begin to benefit. The peat water you made may not be soft enough yet for breeding neons and cardinals, but it should be fine for angels. So those with this peat water should fill the 24 in. by 8 in. by 8 in. breeding tank with this water, and place the angel spawn in it as described above.

Maximum Hatching

This water will contain only the Infusoria and bacteria that the shells of the angel eggs were made by Nature to resist, and thus you will not have nearly so many eggs become opaque and white, due to punctured eggshells by bacteria etc. Moreover, when the eggs hatch the babies are in soft water, and Infusoria fed to them later will not be killed off so readily. Thus there will not be the checks that those using rainwater must expect. Your angels will go ahead quicker and far better, and losses should be negligible.

The eggs of the transferred spawn will hatch in 3 days. Do not attempt to remove any that turn white. They will not harm the others, but you can very easily damage perfectly good eggs by bruising them or even puncturing them.

On the fourth day the fry will be seen wriggling, each suspended by a fine sticky thread attached to their heads. Be sure now that the aeration does not break this thread and blow them off the bar or leaf, where they will be out of the gentle water current, and stick on the

bottom of the tank. Each fry has a yolk sac from which it derives nourishment, so do not give any food. They cannot eat it, and it will only cause fouling and growth of bacteria.

On the eighth day the fry will become free-swimming, and will look like a cloud of gnats as they move gently along. Now is the time to give the first food, Infusoria, and plenty of it. This must, of course, have been cultured beforehand, as I have often stated.

Your first batch of angel fry will thrill you as nothing has before, and you can be justly proud of your achievement. After 5 or 6 days you can introduce a little newly hatched brine shrimp to their diet, and thereafter increase the shrimp and decrease gradually the Infusoria. In a further week to 10 days serve a very little micro-worm, but do not overdo it as the worms quickly sink, and angel fry are not adapted to be bottom-feeders.

In 3 weeks the fry, which are longish and look like anything but angels, will begin to develop the characteristic dorsal and anal fins and (were you in any doubt before, you will now know they are angels); they can then be fed with a very fine grade dried food. Once this stage is reached, all they will need is good food and plenty of space to develop into worthy fish.

There are three known species of angels: (1) *Pterophyllum eimekei*; (2) *P. altum*; (3) *P. scalare*. The last two are much rarer, and it is doubtful if there are any of these north of Panama. But through line breeding we have today the silver angel, that is the natural one, the black lace, the jet-black and veiltail angels of all these colour varieties.

Once I had some really beautiful blue angels, a true pale blue all over, with deeper blue bars, and bright gold ventral fins. They spawned, and not wishing to disturb such treasures, the eggs were left with the parents. The pair ate them and, alas, never spawned again! Hence my warning—remove the eggs, until you have secured at least one batch of healthy growing fry.

Transatlantic TOPICS

By JIM KELLY

VISITORS to the British Aquarists Festival last year will have been intrigued by the wonderful model Hovercraft displaying the fish from the Isle of Wight Aquarists Society. These keen types must surely qualify for the British long-distance trophy where attending fish shows is concerned. If a world trophy were given for this then it goes without doubt to Bob Isherwood of Vancouver, Canada. Bob recently travelled 3,000 miles with his guppies to show them at the Guppy Associates Show in Toronto. If you cannot comprehend just how far that is try thinking of five trips from Land's End to John O' Groats! Phew!

* * *

It is easy to overlook the odd dead fish in our tanks but one aquarium curator recently could hardly have made this oversight. 'Namu', a killer whale measuring 21 feet 11 inches, was found dead in his tank in Seattle, Washington Aquarium. It was captured in June, 1965 by Ted Griffith and was one of the very few killer whales kept in captivity.

* * *

Followers of the goldfish cult will be interested to know that the National Goldfish Society of America has re-formed under a new banner: 'The American Goldfish Society'. Coldwater fans interested in learning more can get in touch with them at 62-60 99th. Street, P.O. Box 114, Rego Park, N.Y., U.S.A.

* * *

Prisons have been figuring in the news lately but surely the Indiana State Prison at Michigan City has the 'fishiest' tale of them all. This prison boasts a flourishing aquatic group amongst its inmates, the club going under the heading of 'Fin and Gills'. Thanks to the hard work of Warder Captain Koziatek, most of the cells boast their fish tanks and the interest amongst the prisoners is terrific. Boasting 148 registered members, they branched out recently and held an Open Fish Show within the high walls of the penitentiary that attracted 394 fish-keepers and guests. For the visitors the inmates had baked cookies in the shape of fish, made chocolate cake by the square yard and lashings of coffee, milk and Koolade. Entry fees for the show were 25 cents and when I tell you that each prisoner earns only between 30 to 90 cents per week you will appreciate just how keen these lads are.

* * *

Goldfish still 'Top the Pops' as far as the commonest fish kept in the U.S.A. Recent statistics show that 25,000,000 (yes, I've got the noughts right!) are sold annually; one interesting factor to emerge from these figures was that one in eight families living in rural areas had a goldfish in their homes; enter the

Continued on page 323

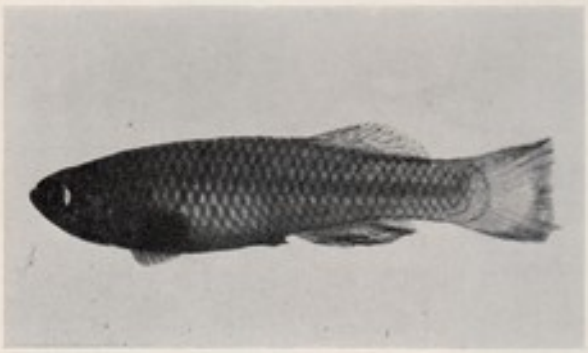
Recent Killiefish Importations

By P. R. STOKES
(Chairman, British Killiefish Association)

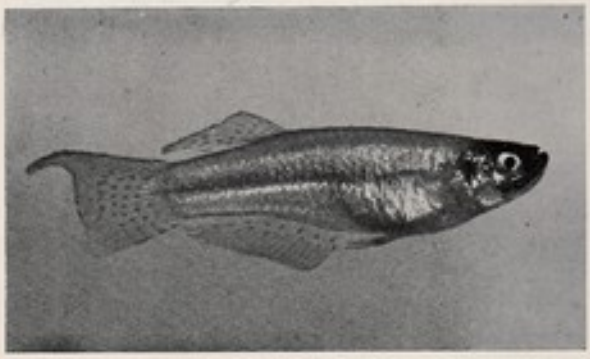
SINCE the British Killiefish Association came into being, many fish have come to light, through this Association. Some of the species have been known before only to ichthyologists and collectors. After discovery they had been named, preserved and finally stored away in different museums throughout the world, including the British Museum, who have been of great help to us since the Association was formed.

