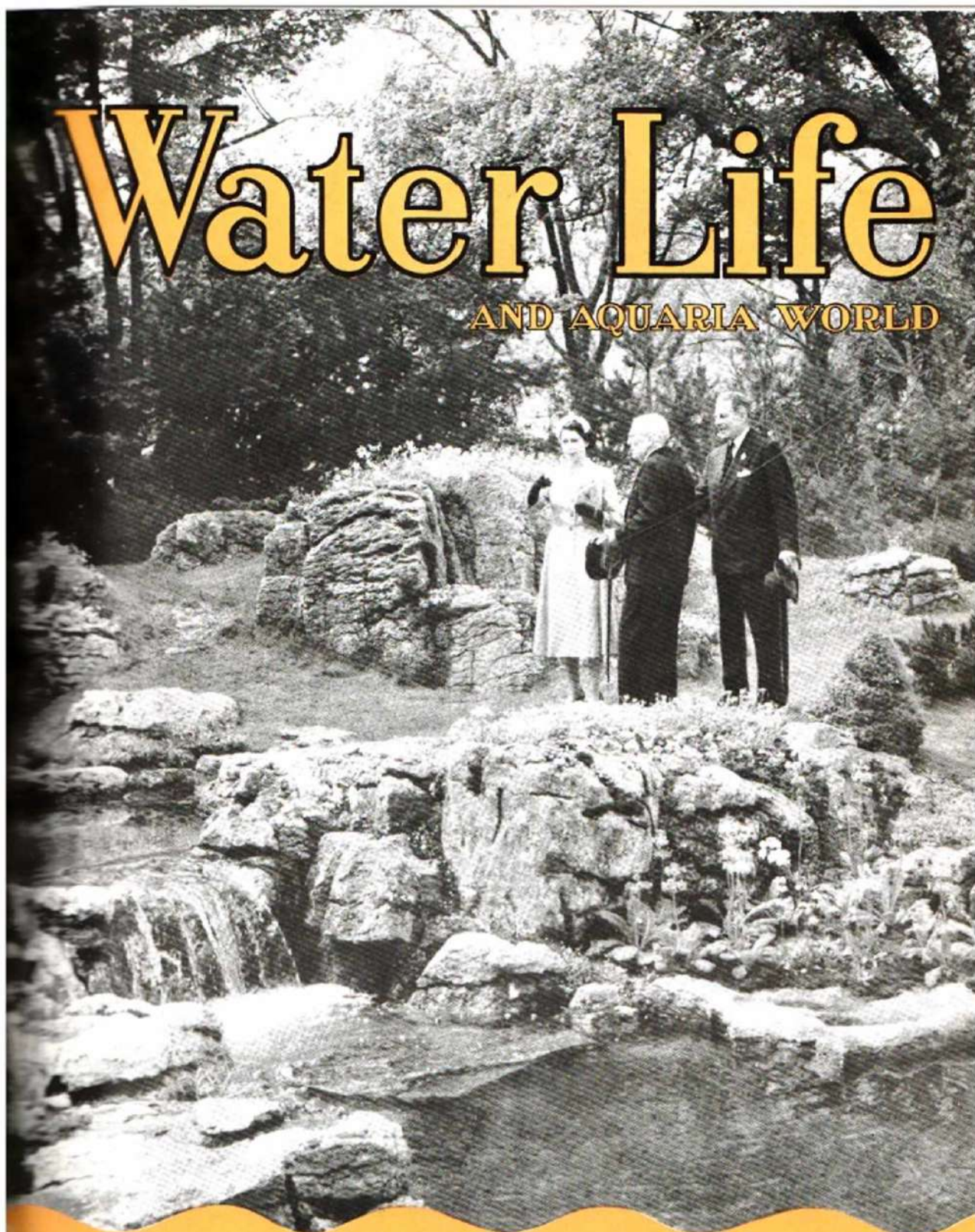


Water Life

AND AQUARIA WORLD



SEPTEMBER—OCTOBER, 1955

TWO SHILLINGS AND SIXPENCE

Water Life

AND AQUARIA WORLD

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FRONT COVER: ROYAL PATRONAGE.

Within the Royal Hospital grounds at Chelsea, South-west London, the Royal Horticultural Society stages the Chelsea Show annually. Invariably Royalty visit the event and this year's most distinguished visitor was H.M. the Queen seen inspecting Mr. C. Whitelegg's water garden. To the right is the Hon. David Bowes-Lyon, V.M.H., society President.

Photograph]

[Blippa

VOL. 10, No. 4 (New Issue)

AUGUST, 1955

EDITORIAL

Taking Stock

WHETHER we choose to keep tropical fish, have a preference for coldwater species, or dabble with both, once we get beyond the stage of just keeping a small collection and start encouraging them to breed, we have to re-assess our outlook. It quickly becomes necessary either to reduce the number of fish beginning to crowd our tanks and ponds or to increase our aquariums and enlarge the garden pool. More often than not we resort to the latter solution.

There must, however, always be a limit to the space we can devote to our fishes. How many of us add one more tank with increasing frequency until every room becomes a fishroom? Others, turning to their gardens, sacrifice flowerbeds and lawns to new ponds.

No home is truly complete without an indoor aquarium and a pond in the garden. If, however, domestic bliss is to be preserved and the task of looking after our fishes kept within reason we must not let the size of our stock get out of hand.

It is better to have one pond properly maintained than to possess several, none of which gladdens the eye. It is happier to restrict our tanks in number instead of crowding every odd corner. If we fail to control our enthusiasm, we find we cannot cope and then the hobby is no longer a pleasure.

Scales of Fishkeepers

The man or woman with one small drawing-room tank or a modest outdoor pool cannot, perhaps, be said to be an aquarist in the fullest sense of the word but he or she can keep a few fish in good condition. On the other hand, the individuals who undertake more than they can manage usually end up with untidy aquaria or ponds that bring no credit to their owner. The fishkeeper who remains with us year in and year out has, consciously or otherwise, a good idea of the number of fish that can be kept satisfactorily and rarely exceeds that number. If regular breeding is undertaken only the best specimens are retained and the establishment, whilst not allowed to grow too big, improves each year in quality.

Now is the time when many of us might review our position to advantage. If we have as our ambition simply the display of communities of fish in set-up tanks there is need for only one or two spare aquariums for use in an emergency. Should we wish our fish to breed and decide to show the best of them then a bigger set-up is required, but we should keep it down to reasonable proportions.

It is better to raise a few good fish from carefully selected stock than to get numerous inferior specimens requiring many aquaria or several ponds to hold them. Our advice to those who have begun to take on more than can be handled is to call a halt, carefully selecting the best specimens and restarting on a more moderate scale. They will then be able to say that they enjoy the hobby. Better do that than give up fishkeeping because they have let it become a drudgery.



Well-planted raised formal pond with central fountain surrounded by paving, a grass verge and symmetrical flower beds.

Diary of a Pondkeeper

Maximum Effects from Formal Gardens

By J. Stott

WHEN a garden is designed on ornamental lines, with terracing and a considerable amount of stone work employed, a pond of formal lines is ideal. Naturally, the construction should be carried out correctly and the immediate surround made appropriate to the setting. I notice, on looking back through these articles, that I have not said a great deal about the formal design. No doubt this is because I am more interested, merely from a personal point of view, in the informal arrangement, but I always appreciate formal ponds if they are of good design and have surrounds which provide the right setting for them.

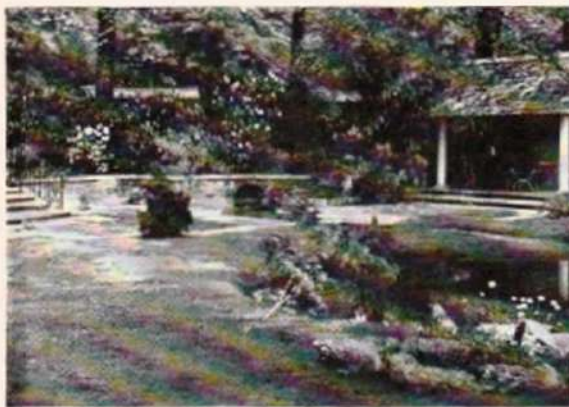
Plant with Care

In an attempt to keep to the strictly formal it is so easy to produce a stark and hard appearance and yet it is equally easy to overplant the adjacent area resulting in a fussy and "overdone" effect. Of course there are always personal preferences to be borne in mind and these influence precisely where the borderline lies when planning a formal pond, but anyone with an eye for design can tell immediately

when a design has "come off" and when just the right balance has been achieved between pond and surround.

I remember a pond I saw, just before the last war, when on a touring holiday in North Wales. It demonstrated how well rose beds and a formal pond look together if correctly planned. The pond was not large, approximately 8 ft. x 5 ft., and it was positioned in the centre of a sunken area, which was paved except for the rose beds and the four corner flower beds. The latter were obviously a means of providing variation to the scene by planting with different bedding plants each year or, perhaps, by seasonal planting. They contained a lovely display of antirrhinums at the time of my visit.

Two rustic garden seats, suitably placed in recesses, added charm to the scene and the flat stone top to the raised pond



Photographs] (WATER LIFE
This year's Chelsea Show. Left: Messrs. Ralph Hancock & Son's garden. Above: Messrs. Cheal & Sons' exhibit.

edge was sufficiently wide to offer seating at the pondside at a comfortable height. White and yellow Water-lilies were in bloom as well as Water Hawthorn.

While the triangular-shaped rose beds were at ground level as well as the paving, the corner beds were raised some 12-14 in. and were, approximately, half the height of the retaining wall around the sunken area. The diagram will show clearly the design, which produced a scene of attractive and clean appearance.

Frame for the Pond

When a ground level formal pond is used with a lawn surround, not only does the method of using narrow paving around the pond edges help to conceal the concrete, but it frames the pond and controls the grass, thus producing a clean edge. Such a pond, however, should, I feel, incorporate a bog trough either across the corners or at points along the sides so that a few tall-growing bog plants may be used to overcome the appearance of flatness which, without their aid, would be produced. For this purpose the more rampant growers should be avoided or, if they must be used, the greatest control exercised. If there should be too many of them, or if they are permitted to grow too densely, the desired effect is not achieved. *Butomus*, Reed Mace and lilies are some of the plants which play their part well for such a setting.

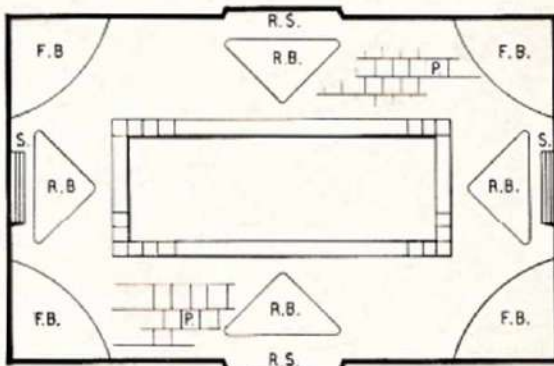
Use of Crazy Paving

A surround of crazy-paving can be made to look well, especially if pockets are incorporated to take plants producing a paved garden surround. To obtain the right effect, in my opinion, it is always advisable to avoid making too many pockets, which would result in overplanting. Allow the paving to predominate the surround. A few irregularly-shaped pockets here and there, planted with a careful selection of suitable subjects, generally produce the desired effect. Tall growing plants are best avoided and the pockets are best planted with those subjects usually referred to as carpeting plants. *Acaenas*, *Arenaria balearica*, *Cotula neptans*, *Dianthus arvernensis*, *Mimulus radicans*, *Raoulia australis*, *Silene alpestris*, *Thymus serpyllum*, *Potentilla verna nana*, *Sedum acre aureum*, *Sedum lydium*, *Viola cornuta* and *Veronica* are some of the best plants for this purpose. Where the area of paving is sufficiently large to permit their use one or two dwarf conifers placed at suitable points will be attractive and *Juniperus communis compressa* makes an ideal subject for this purpose.