On an exchange system with members overseas, many old and new species of this family have come to light—such species as *Cynolebias ladigesi*, *Rivulus agilae*, *Aphyosemion rubrofasciatum* and *Aphyosemion coalheri*, to name just a few. I know these are just names to some aquarists, but in time I hope through the pages of PETFISH MONTHLY to be able to introduce some of these rare and interesting species. Many of these are sent to members through the post, some of them travelling for as long as 17 days in small parcels with very little water and surprisingly without ill-effects. Others have arrived in egg form, to be hatched by killie fans and reared to maturity, which is of great interest to beginner and experienced aquarist alike.

Three of the species that have been imported by members in the last few months are the following.



Aphyosemion cinnamomeum



Procatopus nototaenia

Aphyosemion cinnamomeum (Clausen 1963)

Found, as far as is known, only in a small stream in the rain forest area of the Cameroons, the adult male fish can be brilliantly coloured but does not attain full coloration until at least 8 months old. Thus it differs from most of the genus, which colours early in life. It will, however, live for a lot longer than most, we have found. The main colour is bright cinnamon and dark violet. The caudal fin is rounded with no extensions or filaments; there is a band of violet ending with a broader band of brilliant yellow.

This colour also applies to the anal and ventral fins. These fins are rather small, but always kept well spread. The pelvic fins are deep gold and paddle shaped. The male, so far, has grown to nearly 3 in.; the females are a little smaller and dull grey in colour.

They are being spawned on a peat fibre. This has proved to be a better medium than the more conventional methods of nylon-wool mops so often used these days for killies. These fish appear to be more shy than some. One good point is that there seems to be no great

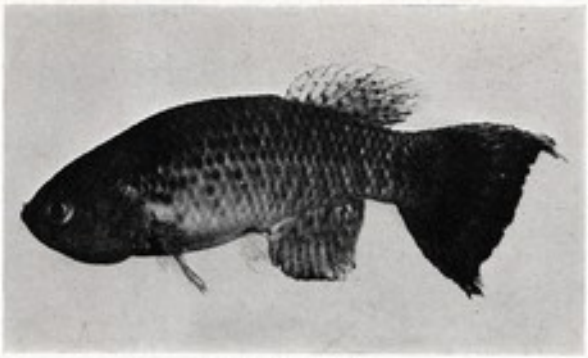
Photographs by T. & K. PAYNE

problem connected with raising the fry, even though they are a slow-growing fish maturing relatively late in life.

Procatopus nototaenia (Boulenger 1904)

There is little known about this particular genus, but we understand that J. J. Scheel, the great Danish ichthyologist, has done a great deal of work in this field. This is a surface-living species found in the Cameroons and in the Calabar region. It has a wide temperature range (70–85°F; 21–29°C) and prefers clear, moving waters. It has a rather translucent body with a blue to greenish sheen. Seen at its best in reflected light, when a metallic greenish blue sheen is seen in the shoulder region. The dorsal and anal fins are reddish orange, with numerous dark spots. The male has a pointed appendage at the back of the gill plates; the female lacks this oddity.

The eggs of the species are laid in soft-leaf plants or even nylon mops. They are laid in small groups around one particular area. The eggs can be collected and incubated like those of the top-spawning *Aphyosemion* species or left to hatch in the breeding aquarium. I understand from other breeders that the eggs are shot into the medium, but I have yet to observe this.



Austrofundulus transilis

Austrofundulus transilis (Myers 1932)

A south American 'annual fish' found in parts of Venezuela. This is a short, deep-bodied fish, of intense colouring. We have obtained a variety having a brilliant metallic green extending from behind the gill plates through to the caudal fin. It also develops large extensions to this fin. The head is rusty brown with a darker bar, reaching from the head through the eye and continuing to the lower jaw. The male is quite boisterous towards the female but is being bred in the same manner as the East African *Nothobranchius* species with fair results.

These are only a few brief notes on some of the many species that are now coming into this country through the efforts of the British Killiefish Association.

Further information on the Association can be obtained by sending a stamped and addressed envelope to the new secretary: Mr Cliff Bill, 120 Buckingham Grove, Kingswinford, Staffs.

Transatlantic Topics

Continued from page 321

cities and the figure changes to one in five! There's gold in them there fish!

* * *

Searching for something different by way of a club programme? Then copy the Sheboygan, Wisconsin A.S. and hold a 'Mystery Fish' night. Club members had to bring a pair of fish along to the meeting suitably disguised in a paper bag. All the bags were placed on a table and as the members left that evening they picked up the first bag to hand.

It sounds fun but having personally witnessed the popularity of the piranha in the States, I bet a few recipients with just the odd community tank were in for a surprise when they tipped out the contents of their 'lucky', or should I say 'unlucky', dip!

* * *

Facts and figures have become such an integral part of our daily lives, hardly any event of importance goes by without we read of some form of poll taken to forecast the outcome, yet despite this very few seem to have been applied to the hobby. Could anyone in these islands, for instance, say with any accuracy just how many aquarists' clubs exist? or their total membership? I doubt it; therefore I was interested to read of some figures published recently in America on this very topic. We expect everything over there to be bigger so it came as a surprise to find out that the total number of fish clubs in the United States numbered under 300 and their total membership was only around the 15,000 mark! Considering the popularity of Tropical Fish over there the fishkeepers must number millions! Room for some good club public relations I should have thought?

If you are breeding *Hoplosternum thoracatum* . . . .

Hoplosternum Catfish

TWO species of these catfish are imported from South America: *Hoplosternum thoracatum* (whose breeding is discussed in this article) and *Hoplosternum littorale*. Both have interconnected heavily armoured plates that join across the back of the fish, unlike the armoured plates of *Callichthys callichthys* which do not meet across the back. The body is elongated, compressed laterally towards the rear end and there are two pairs of barbels on the upper jaw, none on the lower one. *H. thoracatum* has a rounded tail but that of *H. littorale* is forked.

The overall colour is brown, a rather yellowish background being covered by numerous dark brown dots and patches, with the belly and throat lighter in colour. Males are darker than females.

Other sex differences are shown by the spines of the pectoral fins. In the female the pectoral spines are the same colour as the body and shorter than the first soft pectoral ray, whereas the male's pectoral spines are red and one-quarter as long again as the first ray. The male's pectoral spines also tend to turn upwards. The spines may be used as weapons during spawning and the author has observed in *H. littorale* that the upturned spine was used to transport pieces of floating Indian fern to the construction site of a nest.

Hoplosternum cats will withstand a wide temperature range (66–86°F; 19–30°C) and are not fussy about special water conditions. They possess an internal auxiliary breathing organ. Although they like planted tanks they will uproot plants and so an aquarium with rocks as hiding places can be used. Growth rate is rapid under good conditions, body lengths (snout to caudal peduncle) of 4 inches (*H. thoracatum*) and 5½ inches (*H. littorale*) being reached.

All kinds of foods are taken, the cats showing a preference for *Tubifex* and large-flake dried food; *Daphnia* is greedily taken.