On the edge of some of my paving I have had a grand display this Spring by a British wildling which responds well to a little care and attention. It is the Dog Violet and, if kept well under control, it makes a grand plant for the crevices between the paving stones. If given one or two feeds of weak liquid manure (cow dung) during March, and again

in late Autumn, the plant will provide large quantities of bloom in April and May—in fact mine were still flowering well in early June.

Those pondkeepers who are desirous of having a good show of blossoms are always planning or preparing for some season ahead and now that September is drawing near it is time to think again of the early Spring bulbs and corms. Thoughts turn to the possibility of making additions or, if they have not been used previously in the surround, of



Ideal formal pond surround described by the author. S—steps into sunken area. R.B.—rose beds. F.B.—corner flower beds. P.—paving between pond and beds. R.S.—rustic seats in recesses. The corner flower beds enable a change to be made in the flowering scheme and, with the paving and roses, provide a perfect foil for the pool.

making an introduction. Such subjects can be extremely helpful in providing early colour at the pondside.

This year has been a period of construction and re-organisation for me, as I took over a new residence last October, but I certainly intend to furnish a rock bank with early bulbs and corms. For this purpose I shall try some of those which are frequently overlooked. I think they deserve to be more widely used. This rock bank forms part of the background to a small informal pond which will offer a good setting for such a display.

Bulbs for the Rock Bank

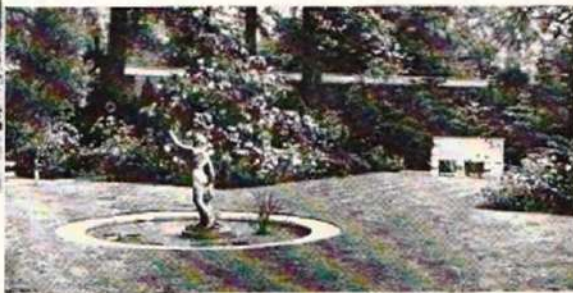
First on the list is *Milla uniflora* which flowers in March and has attractive grass-like foliage. It is hardy, grows to a height of six inches, and will suit the position I have scheduled for it. The flowers are lavender coloured with a dark blue stripe on each petal. *Chionodoxa Luciliae* is another which has flowers of bright blue with a clear white centre. Its height is about five inches and the plant appreciates a sheltered position. To go in close company with a few *Narcissus nanus* is *Puschkinia*, flowering in April, and, to provide a splash of brilliant red, is *Anemone fulgens*, planted in clusters.



Photographs]

[WATER LIFE

Two further formal gardens at Chelsea Show. Above: Contemporary design of Messrs. R. Wallace & Co. Right: Round pool and stone seat in Mr. Percy S. Cane's garden.



Inheritance in Fish (4)

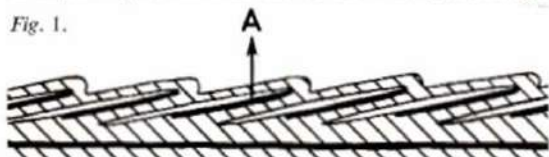
Appearance of Goldfish Varieties

Reflecting Tissue the Criterion when Assessing to which Group a Fish Belongs

By R. J. Affleck, M.Sc.

IN the last issue (p.119) mention was made of Albino fish. Although albinism is known in about half-a-dozen aquarium fish it is unknown in Goldfish. This is surprising as in the Goldfish we find a greater variation in form than that in any other animal. Dr. Myron Gordon and Dr. Haskins, who investigated albinism in Swordtails and Guppies respectively, noted that Albinos are not as virile as other varieties and so it is possible that Albinos may have arisen in a spawning of Goldfish only to die in the great struggle

Fig. 1.



for existence which normally takes place during the first month of their life. Keep looking, you Goldfish-breeders!

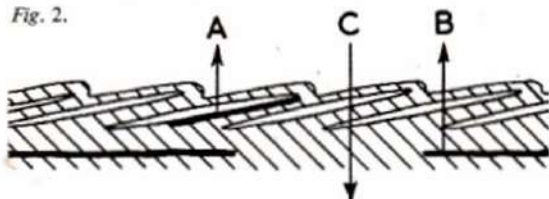
Several years ago pink coloured Goldfish, without shiny tissue beneath the scales, were called Albinos because they apparently lacked black pigment. However, further examination showed that the eyes had a normal amount of black pigment and, because of the lack of shiny, reflecting tissue around the pupil, their eyes appeared abnormally large and black.

We may note that even animals which are genetically Albinos sometimes have small amounts of black pigment. Some of my Albino Guppies are born with small amounts of black pigment in the eyes although the amount usually decreases soon after birth.

Incomplete Dominance

In examples so far discussed in this series, dominant genes have completely suppressed the action of the recessives and this type of action is the typical one. However, there are a very few cases where the dominant is only incompletely dominant over the recessive and an intermediate character results. The outstanding example of incomplete dominance occurs in Goldfish with a pair of genes concerned with reflecting tissue. The action of these genes had been incompletely understood by almost all Goldfish fanciers until the Goldfish

Fig. 2.



Society of Gt. Britain published its standards. Judging by some standards which have been published since 1950, the matter is still not appreciated by many people outside the G.S.G.B.

The wild-type Goldfish, which is an olive-grey in colour, is found in the rivers of China. In these fish all scales are transparent but beneath each one is a layer of reflecting

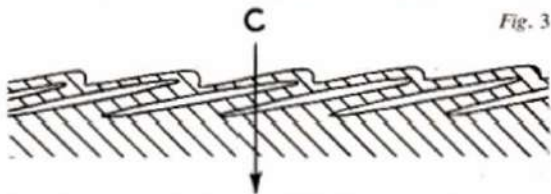
tissue and the scale with this tissue may be likened to a mirror—the glass being the scale and the "silvering," the reflecting tissue. The domesticated Goldfish with its bright orange colour is merely a colour variety of the wild-type fish. Many years after the orange coloured variety arose a new mutation appeared, reducing the amount of reflecting tissue.

Fig. 1 represents the distribution of reflecting tissue in a wild-type fish which has a maximum amount of this tissue. In this diagram the tissues of the fish are shaded; scales, which overlap one another, are white and reflecting tissue is black. The tissue just beneath the scales reflects light (A) and gives them a shiny or metallic appearance. Although there is a second layer of reflecting tissue deeper down in the body wall it is obvious that light from the outside does not normally reach this layer.

When the reflecting tissue is eliminated completely, light from the outside passes through the scale and other tissues and is not reflected back so the fish has a non-shiny or matt appearance (Fig. 3).

Between these two extreme types there is another, represented by Fig. 2, which has an intermediate amount of reflecting tissue. The tissue occurs very irregularly so that, although some regions may appear metallic (A), others will be matt (C). Where reflecting tissue is absent from the first

Fig. 3.



layer but present in the second the light which is reflected back (B) has a mother-of-pearl appearance. There are always some regions with this nacreous shine in these intermediate (Nacreous) fish.

The two extreme types (Metallic and Matt) are true breeding but the intermediate one is not, as may be seen from the following diagram.

P.1.	Metallic (tt) × Matt (TT)
Gametes	t t T T
F.1.	All Nacreous (Tt)
Gametes	T t T t
F.2.	1 Metallic (tt): 2 Nacreous (Tt): 1 Matt (TT)

I can imagine most readers saying that there seems little difficulty in understanding the differences between the groups—fish with a metallic shine all over are Metallic; those with no shine are Matt; while those with some places having a mother-of-pearl shine, are Nacreous. Except for the fact that some Matt fish do occasionally have small regions of shine, the task of distinguishing the groups is as easy as most readers imagine—when the above nomenclature is used.

Unfortunately, popular nomenclature is not only inaccurate but actually misleading. Readers will note that no mention has been made of colour when distinguishing the groups, as colours do not enter into the matter at all. Indeed, many

(Continued next page.)

Numerous Spawnings from Neon Tetras

L. Naylor, a Birmingham Aquarist, Discloses
His Methods with a Difficult Characin

WHEN I set up my first tropical tank in the early part of 1950 Neon Tetras were in the region of £1 each and I used to gaze from afar at these lovely little fishes. I could not afford to put any in my aquarium to face the White Spot and other troubles I was having to contend with at the time.

It was not until the Autumn of 1951 that I bought my first two fish of this species. The dealer assured me that they were a pair, although at the time they both looked identical to my inexperienced eye. Events proved that he was right. By February, 1952, the female had filled out and I thought I would see if anything could be done in the way of spawning them.

I had by this time successfully spawned most of the Danios, White Clouds, Tiger Barbs and several of the Characins, including Black Widows, Flame Fish and Bloodfins, so I was not without experience.

My first efforts were conducted in a one foot square tank, with ordinary compost and a good bunch of Hornwort in the centre. Temperatures from 70 to 80 deg. F. were tried, but all to no avail.

I next tried the same tank, but with a layer of peat on the bottom. The plant used was Hornwort again, but this time I included water from my garden pond (carefully strained). I used this method several times as the fish seemed happier with the dark tank base which the peat gave them, and therefore I thought they would be more likely to settle down to the job required of them.

Adult Female Slimmer

On March 17, the pair had been together for four days and, as I had observed nothing unusual, I decided to remove them. On catching them, however, I noticed that the female appeared much thinner than when put in. As a precaution, I blacked out the breeding tank with newspaper, although not daring to hold any hopes of success. On the evening of the 20th, I decided to have a peep so, having removed the covering of newspaper, I held a strong light over the tank. To my amazement I saw one or two fry hanging from the Hornwort. I put the light out and left the tank uncovered to lighten gradually next morning.

On the 21st I saw four fry hopping about the bottom,



Photograph]

[E. L. Telfer

Shoal of Neon Tetras (Hyphessobrycon innesi) showing their brilliant colouring against a background of dark Cryptocorynes.

and making their first efforts to swim. By the 24th I had seen six. I did not know what to feed them on so I decided to give them a bit of everything in the hope that they would find something to their liking. I went dried egg, cultured Infusoria, strained pond water and spinach. As a precaution against pollution I changed about a third of the water every few days. Although I had strained my pond water very carefully I found I had quite a colony of *Cyclops* in the breeding tank, but I did not see them attacking the Neon fry.

Three weeks after the spawning date the fry had started to colour up. The blue-green eye and red tail clearly showed their identity, and after four weeks I had 10 perfect little Neons—not many, but a very satisfying achievement.

On March 29 I again put the parent fish together, this time in a 24 x 14 in. slate-based tank, with about 1/2 in. of peat. The water was fresh tap water about 4 in. deep. The back and ends of the tank were painted white so that I should have a better chance of observing both parents and fry.

At dawn the next morning, with a temperature of 76 deg. F., the male was driving his partner round the tank and into the plants at intervals, the pair coming together and remaining stationary for a few seconds, trembling. They moved slowly forward and upward at an angle of about 45 deg., the male sliding along the female and, as they parted, the eggs were released and fertilized. Any number from one or two, up to about a dozen were dropped at each pairing.

The fish paired in the upper regions of the plants or over the top of them, also in the corners of the tank, but always near the surface. The eggs are adhesive and can be seen fairly easily as they drop through the water but, as they fall among the plants, not many of them are visible. As the spawning went on I saw that the female fish was very partial to her own eggs. I have found out subsequently that most female Neons are. I think this must have been the reason for my small first hatching. A virile male will counteract this to a great extent, keeping her on the move by his continuous driving, but some males seem to be rather half-hearted and then the female has a good meal. The text-books tell us not to tap the glass of our tanks but, believe me, I have done this in sheer desperation at times to distract the fish from its egg eating. When the males join in the meal it is time to remove both fish from the spawning tank.

After their removal I again blacked out the tank with

Inheritance in Fish (4)

(Continued from previous page.)

aquarists have thought that olive-grey Nacreous fish were Metallic ones merely because they had the colour of wild-type fish, and others have classified brightly coloured Matt specimens as Nacreous ones just because of their colours. The only criterion of the groups is reflecting tissue or shine.