Beware of

By LEN McCOURT

IT is a disturbing experience to be attacked by a fish, as I can vouch, for this is what happened to me when the male catfish (*Hoplosternum thoracatum*) was disturbed whilst guarding his eggs.

After an unsuccessful first attempt to spawn these fish in a 24 in. by 12 in. by 12 in. aquarium, I decided to try again, but this time under different conditions. A 36 in. by 12 in. by 15 in. fibre glass pond was thoroughly cleaned, a layer of well washed gravel was spread across the bottom and a few medium sized rocks were arranged at one end to form a cave to provide the female with a retreat. Then the pond was filled to a depth of 7 in. with ordinary tap water and the temperature raised to 75°F (24°C).

An ordinary domestic saucer was then suspended upside down, just below the surface of the water, by means of lead strips, bent to form clips and hung by plastic-covered wire to the frame of the tank above. Early that Friday morning the roe-filled female and the male (who had both been conditioned on large quantities of *Tubifex* and white worm) were introduced to the pond. That evening the male was observed to be blowing a nest of fine bubbles beneath the saucer (I have found that if the bubbles blown are large ones no spawning will take place).

The following morning (Saturday), on removing part of the cover glass, I thought the 4 ft. tank above was on its way down to meet my head!—the male had attacked me (and how!) thrashing the water wildly and drenching me, the walls, the floor and the wife. He kept

Pair of *Hoplosternum thoracatum* belonging to the author. The male is on the right, darker in colour and showing the longer and heavier first pectoral spine peculiar to large males of the callichthyid catfishes

The author was awarded the Kenneth Isaacs Challenge Trophy at the British Aquarists Festival 1966 for his catfish, whose breeding and rearing are described here, entered in the any variety egglaying breeders class.

the Cat!

(Gorton & Openshaw A.S.)

clearing the surface of the water to the region of the gills and grunting loudly like a piglet.

I left them alone until Saturday evening, when I decided to remove the female. This was easier said than done. On lifting the glass the male started with his terrible row. After a while the sudden outbursts were not so startling and I ventured to remove the cover glasses. The male repeatedly jumped at me and splashed and grunted but the female was nowhere to be seen. On removing the rocks I found her half buried in the gravel with her fins in a sorry state. She was removed to her peevious home and the male left to protest. By this time it was obvious the male was protecting something.

A Saucer of Eggs

On Sunday morning I decided to remove him and to inspect my efforts. Again I removed the cover glass and he promptly jumped out and went off across the floor, flapping and grunting and there I left him for a quarter of an hour until he decided to quieten down, and then put him in his old tank. (Provided that the room temperature is satisfactory and conditions are not too dry these fish can live for many hours out of water.)

Upon lifting the inverted saucer I found approximately 500 yellow eggs, each about ¼ in. in diameter, stuck and laid in rows, cichlid fashion, over the inside of the saucer and covered with fine bubbles. From this I assumed that the spawning had taken place during the hours of darkness. At this stage a 5% methylene blue solution was added to the water.

On the Monday the rocks and gravel were removed and the water was lowered from 7 in. to 3 in., the saucer, of course, being lowered as well. Light aeration from a fine airstone was arranged directly beneath the eggs. A water sample was taken and the test results were as follows: pH 7·6; hardness (German) D.H. 5·37. Poisonous metals: lead 0·2%; zinc, trace; calcium carbonate 0·23 p.p.m.; phosphate, 0·53 p.p.m.; methylene blue present. Remarks: soft, alkaline.

On Tuesday the eggs were checked and the embryos were seen to move, and no eggs were seen to be showing fungus. The temperature was 78°F (25°C). By Wednesday the embryos were much larger and more lively in movements; the aeration was slightly increased and late in the evening it was noticed that a number of eggs had dropped to the pale blue bottom of the pond and could be plainly seen. A 25 watt lamp was left burning continuously from this time onwards (this proved to be a big mistake). On Thursday morning a few fry were wriggling on the bottom and by the evening about half the eggs had hatched.

Friday morning found a small number free-swimming, or should I say 'waggling', along the bottom; the remainder of the unhatched eggs (about 100) were covered in fungus under the saucer (the light may have done this). By the evening the remaining fry were free-swimming and estimated to be between 350 and 400 in number. All the apparatus was removed and the first food for the largish fry was prepared (micro worm and very fine dry food). Also, one-third of the water was replaced.

On Saturday the fry appeared to be all right but did not move around a great deal. On examination under magnification, the fry were found to be well formed with speckled body and fins and also a large amount of red colouring in the body. The pectoral fins were very large and well developed for fry of this size.

On Sunday (the ninth day after spawning) the fry appeared to be in good condition and none seemed to have been lost. A small amount of micro worm was given but none appeared to be taken. Monday found the fry much improved. They seemed to be twice the size they were when first free-swimming. Their colour showed up well and the speckled markings were clearly defined. The barbels were long and prominent and the fry resembled the parent fish strongly, despite their small size. They were continually grubbing on the bottom and appeared to be feeding well on micro worm. There was no sign of the auxiliary breathing organ.

Light and Feeding

Tuesday brought the first upset. Almost two-thirds of the fry were found to have died, although this left a good number to be raised. The cause of this, I think, was the light being left on continuously, which discouraged the young from grubbing for food. I have found since that they eat much better when kept in the dark or in a very subdued light. Huge quantities of micro worm and a little, very fine, dry food are taken at this stage.

At 4 weeks the fry were ¾ in. long and they had to be separated as some tended to be bullies and take all the food, thus leaving a number of weaklings. At 8 weeks, they were very attractive little fish approximately 1¼ in. long. Between the eighth and ninth weeks, the labyrinth organ developed. From this time the air temperature above the water surface must be kept close to that of the water or fatalities will occur.

Thanks are given to Jim Kelly for the water test and to Eric Price for the photography.

Tell it to the Marines!

This tropical marine home aquarium is owned by Mr G. Winser of Peckham, London S.E.15, who received the runner-up prize (£2) for the 35 mm. colour transparency entered in Category II of PFM's Photo Competition

By JIM KELLY

HAS it never struck you as strange that in a country like Great Britain where nobody lives much more than 50 miles from the sea the keeping of marine species has been the one branch of the fish hobby that has never seemed to gain ground?

I realise some aquarists do keep marine tanks and make a successful job of it, but despite the pressure brought to bear upon hobbyists in these islands by outside sources some years ago, marine fish-keepers are still only slightly more numerous than those members of the human rate who have orbited the earth!

Having keep marine species since the last war it is surprising to me to hear visitors, when seeing this sort of tank in a home for the first time, express amazement as if by keeping marines we are something apart.

Consider the attractions of this branch of the hobby. A glance at the wonderful coloured illustrations in any book devoted to piscatorial activities will soon convince even the most hardened sceptic that for colour and sheer variety nothing surpasses marine fishes, yet conversations with aquarists from Lands End to John O'Groats will show you that even with so many good text-books on the market aquarists still speak of keeping saltwater fishes as they do of a manned landing on the moon!