Popular nomenclature divides the fish into Scaled and Calico types. Scaled fish are those which have a metallic appearance all over so that the scales (to be strictly accurate we should say the reflecting tissue behind the scales) are conspicuous, but as all Goldfish have scales the term is not very suitable. Scaled corresponds to the G.S.G.B. term Metallic. Calicos are supposed to resemble a piece of coloured calico and presumably all fish other than Scaled ones fall into this group. Most readers will see at once how inappropriate this nomenclature really is, as there is no connection whatever between Scaled and Calico. The terms Scaled and Calico are gradually being discarded and the

the plants and across the bottom of the tank. As the days passed the fry behaved just as most other fish fry do, hanging on the glass sides of the tank before becoming free-swimming about six days after spawning.

At this stage I commenced feeding pond Infusoria and dried egg. After about another week I gave them Mikro-worms, screened *Daphnia* and *Cyclops*. At three weeks they were colouring nicely and by then were much easier to feed, taking anything provided it was sufficiently small. At two months they were as large as those usually offered for sale in the shops, and a final count revealed a grand total of 86.

Over Eighty Fish at Second Attempt

On May 4 I put the parent fish to breed again and another successful spawning followed. This time I reared 83. A later spawning yielded 63. So that meant four spawnings and four hatchings with no failures. This Neon breeding was dead easy, so I thought, and I had visions of thousands just for the asking. But it was not to be.

After one or two more spawnings, some of which were infertile, my male fish died, and I had to wait for my first ten young to mature. Out of them I managed to get four pairs. So I commenced operations with these. They spawned regularly enough but very often the eggs were infertile or just dissolved. Sometimes just a few hatched or I would rear a few dozen. I would have a fairly good spell and then, for a month or two, all efforts would fail. This was followed by another good spell, then more failures and so on, right up to the present time.

Up to the time of writing this article I have had over 160 spawnings, but I have never reached the high degree of success that rewarded my first efforts. What is more, I have

not discovered the reason for all the failures, although I have certainly learned a lot about Neon Tetras. Very often a female will swim round the tank or hover over the plants with eggs dripping from her, but the male not taking the slightest interest. So the presence of eggs does not always indicate that a pairing has taken place. Even after a vigorous drive and what appears to be a good spawning, the result is often just a mass of infertile eggs. Yet the same pair in the same tank a week later will produce quite a good brood.

There is no doubt that very soft water with a low pH is required. The water is easily acidified with peat. I do not think the age of the water matters a great deal, because I have had success with tap water two days old, and also water up to a month old. Blacking out the tank for 48 hours after the spawning is my usual practice, but here again I have deliberately left eggs uncovered and have had them hatch out, so this does not seem to be essential, although strong light is not good for many eggs. Temperature does not seem to matter much. I have done equally well at 70 deg. F. as I have at 80 deg., but I think the middle seventies about the best.

In conclusion, my advice to would-be Neon breeders is this. Get a few young fish from a reliable source and grow them on for a few months, feeding them up on as much livefood as they will take; White Worms and *Daphnia* form the main dish for mine. After this time the sexes should be easy to distinguish. The males never seem to get rounded however much they eat. I usually put the fish in the breeding tank after dark on Friday evenings, as I have the weekend free to be on the spot when they spawn, so that I can see just what takes place. If they do not oblige I take them back to the community tank on Sunday night and try again the following weekend.

Aquatic Plants

HORNWORT (*Ceratophyllum demersum*) is a plant with a show of independence. Whilst it may develop "rhizoid branches"—merely transparent shoots from the stem and not true roots—to anchor itself into the bottom layer in a stretch of water, it may equally well remain free-floating and spread into thick, dark green surface masses in the stagnant or slow-moving waters where it abounds in Gt. Britain, North America and Europe.

In cultivation the species is more truly at home in cold water, whether it be the garden pool or the coldwater aquarium, but sometimes it will grow apace at tropical temperatures although its colour is then lighter. More generally, at higher temperatures, it will show its distaste and rot on the spot.

A pleasing feature is its really dark colouring, which can form an effective contrast in a coldwater aquarium. It has its practical use, too, and may be employed as a convenient spawning medium for a number of fishes. Goldfish and other Carp-like fish often develop a taste for it, which in the garden pond can help to keep the plant under control but; in the furnished aquarium, can cause some untidiness.

The stems of the plant are quite stiff but very brittle and sprigs should be handled with care to avoid damage. There is considerable branching of the stems and much divided leaves, eight to a whorl, clothe them. The apical growing points are particularly densely packed with leaves and they tend to survive the Winter outdoors when other parts of the plant die.

As an indoor tank plant Hornwort does well and requires a moderately strong light. For Winter decoration it is extremely effective when the supply

Hornwort

(*Ceratophyllum demersum*)

of other coldwater plants is at a premium.

Hornwort is generally propagated from cuttings which can either be weighted or allowed to float freely. If sprigs are actually pushed into the bottom gravel the buried part of the stem tends to rot as no true roots are produced.

The flowering of the plant is unusual in that the fertilisation takes place entirely under water, pollen dropping from the stamens on to the stigma of the submerged female flower. The flowers are insignificant, small and greenish, and borne in the axils of the leaves.

In its recommendation of suitable plants for furnished aquaria at shows, the Federation of British Aquatic Societies gives *Ceratophyllum* species for use in coldwater tanks only.



Three-spot Damsel Fish



Dascyllus trimaculatus—photograph, L. E. Perkins

OF the small, tropical marine fish imported into Europe, America and England, the Three-spot Damsel Fish is one of the more familiar types. It is hardy, striking, small-sized and reasonably easy to keep in the home aquarium. In its natural haunts it is found widely in most tropical coral reefs. This Damsel Fish is numerous in the coral atolls of the Pacific, around Ceylon, or the coast of South India, East Africa, in the Persian Gulf and Red Sea. It is not found in the Atlantic or Caribbean.

Most Three-spots find their way to the Western world's tropical fish markets from Honolulu, East Africa, and, to a small extent, Ceylon. As with all tropical marine fish, the price is comparatively high though they are not as expensive as Clown Fish (*Amphiprion percula*) or Lionfish (*Pterois volitans*). According to reports from correspondents all over the world, the Three-spot is not as often available as the Clown Fish, however.

The Three-spot is a member of the *Pomacentridae* Family, whose representatives are widespread and numerous in the tropical seas, especially in coral reefs. In common with most *Pomacentrids* it does not grow very large and breeds in a Cichlid fashion.

I have had several years' experience in keeping Three-spots and can say that they are about the hardest of all marine fish I have kept. It is not uncommon to have them living in modest home marine aquariums for several years, given the barest minimum of attention and specialised treatment. Perhaps the only other marine fish that can compete with them for hardiness are the closely allied Striped Damsel Fish (*Dascyllus aruanus*) and the rather rare *Dascyllus carneus*, which is not a very striking fish.

Found in Coral Reefs

Three-spots are found in most parts of Ceylon's coastal coral reef belt and are conspicuous by their absence in locations which are subject to infiltration of freshwater from rivers, lagoons and streams on the coast. Only where coral grows in abundance do we find them. On the East coast, where there is much coral, clear water and giant anemones, Three-spots live in the same manner as the Clown Fish species, *Amphiprion sebae*, hovering round giant anemones and seeking shelter in their tentacle clusters.

My observations, made over a period of 10 years, during

(*Dascyllus trimaculatus*)

Rotund Inmates for the
Tropical Marine Tank

By Rodney Jonklaas

which I have explored, collected and studied much of the coral reef fauna of Ceylon by skin-diving with fins and mask, have proved useful in devising means of keeping marine fishes alive in more artificial conditions.

The Three-spots, unlike the Clowns, do not nestle quite so close to the tentacles of the anemones. When alarmed, and especially when chased underwater with a hand-net, they flee cunningly, not into the mass of tentacles, but in amongst the living and dead coral close to the anemone. Although they enjoy a certain amount of immunity from the stings of the anemones' tentacles, they are no doubt not so immune as the *Amphiprions* and prefer to take less liberties with the stinging powers of their hosts! Only two species of *Amphiprion* and the Three-spots live in close harmony with the giant anemones in the coastal reefs of Ceylon.

Absence of Anemones

On the West coast, however, anemones are not found, although there are vast coral reefs. Three-spots are found living in association with the larger branched corals, such as the lesser staghorn. In this habitat they are joined by *Dascyllus aruanus*, *D. carneus*, the Blue-green Chromides and one or two other *Pomacentrids*, notably the Sergeant Major (*Abudefduf marginatus*) in its younger stages.

Very small Three-spots are never as numerous in shoals as young of *Dascyllus carneus*, for instance. They appear to hatch in smaller numbers, and there are seldom more than ten found in a single colony. Off Colombo, where the live coral growth is very poor due to intrusion of fresh water on the fringing reef, baby Three-spots take shelter round the spiny sea-urchins.

The largest Three-spots are about six to seven inches long and are usually found in mated pairs. Being large, they do not take fright as easily as the smaller ones and live in the vicinity of large coral formations, feeding mostly on plankton at mid-level. Whereas the young and smaller-sized Three-spots are strikingly beautiful with their jet black colouring and pure white spots, two on either side of the body at its centre and one on the forehead, the adults do not have such dense black colouring and their spots are very small and insignificant in comparison.

D. trimaculatus are at their snappy best when an inch long. They feed mainly on plankton wafted to them by ocean currents. In an aquarium they will accept any protein food, preferably fed often in small sifted sizes. The best food for them is Brine Shrimp and with this diet they grow reasonably fast. Chopped shrimp or fish roe, even Fresh-water Shrimp, are eaten with great relish.

The method of collecting Three-spots, as practised in Ceylon, is primarily through skin-diving. In coral heads, Three-spots are easily taken by the simple expedient of the diver detaching a complete head of coral and handing it over to the attendant boatman, who shakes it over a bucket

of water. The Three-spots tumble out in perfect condition, together with a number of other interesting coral dwellers like polka-dot coral crabs, Gobies, squirrels and brittle-stars. Round giant anemones they are more elusive and the skin-diver is obliged to pursue them underwater with a hand-net and corner them in crevices, or swish round the tentacles in the hope of netting a few.

The smallest are the easiest to get, the adults being far too wary to submit to capture by net or coral-breaking. The only way I have obtained the adults is by swimming above them with small rod and line baited with a tiny hook and a piece of prawn. The bait can be directed to the very mouths of the adults, who greedily accept it without the slightest suspicion.

Suitable for the Marine Aquarium

In the average home marine aquarium, the Three-spot makes an attractive, hardy and playful pet. It will not molest fish larger than itself, but it is not advisable to keep any Pomacentrids with it which are newcomers to the tank. A mixed collection of various species of Pomacentrids, if put in simultaneously, will speedily establish themselves and take up their positions in coral (which must be provided for them to hide in).

The "territorial instinct" displayed by the Pomacentridae is remarkable and much depends on humouring them in this respect, if the aquarist wishes to avoid death and destruction in his marine tank. It is necessary for every Pomacentrid to have at least one hideout or cave in the rockwork or coral of the aquarium. Without this, the fish, bereft of a hiding place or escape crevice, is obliged to oust others and start fights. Once an individual Pomacentrid is badly defeated in its battle for a home it becomes an outcast and the entire population of the aquarium sets upon it and kills it.

Once an aquarium with various Pomacentrids is established, let well alone and never—I repeat, never—introduce another fish, much less a Pomacentrid. If this should be done, war will surely break out and, not only the stranger, but other former peaceful members of the colony will die. If a single fish is observed to be bullied it must be caught up and kept alone until it is fit again. Putting it back with the established colony is well nigh impossible. The only way this can be effected with some measure of success is by altering the entire rockwork or coral pattern of the tank, removing all fish, mixing them up with the newcomer or previously isolated one in a bucket to confuse them and then re-introducing the whole lot into the tank, hoping that their confusion will have taken away all their pugnacious and "territorial" instincts.

The Three-spot makes a wonderful exhibit when kept with the Striped Damsel (*D. aruanus*), the Blue-green Chromide and the Blue Damsel, for contrast. Even in a colony of its own kind it is striking and a light or transparent background sets it off to the best advantage. In a tank with a black background only the white spots can be seen, the fish themselves being almost invisible.