Breaking Through

Probably the finger of blame can be pointed at the widespread belief that special equipment and specially constructed tanks are necessary; the destructive powers of seawater on metal are regarded as some demon that should never be allowed loose in one's fish house. What rot!

It strikes me as a situation rather like the '4 minute mile'. For years sportsmen and those who study their activities said that man was not capable of running one thousand seven hundred and sixty yards in 4 minutes; each attempt was defeated by the merest fraction of time, and it became a psychosomatic block in the minds of our runners.

Then one day the limit was broken. Almost immediately the shackles on the minds of sportsmen were off and soon many were to emulate the feat. The 4 minute mile was beaten.

This is what I feel will happen to marine fish-keeping once our minds realise that it isn't impossible and doesn't take a fortune in equipment.

The newly inaugurated Marine Aquatic (Study) Society should prove to be the key to unlocking most of these prejudices. Under the leadership of experienced aquarists like J. V. Morrice and G. H. Jennings, this group should be a great help to would-be enthusiasts.

For those still unconvinced let me give an account of our own experiences. Five years ago, just to prove that even the familiar angle-iron tank, complete with plate glass, was no drawback, we took one and painted the inside seams and underneath the top angle iron with two coats of the black asphaltum solution sold in pet shops as aquarium sealer. Each coat was allowed to set for 24 hours.

We filled it with sea water, not the filthy stuff found round our shores but beautiful clean and clear water brought from the Bay of Biscay (this can be purchased quite cheaply from Marine Biological Institutes found scattered round our shores).

For decoration we used well washed silver sand and brought some of our precous pieces of coral out of storage. Connecting up a large external filter, we allowed the

water to circulate for a week before we introduced any occupants; then we added colour and movement in the shape of six clown fish (*Amphiprion percula*).

At that time, a well-known figure in the hobby who enquired about this newly set-up tank gave us 3 months' life expectancy for the fish: 'The paint will break down', he remarked, 'and allow the sea water to attack the iron frame beneath . . . you'll see!'.

Twelve months later this still hadn't happened and the success of the venture proved a constant embarrassment to our friend on his visits to our home.

On my tour in America I saw marine set-ups gracing the homes of ordinary fish-keepers and their society shows boasted classes devoted to these species.

With the promise of cheaper stainless-steel tanks on the British scene, coupled with the appearance of all-glass tanks, fish-keepers will soon have plenty of containers other than angle-iron tanks at their command.

A Few Tips

If you transport sea water use glass or plastic containers, no metals. Filter your water well and don't be in too much of a rush to introduce fish until the tank has settled down.

It doesn't matter much what fish you decided to start with; probably your pocket book will decide that, but whatever species you choose, choose just a few and do find out what environment they like, whether they need a shelter provided or not.

Feed sparingly. We fed with sea foods such as mussels, well washed and chopped up. Siphon off any uneaten detritus after feeding; food left in the tank will foul a marine set-up very quickly.

Who knows, once we break down the barriers one may hear the remark, at our shows, 'Tell it to the marines'—and they will mean it!

by ARPEE

THE beginner to aquarium keeping may have one or more of several well-known motives when he buys his first tank, but I wonder how often the prospect of making a little money from the hobby really tips the balance? There is little doubt that, given the resources of a fish house and a good local market, the amateur can turn into a professional of sorts quite rapidly, but it is highly unlikely that his professionalism will be of a full-time nature.

There was the time when almost any dealer would buy good surplus fish, even livebearers, but nowadays a lot depends on where you live and what the policy of your retailer happens to be. The beginner should, I think, appreciate quite definitely that he is never likely to make much of a profit from the hobby, even if he can keep a good 'line' going, but there is no reason at all why he should not break even or simply cover his power bill by disposing of marketable surplus fish or plants.

Certainly, do not assume that your local retailer is going to put the red carpet out for you, simply because you have a dozen or so flames to pass on, though no doubt he will offer you a fair price for them if he is on the short side. The would-be breeder is strongly advised to ask a retailer within easy travelling distance whether he wishes to buy surplus stock, and if so, what sort.

The commoner fish generally seem to be most acceptable, as they have a ready market, but smaller quantities of the less obvious ones will often be snapped up, provided, of course, that you give the purchaser due notice. Failure to keep in fairly regular touch with the retailer will often bring about misunderstandings, so please remember that the onus is on you to take the initiative, as he usually has more than enough problems on his plate already, and can hardly be expected to be as awestruck by your breeding prowess as are your chums at the Club.

Given a bit of understanding, there is no reason why you should not do occasional business in a mutually satisfactory manner. You will be a little shocked at the prices offered for some of your best stuff, but you will usually get perfectly fair treatment, and if you recoup a quarter of the retail price, you haven't done so badly. I won't labour the issue of dealer's margins, about which I know little, but just tot up actual, visible, losses after a walk round almost any retailer's, and multiply that figure by 365 to see what sort of hole is made in that business each year by wastage for which he gets no compensation, and you will get some idea why you get only sixpence or so for those half-grown zebras.

If you want to 'go commercial', try breeding and selling white worms or micro; I imagine this would be a highly distasteful undertaking, so I very willingly settle for a system by which I dispose of surplus stock purely for supporting and improving my fishkeeping. Just as soon as money becomes the most important feature in a hobby, so the enjoyment of it takes a plunge. My advice to beginners therefore is to learn your fishkeeping for the first 20 years, and to enjoy it for the next 20. After that, you shouldn't need the money anyway, but you will almost certainly have a few tanks of pretty good fish.

The living-room aquarist, who has to tailor his tanks to the décor, more often than not builds cases and frameworks around them, which often look worse than the tanks themselves if they are not executed with near-expert skill in joinery. It is a great pity, certainly, to have to cover up those very attractive stainless steel framed tanks, or any similar ones which were designed

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Club News

MEMBERS of **NOTTINGHAM & D. A.S.** were delighted to have Mr R. E. Legge, curator at Belle Vue, Manchester, as the guest speaker at their October general meeting. Throughout the evening Mr Legge held his audience spellbound with accounts of his experience as a naturalist, both 'fishy' and otherwise. Mr Oldham gave a vote of thanks to the speaker for one of the most interesting lectures the club had heard and the entire meeting endorsed the hope that it would not be very long before they had the pleasure of being entertained by him again.

Results of the table show were: Goldfish: 1, Mr C. Hill; 2, Mr K. Riley; 3, Mr F. Newman. A.o.v. coldwater: 1, Mr C. Hill; 2, Mr K. Riley; 3, Mr A. Goodliffe. Home aquaria competition: 1, Mrs Bulleyment; 2, Mrs Goodliffe; 3, Mr Bulleyment. The winner of the raffle was Mr Pole, a visitor from Leicester A.S., and Mr Richardson won the second prize.