Number of Fish Per Tank

Four or five Three-spots provided with a large head of branched coral will thrive and grow well in a tank of less than 10 gallons. Aeration is desirable, as is filtration, but the former is not indispensable if the tank is large and shallow. With the Three-spots most non-predacious marine fish are no danger, but swallows, like baby Groupers and Lionfish (*Pterois*), will soon eat up the Pomacentrids.

As with most tropical marine fish, Three-spots grow slowly but steadily in the aquarium. From the size of a pea to a length of three inches takes at least two years. The adults are probably at least five years old and there are so few of them in the wild state that it is very likely that mortality during the fairly long growing period is high. I have never observed these fish breeding in an aquarium but, in the wild, adults have been observed many times guarding small clusters of eggs in the same fashion as

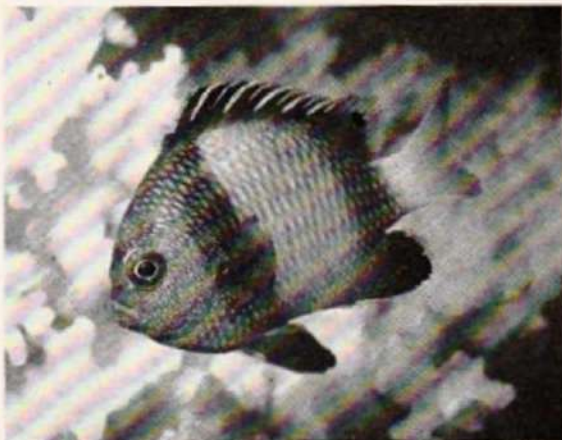
Cichlids. The fry hatch in small numbers, however, and must fend for themselves from an early age as the parents never extend their care long enough for one to observe the typically Cichlid family gathering with mother and father leading a brood of youngsters.

So far as I know, the Three-spot has not been successfully bred in an aquarium, public or private, but eggs have been laid and fry have hatched out. Monsieur Jean Garnaud, Director of Monaco Aquarium, sent me some preserved specimens of tiny, newly-hatched Three-spots which were born in captivity but which died soon afterwards.

Obviously we are unable to simulate natural conditions for raising the fry, mainly with regard to the constant supply of fresh, living plankton. Brine Shrimp nauplii are too large, of course.

Even in the wild state, a very small proportion of the young from each brood survives. In coral-dwelling colonies, the survival rate is higher than in anemone-haunting ones. The very small fry must be greatly sought after as food by reef dwellers, possibly baby Groupers which swallow any small fish they can creep up on.

Unlike many other Pomacentrids, Three-spots seldom change colour in captivity. In the wild state, I have noticed half-grown specimens assuming a grey hue, instead of the usual jet-black. This only occurs in very clear water when they are feeding on plankton at mid-level. Perhaps the



Photograph

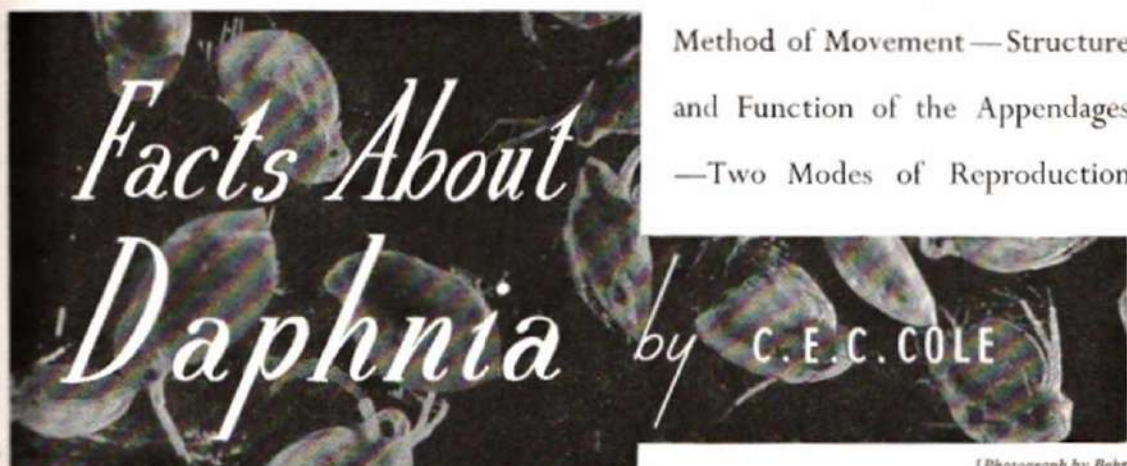
[L. E. Perkins]

A somewhat rare and dullish *Dascyllus* species—*D. carneus*.

temporary loss of colour is a means of reducing their conspicuousness at a level where they are prone to attack from predatory fish. Back in the coral or near the anemones the dark coloration is instantly re-assumed.

In the aquarium only sickly fishes lose their colour. A change of water sometimes restores this and effects a cure. The commonest disease is the marine counterpart of freshwater White Spot, *Oodinium*. The use of antibiotics for preventing and curing this has been advocated by several leading aquarists, also the treatment with dyes like Brilliant Green or Malachite Green. My experiences have indicated that quinine bisulphate is the best remedy. A grain for every two gallons of sea water, when the disease is in its initial stages, often effects a cure. Once the white spots disappear, a partial change of water, replacing with fresh sea water, is necessary.

In conclusion, the best way of displaying Three-spots is to give them a well-lit aquarium with a central clump of branched coral, cured and bleached, of course. They should preferably be kept in a small shoal of their own species only. A more attractive, lively and hardy group can seldom be found.



[Photograph by Behr

Method of Movement—Structure
and Function of the Appendages
—Two Modes of Reproduction

DAPHNIIDÆ is one of the Families of small crustaceans which comprise the Anomopoda Tribe of the Calyptomera Division of freshwater Cladocerans. In this article I propose to give some details of these creatures which we feed so liberally to our fishes. The term "Daphnia" is often used loosely to include many Cladocerans which are not members of the Daphniida at all.