'BOTTLE' shows are proving very popular with members of **BASINGSTOKE & D. A.S.** both home and away. A very pleasant social evening was spent at the HIGH WYCOMBE club premises at which the contest was won by the host club. A Three Counties Meeting put on by READING A.S. at Shinfield resulted in Bracknell obtaining 86 points, Reading 83½, Basingstoke 78½ and Didcot 52. At club meetings bottle show results have been:

Louch or botia: 1, Mr E. Leavy (lace loach); 2, Mr T. Errey (red-tailed black shark); 3, Mr J. Godliman (sucking loach). Any variety tropical: 1, Mr D. Biddly (red-tailed black shark); 2, Mr A. Marshall (*P. Arcbensis*); 3, Mr L. Lovegrove (Australian rainbow). Minnow or rasbora: 1, Mr A. Marshall (scissor tail); 2, Mr T. Errey (firetail rasbora); 3, Mr L. Lovegrove (harlequin). A.o.v.: 1, Mr E. Leavy (lace gourami); 2, Mr T. Errey (pearl danio); 3, Mr R. Biddly (blue platy).

The club has recently moved to new premises at The White Hart, Worting, Basingstoke, but meeting nights are unchanged on the second and fourth Friday of each month.

SECRETARY Mr E. Seal of **TAMWORTH & D. A.S.** writes: 'At the November general meeting members of the club were entertained with a slide show produced by Highland Water Gardens, Rickmansworth, Herts. The loan of this show is free and worth any society's viewing time. Later during the evening the first issue of books from the newly formed library was made to members. Our first librarian is Mr Les Hand and it is hoped to spend £10 on books every year. Refreshments were supplied at a small fee by the society and the evening was quite a success'.

DUDLEY & D. A.S. held their annual general meeting and prize distribution at their headquarters, Dudley Zoo Aquarium, at the beginning of November when Mr Devison presented the following awards: Highest points shield to be held for 6 months each, Mr D. Frost and Mr J. Vickery; Arden trophy for best fish, Mr J. Vickery; The Rothin shield for highest number of novice points and Dudley Aquatic award for best novice fish, Mrs B. Payne.

Class winners were as follows: Judge your own and danios, Mr N. Newman; furnished aquaria, rasboras, plants, livebearers, Mr D. Frost; exotic coldwater, characins, Mr J. Foden; British native, guppy female, barbs, breeders livebearers, Mr G. Rothin; guppy male, Mrs J. Croft; novice guppy male, novice guppy female, Mr G. Northall; loaches, catfish, anabantids, a.o.v., Mr J. Vickery; cichlids, breeders egglayers, Mr A. Edwards; novice livebearers, Mrs B. Payne.

Officers elected were: chairman, Mr J. Vickery; secretary, Mr R. F. C. Hadley; treasurer, Mr S. Croft; show secretary, Mr D. Frost; assistant show secretary, Mr A. Roberts; librarian, Mrs J. Croft; publicity officer, Mr N. H. Newman; committee, Mr J. Foden, Mr D. Dean, Mrs G. Smith and Mrs J. Newman.

AT the 13th annual general meeting of **YEOVIL & D. A.S.,** Mr D. S. Langdon, a keen and active member since the society was formed, was elected president. Other officers elected were: chairman, Mr T. C. Perry; vice chairman, Mr M. Enticott; treasurer, Mr C. Bushell; secretary, Mr A. Nicholls; committee: Mr D. Chafer, Mr H. Dodd, Mr M. Hulbert, Mr D. Phinn, Mr W. Reeves, Mr W. Watt.

The retiring secretary, Mr T. C. Perry, reported that the society had completed a very successful year, partly due to the ever-increasing interest in fishkeeping in the Yeovil area. The treasurer reported the financial position to be as sound as ever; and during the year the society had had great success in open shows, the most recent being at the Bristol Open Show where the society won the Capaldi Cup for the best furnished aquaria (once again set up by Mr D. Silver) and the George Harper Cup for the best pond and river fish (won by Mr G. Gillard exhibiting a tench). Other awards made to club members at Bristol had been: Mr W. Reeves, 2nd, goldfish; Mr N. Stainer, 2nd, fighters; Mr T. Perry, 2nd, catfish breeders; Mr D. N. Phinn, 2nd, cichlids; Mr G. Gillard, 2nd, angels; Mr N. Wright, 3rd, guppies breeders; Mr C. Bushell, 2nd and 3rd, mollies. Mr D. Langdon and Mr T. Sharp received commended awards.

The club's November meeting took the form of a fish show (male guppies for tropical fishkeepers and a team of four fish bred in 1966 for the coldwater section). Results were: Guppy winners (judged by Mr D. S. Langdon): 1 and 3, Mr A. Nicholls; 2, Mr D. Phinn; 4, Mr N. H. Wright. Breeders class (judged by Mr M. Enticott): 1 and 2, Mr V. Collins (fantails); 3, Mr D. S. Langdon (shubunkin).

ENTHUSIASM of members of the **SOUTHEND, LEIGH & D. A.S.** was praised by the president at their recent annual general meeting. Officers elected for the coming year were: president, Mr A. J. Mason; vice-president, Mr V. C. Pickett; secretary, Mr M. J. Willis (17 Arundel Gardens, Westcliff-on-Sea); treasurer, Mr D. M. Cheswright; librarian, Mr Noble; magazine editor, Mr P. F. Capon; committee members, Mr J. Baron, Mr T. King, Mr C. Ward. An unusual office falls to the lot of Mr S. Norris —that of 'Member with special responsibility for welcoming newcomers'. What an excellent idea to have such an officer! New members can be really sure of a warm welcome at the meetings of the club held on the first and third Tuesday of each

G.S.G.B. Convention

Successful Bristol members (left to right) Mr L. G. Emery, Mr H. T. Jago and Mr V. Capaldi with Mr M. D. Cluse (vice-president of the G.S.G.B.)

THE pleasant appearance of the new plastic tanks used at the **GOLDFISH SOCIETY OF GREAT BRITAIN's** 1966 Convention was but one facet contributing to the enjoyable afternoon and evening spent by members and guests at this show. Judges of the 98 entries were Mr W. Wilson, Captain L. C. Betts and Mr R. Esson and they had no easy task, particularly when it came to judging between 35 really excellent singletails. Mr Wilson reported that fantails were a strong class and the winner a superb fish of fine colour, showing that good colour can be obtained on a double-tailed fish. The other classes were represented but not in such large numbers although the common goldfish class was quite strong and had some nice fishes in it. Celestials, bubble-eyes and bramble-head varieties would seem to be quietly gaining a following. The auction was handled by Captain L. C. Betts and many good quality fish changed hands. During the afternoon Mr N. Bennet gave an illustrated talk on aquatic plants and lillies with some really magnificent transparencies.

Details of placings were:

Singletails, 25 entries: 1, Mr L. G. Emery; 2 and 3, Miss D. Morris; Twintails, 11 entries: 1, Mr J. Livale; 2 and 3, Mr S. T. Tibble. Globe-eyes, 12 entries: 1, Mr D. Dudley; 2, Mr P. R. Whittington; 3, Mr S. T. Tibble. Bramble-heads, 7 entries: 1, Miss R. Berger; 2, Mr W. B. Iles; 3, Mr D. Dudley. Celestials, 3 entries: 1 and 2, Mr L. G. Emery; 3, Mr G. Fern. Bubble-eyes, 2 entries: 1, Mr W. Leach. Pearl scales, 1 entry: 1, Mr M. D. Cluse. Orandas, 7 entries: 1, Mr V. Capaldi; 2, Mr J. Rankin. Fantails, 19 entries: 1, Mr G. Fern; 2, Mr B. V. Herbert; 3, Mr A. R. Sutton. Common goldfish and London shubunkins, 11 entries: 1 and 2, Mr H. G Berger; 3, Mr G. King.

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month at the Liberal Hall, Clarence Road, Southend-on-Sea.

On the same evening as the annual general meeting, two table shows were held. Best fish of the year: 1, Mr A. J. Mason (flying fox); 2, Mr B. Dunn (cherry barb); 3, Mr C. Ward (scissortail); 4, Mr V. C. Pickett (stoliczra barb). Breeders egglayers: 1, Mr B. Dunn (*rosaceus*); 2, Mr B. Dunn (*Nothobranchius guenthori*); 3, Mr E. Thompson (rosy barb); 4, Mr P. F. Capon (ticto barb). Breeders livebearers: 1, Mr B. Dunn (guppy); 2, Mr D. M. Cheswright (platy).

At a previous meeting a table show was held for a furnished 'mini-tank', the idea for the show being derived from the article in PETFISH MONTHLY for September, 1966. The results were: 1, Mr E. Thompson; 2, Mr P. F. Capon; 3, Mr J. Baron; 4, Mr S. Norris.

MEMBERS of the **UXBRIDGE & D. A.S.** turned up in great strength to two recent meetings of the society. At one, Dr R. O. B. List gave an illustrated lecture on his experiences as judge at international shows in both East and West Germany. At this meeting, while the lecture was in progress, Mr Stewart judged the breeders class table show in which there were four entries in the livebearers and ten entries in the egg-layers class. Mr Brunton took the only prize in the former class, gaining 82 points with a good display of black swordtails. In the egglayers class, Mr Peters was first with 84 points for his rosy barbs, Mr F. Bunn taking second prize with thicklip gouramis (83½ pts) and third prize with *Aneotomus anotomus* (83 pts).

At the second meeting, Mr A. Boarder gave a most interesting lecture on cacti; members took along quite a number of specimens and the lecturer was able to explain the finer points of how to keep and successfully raise these plants.

Mr B. Baker, the assistant secretary, has had to resign from office because of business commitments, but the chairman thanked him for all his hard work on behalf of the club and expressed the hope that he would long continue as a member.

FINALS of the shield events held recently by **HOUNSLOW & D. A.S.** resulted in the following awards:

Livebearers: 1, Miss J. Chandler (albino swordtail, 73 pts); 2 and 3, Mr J. White (guppies, 72 and 71 pts). A.O.V.: 1, Mr A. Hastings (*Rasbora borapetensis*, 76 pts); 2, Mr J. Sweeney (*Calamoichthys calabaricus*, 74 pts); 3, Mr B. Abbott (red-finned shark, 73 pts). Catfish and loach: 1, Mr B. Boult (*C. aeneus*, 74 pts); 2, Master C. Walker (kuhli loach, 73 pts); 3, Mr J. Thorne (*C. myersi*, 72 pts). Labyrinths: 1, Mr J. Thorne (dwarf gourami, 77 pts); 2, Mr E. Sheppard (dwarf gourami, 75 pts); 3, Mr E. Parry (leeri gourami, 74½ pts). Characins: 1, Mr A. Hastings (red-nosed tetra, 77 pts); 2, Mr E. Sheppard (salmon discus, 73 pts); 3, Mr A. Hastings (cardinal tetra, 72 pts). Cichlids: 1, Mr B. Abbott (*Haplochromis wingati*, 74 pts); 2, Mr E. Parry (*C. severum*, 74 pts); 3, Mr J. Thorne (*A. ramirezi*, 73 pts). Coldwater: 1 and 2, Mr A. Hastings (Bristol shubunkins, 78 and 75 pts); 3, Mr B. Abbott (fantails, 73 pts). Barbs: 1 and 2, Mr D. Love (nigger barbs, 76 and 74 pts); 3, Mr P. Cairs (rosy barbs, 74 pts).

Pairs: 1, Miss J. Chandler (leeri gouramis, 154 pts); 2, Mr E. Parry (red-eyed red swords, 149 pts); 3, Mr E. Sheppard (tiger barbs, 148 pts). Breeders egglayers: 1 and

2, Mr E. Parry (sparkling gourami and lavri gourami, 74 and 73 pts). Breeders livebearers: 1, Mr E. Parry (guppies, 77 pts). Best fish of the year, Mr J. Thorne (dwarf gourami).

BEST fish in show at the **THURROCK A.C.** annual show was a blind cave tetra entered by Mr D. Durrant and awarded 92 points. Altogether there were 126 entries, judged by Mr J. Stewart, F.B.A.S. show judge. Details of the results are:

Guppies: 1 and 2, Mr P. O'Bryan (half black, 84 and 81 pts); 3, Mr D. Durrant (scarftail, 80 pts). Mollies: 1, Mr B. Barber (sailfin mollie, 86 pts); 2, Mr D. Durrant (liberty mollie, 85 pts); 3, Mr E. Nicoll (lyretail, 84 pts). Platys: 1 and 3, Mr B. Barber (festival platy, 86 and 84 pts); 2, Mr D. Durrant (yellow wag platy, 85 pts). Swordtails: 1, Mr J. Hartlebury (black, 85 pts); 2, Mr D. Durrant (red, 83 pts); 3, Mr G. Rowe (tuxedo, 81 pts). Fighters: 1, 2 and 3: Mr D. Durrant (red fighters male, 88 and 87 pts; red fighter female, 86 pts). Gouramis: 1, Mr B. Barber (lavri, 88 pts); 2, Mr E. Nicoll (moonlight, 86 pts); 3, Mr S. Hendle (moonlight, 85 pts). Minnows and rasboras: 1, Mr B. Barber (White Cloud mountain minnow, 90 pts); 2, Mr J. Hartlebury (White Cloud, 88 pts); 3, Mr E. Nicoll (*Rasbora elegans*, 87 pts). Barbs: 1 and 2, Mr S. Hendle (rosy barb, 86 and 85 pts); 3, Mr G. Rowe (rosy barb, 81 pts). Catfish and loaches: 1, Mr E. Nicoll (*C. aeneus*, 85 pts); 2, Mr D. Durrant (*C. aeneus*, 84 pts); 3, Mr J. Hartlebury (*C. myersi*, 83 pts). Characins: 1, Mr D. Durrant (blind cave tetra, 92 pts); 2, Mr S. Hendle (black widow, 89 pts); 3, Mr E. Nicoll (pencil fish, 87 pts). A.O.V.: 1, Mr S. Hendle (*Pterolebias longipinnis*, 87 pts); 2, Mr E. Nicoll (Australian rainbow, 86 pts); 3, Mr S. Hendle (red-tailed black shark, 85 pts). Coldwater: 1 and 2, Mr B. Barber (common goldfish, 87 pts; shubunkin, 84 pts); 3, Mr S. Hendle (common goldfish, 81 pts).

Furnished aquaria: 1, Mr S. Hendle (78 pts); 2, Mr K. Appleyard (73 pts); 3, Mrs B. Nicholls (72 pts); 4, Mr B. Barber (68 pts).

ANYONE interested in fishkeeping and aquatic life can be sure of a very warm welcome at the meetings of the **ILFORD & D. A. & P. S.**, where members enjoy a varied programme. Recent meetings have included a sale of fish and plants and a visual quiz prepared by Mr and Mrs Ruth and Mr Brill that provided a very interesting evening with a wide selection of items for identification and classification including a first-class selection of live fish and plants and a good assortment of minerals and coloured illustrations. Mr Sampson attained the highest number of points. The club's annual home aquarium competition was won this year by Mr J. Hattam (2, Mr J. Hattam; 3, Mr L. Smith; 4, Mr Robinson).

At the society's annual all-classes table show, Mr Harry Berger, show secretary, took most of the awards in the coldwater section, and Mr John Hattam made almost a 'clean sweep' with his guppies at the monthly table show, setting a high standard for members to follow when the new show season starts in March 1967. Details of these results were: Bristol shubunkins: 1, 3 and 4, Mr H. Berger; 2, Mr Cook. Female guppies: 1, 2 and 3, Mr Hattam; 4, Mr Sampson. Male guppies: 1, 2, 3 and 4, Mr Hattam. All classes table show: Best eggLayer: Mr Berger (veiltail goldfish); best livebearer: Mr Hattam (*Platy variatus*); best junior entry: Mr Sampson (common goldfish).

Results of the October table show were: Any variety twintail goldfish: 1, Mr H. Berger (fantail); 2, Mr H. Berger (black moor); 3, Mr W. Cook (fantail); 4, Mr H. Berger (veiltail). Breeders class tropical and coldwater: 1, Mr Sampson (thick-lipped gouramis); 2, Mr Cook (fantail goldfish); 3, Mr Robinson (Egyptian mouthbreeders); 4, Mr Sampson (zebras).

On Monday, 9th January, the annual prizegiving and report by the show secretary will take place. In addition the Ilford Cine Club will show their film of the Arts and Crafts Exhibition held in April 1966 in which the society took part. Further information can be obtained from the secretary, Mr R. Ruth, 13 Dunkeld Road, Dagenham.

HEYWOOD & D. A.S. have been enjoying a most energetic and resourceful year. They have capped the success of their second open show this year (when there were well over 200 entries from all over the north and several innovations, such as the provision of hot meals, which proved very popular) with a Junior Open Fish Show for children between 8 and 16 years old held by the Junior section of the club. This is probably the first time in this country that there has been a show catering for these ages only and it proved to be such a success that it is now hoped to make it an annual event. It was originally intended that there should be only four classes, but owing to the very large response these sections had to be sub-divided to give a final total of 17 categories. The awards, listed below, went to children from all over the north west of the country.

8–11 year olds. Swordtails: 1 and 2, S. Birch; 3, A. Wood. A.o.v. livebearers: 1, J. O'Brien; 2, A. Wood; 3, S. Birch. Barbs: 1 and 2, S. Birch; 3, S. Logan. A.o.v. egglayers: 1, T. Preston; 2, A. Wood; 3, S. Logan. Coldwater: 1, 2 and 3, S. Birch. Section winner: J. O'Brian.

11–13 year olds. Gouramis: 1 and 2, P. Hodgkinson; 3, T. Harris. A.o.v. tropical: 1 and 2, P. Hodgkinson; 3, T. Harris. Section winner: P. Hodgkinson.

13–16 year olds. Platys: 1, A. Wildshaw; 2 and 3, W. Booth. Guppies: 1, K. Ribchester; 2, A. England; 3, P. Wood. A.o.v. livebearers: 1, W. Booth; 2 and 3, K. Ribchester. Catfish: 1 and 2, W. Booth; 3, L. Wildshaw. White Cloud minnows: 1, 2 and 3, L. Wildshaw. Gouramis: 1, A. Middleton; 2, A. England; 3, S. Hardman. Barbs: 1, A. Johnson; 2, P. Wood; 3, W. Booth. A.o.v. egglayers: 1, E. Barlow; 2, A. Johnson; 3, P. Wood. Coldwater: 1, 2 and 3: K. Ribchester. Section winner: W. Booth.

Mr J. Collins, the well-known F.N.A.S. judge, who officiated, commented on the very high standard shown. The novelty class, which was open to all children, was won by Master T. Gilder with a terrapin.

In Brief . . .

. . . . OFFICERS of the **ROMFORD & BEACONTREE A.S.** for 1966–67 are: chairman, Mr H. C. Heath; president and treasurer, Mr A. J. Wilson; secretary, Mrs K. Heath (336 Mawney Road, Romford, Essex) The Society also announce a change of meeting time and place. As from the 24th November 1966 they have been meeting at the Mawney Road Baths (Large Hall) at 7.45 p.m. every other Thursday.

. . . . NEWS received from the **LONG BEACH AQUARIUM SOCIETY**, California, U.S.A. might cause envy in some hearts—a club membership of 1306 with 117 attendances at the last meeting. There seems to be very great co-operation between traders and club, with the publication packed with advertisements and a 'Prize Table' stacked with free gifts donated by the same advertisers.

. . . . FISH enthusiasts and prospective fishkeepers living in the Roehampton, Putney, Barnes, Richmond or Wandsworth areas of London will receive a very warm welcome from members of the **ROEHAMPTON A.S.** at their meetings held every Wednesday fortnight at the Roehampton Estate Tenants Association Club in Pleasance Road, Putney. The club secretary, Mrs V. Sinden, has had to resign through ill-health to everyone's deep regret and her place has been filled by

Mr J. A. Waller, to whom all enquiries should be addressed at: 39 Bramley House, Alton Estate, London, S.W.15.

. . . . **LYTHAM A.S.** announce with great pleasure that Mr Jim Kelly has consented to become their first president. At their first annual general meeting officers elected were: chairman, Mr David Baker; general secretary, Mr William C. Matthews (42 Dodney Drive, Lea, Nr Preston, Lancs.); show secretary, Mr Donald Thompson; assistant show secretary, Mr Eric Willet; treasurer, Mrs Myra Matthews.

. . . . FILMS of club outings during the past year presented by Messrs Bennett, Deacon and Fox made a most enjoyable programme for members of **RUGBY & D. A.S.** At this meeting, results of the table show were: Catfish and louch: 1, Mr R. Fox; 2 and 3, Mr R. Deacon. Novices, any fish: 1 and 2, Mr K. Mullis; 3, Mr T. Wood. Breeders livebearers: 1 and 4, Mrs O. Fox; 2 and 3, Mrs R. F. Woolterton. The fish of the month was a *Brachydanio rerio* owned by Mr N. Bowen (86 pts).

. . . . AT the last table show of the season for **MERSEYSIDE A.S.** Mr Fred Mulla was awarded the annual trophy for the best performance in table shows throughout the year. The society's next meeting is the A.G.M. on 9th January. All aquarists are invited to attend at 8 p.m. in the Montrose Athletic and Social Club, 5, Richmond Terrace, Liverpool, 6 (where meetings are held on alternate Mondays). The society will also be pleased to exchange monthly bulletins with any other society. Please send magazines to the News Editor, Mr Tom Wayles, Jnr., 31 Newton Park Road, Newton, West Kirby, Cheshire.

. . . . RESULTS in the second 'leg' of the home furnished aquaria competition of **NEWPORT A.S.** recently judged by Mr Peter Battista (show secretary of Cardiff A.S. and a class 'B' judge of the F.B.A.S.) were: Tanks of 2 ft. length and under: 1 and 3, Mr L. J. Bannerman; 2, Mr J. T. Burgwin; 4, Mr H. J. Wall. Tanks over 2 ft: 1 and 3, Mr H. J. Wall; 2, Mr J. O'Dwyer; 4, Mr P. Tidball. The fourth annual presentation evening of the society (inclusive of a buffet meal) will be held at Stow Park Hotel, Newport on Saturday, 28th January. Further details from Mr J. J. Parry, 45 Western Drive, Gabalfa, Cardiff (Tel: 66573).

. . . . HOME aquarium competition results for **LEAMINGTON A.S.** were 1, Mrs J. K. Smith (84 pts); 2, Mr D. V. Lenton (83 pts); 3, Mr F. Underwood (79 pts); 4, Mr D. G. D. Lucas (78 pts). The table show held for breeders teams produced a really good number of entries and cards were awarded as follows: Egglayers: 1, Mr K. Russell (nigger barbs); 2, Mr F. Underwood (rosy barbs); 3, Master D. Beard (zebras); 4, Mrs J. K. Smith (rosy barbs). Livebearers: 1, Mr F. Underwood (guppies); 2, Mr J. Beard (green swords); 3, Mrs R. V. Underwood (wagtail platys); 4, Master D. Beard (black mollies). So watch out competitors in the M.A.L!

. . . . **ABERBOROUGH & D. A.S.** report that in 9 months their Corresponding Members number over 40 and by the time this goes to print club membership will have reached over 100. A bumper-sized Bulletin is planned next year with sixteen pages including six full pages of ads.

Dates for Your Diary

5th March 1967. **FEDERATION OF SCOTTISH AQUARISTS SOCIETIES** March Convention. Templehall Secondary School, Kirkcaldy, when KIRKCALDY A. S. will be the host society.

7th May 1967. **ASSOCIATION OF YORKSHIRE AQUARIST SOCIETIES** Open Show, Hull (details awaited).

27th May 1967. **READING & D. A.S.** will be staging the 1967 THREE COUNTIES AQUARIST SHOW at The S.G.B. Social Club, Gas Lane, Reading. Benching from noon, Friday, 26th May. Further details and schedules available in due course from the show secretary: Mr C. Masters, 16 Morcombe Avenue, Caversham, Reading, Berks.

11th June. **LYTHAM A.S.** first Open Show at the Lowther Pavilion, Lytham.

15th October. **STONE A.S.** Open Show (provisional).

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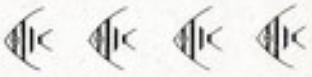
Personal Comment

Continued from page 327

with aesthetic appeal in mind. The greatest problem for the aquarist in installing them is how to disguise the wiring and tubing which most aquaria collect around themselves shortly after purchase. It will be found that plastic water or down-piping can be turned to the help of the aquarist in these circumstances, for a length of it, clipped or strapped to the aquarium stand, can be used as an attractive form of conduit; holes may be bored in it to bring pipes or wires out at the required levels, and the colour can, with luck, be selected to match the colour scheme of the room.

What influences your selection of a fish? I should be interested to have the views of readers on what motivates them in buying new fish. I am particularly interested in knowing how inmates for the community tank are selected, because I strongly suspect that there is too much on-the-spur-of-the-moment buying and not half enough inspired purchasing. It would be dull stuff indeed if no-one bought a fish unless he had read volumes on its antecedents first. Certainly, a bit more sensible buying would lower the mortality rate overnight, but I wonder how many aquarists work out a definite buying plan and really stick to it. I must admit to being influenced very much by the colour and gracefulness of a fish, but I try quite hard to think whether I need any more surface or bottom swimmers, to balance a tank disproportionately endowed with middle-water varieties. A feature which decidedly puts me off is fussiness, and for this reason no tiger barbs have been in my collection for years, and much as I admire the zebra, he has, at least for the time being, been relegated. I hope to develop this theme in future notes, and to attempt to record a number of proven selections of compatible fish which can be confidently recommended to the beginner.



Although I have only learnt of one fish noise amongst tropicals, and this is attributed to the croaking gourami, there is no doubt that the adult angel makes a curious noise—something between a croak and a cluck. At least, a pair which I possess performs this duet, and I wonder how widely this has been observed. It certainly seems to have avoided getting into print by the authorities I have consulted. It seems to occur, with some regularity, when the overhead tank light is turned out before we retire for the night. The sound is louder in the day or so before spawning; a visitor remarked on it the other day, and he was some 6 feet away from the tank!

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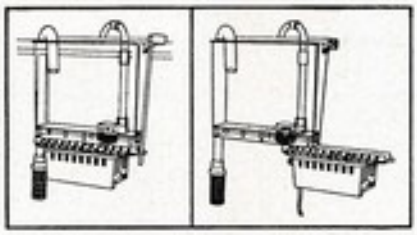

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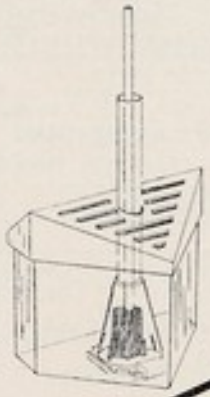

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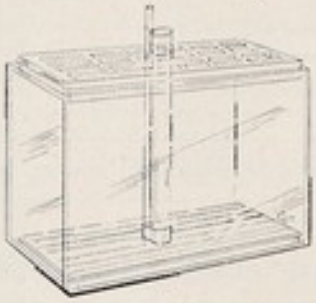

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