To qualify for membership of the Family a Cladoceran must possess five pairs of legs, a gut without loops in it, from the top of which emerge two blind sacs, or cæca, and a pair of long, branched antennæ. These last-mentioned are equipped with powerful muscles and innumerable swimming hairs, and are used as organs of locomotion. Strong downward sweeps lift the body of the *Daphnia* in the water, but immediately the stroke ends the creature sinks again. The constant beat and pause causes the familiar "hopping" motion which, in conjunction with the flattened, brownish appearance of most species, gives them the popular name of "Water Fleas."

The five pairs of legs are concealed within the protective shell of the creature, and do not aid in locomotion at all. They are beautiful and intricate structures, the sole purpose of which seems to be to ensure a supply of suitably sized food reaching the mouth. Their rhythmic and almost ceaseless beating produces currents in the water which bring minute particles from all directions into the ventral opening of the carapace. Here the particles are forced through the fine filter combs and hairy spines of the legs,

being broken down and sorted out in the process, and finally collect in a mass below a pair of mandibles guarding the entrance to the cesophagus.

After a final crushing by the mandibles, portions are admitted for digestion. I have never yet seen any part of the mass rejected after it has reached the mandibles. It appears that anything that gets so far will be eaten. All except the tiniest of Infusorians are much too large for a *Daphnia* to tackle, but there seems good reason to suppose that bacteria, sediment and algæ form the staple diet.

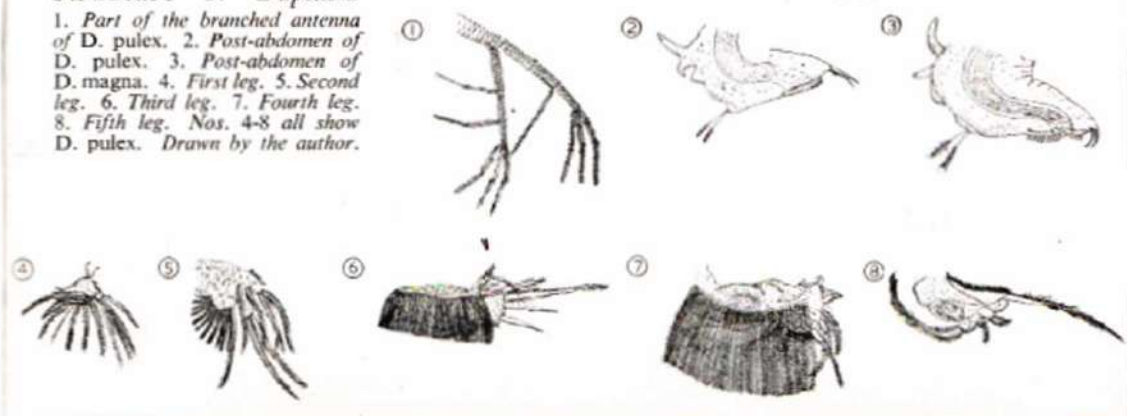
To Prevent Clogging

The larger pieces of "muck," if not dealt with, would seriously clog the filters and combs on the legs. To clean them, Nature has endowed the extremity of the *Daphnia's* post-abdomen with a pair of claws. The form of these and the general shape of this part of their anatomy are one means used to identify different members of the Family. Sometimes the claws are equipped with long toothed combs, sometimes short-toothed, and yet again no combs may be present. The claws are passed frequently through the filters on the third and fourth pairs of legs to clean them.

The life history of *Daphnia* is of more than usual interest and anyone who has studied it will no longer wonder why a pool empty (apparently) of *Daphnia* will become teeming with them in a matter of weeks. Nor will he be surprised to find that a dried-up pool will produce a heavy crop of *Daphnia* within a short time of refilling. Even dried *Daphnia*,

Structure of *Daphnia*

1. Part of the branched antenna of *D. pulex*. 2. Post-abdomen of *D. pulex*. 3. Post-abdomen of *D. magna*. 4. First leg. 5. Second leg. 6. Third leg. 7. Fourth leg. 8. Fifth leg. Nos. 4-8 all show *D. pulex*. Drawn by the author.



as supplied in the shops, can, under favourable conditions, be used to start a fresh culture.

I have experimented with four or five different species of *Daphnia* in an attempt to elucidate some of these mysteries, and the habits of all species examined conformed very closely to a fixed pattern—at least so far as reproduction was concerned. This is achieved by two methods—asexual and sexual.

In the first method, female *Daphnia*, which greatly outnumber the males, produce eggs which are parthenogenetic. These are laid in a brood chamber located between the back of the creature and the dorsal edge of the carapace, just below the heart. The laying process can be observed under the microscope. Each individual batch of eggs is laid in a matter of 10 or 12 seconds. They are kept in the brood chamber by a soft, finger-like process growing outward low down on the abdomen. The movement of the tail of the abdomen lowers this process, and the eggs drop slightly, to be pushed back again when the post-abdomen once more relaxes. Occasionally the movement is so great that one or more eggs escape altogether from the brood chamber and are lost.

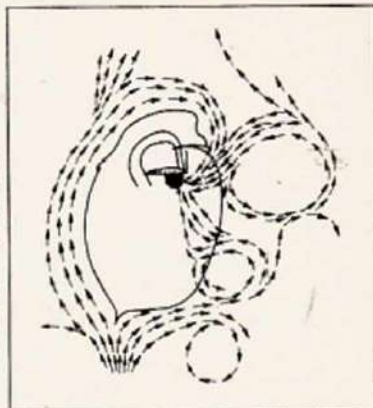
Speedy Egg Production

Development of the eggs is rapid. In normal temperatures, for instance, *D. magna* and *D. pulex* take about four days, and in low temperatures a little longer. When the young are ready the female will release them by the simple process of lowering the abdominal projection already referred to. The youngsters are completely equipped with swimming antennae, five pairs of legs and large, faceted eyes (one each). The number in the brood seems to depend simply upon the capacity of the brood chamber. With a young female it may be as few as four, but with a large female giving birth, say, to her twentieth batch, the number may be well over 60.

After expelling each brood, the female *Daphnia* moults, usually in a couple of hours, and within minutes of moulting lays a fresh batch of eggs in her brand new brood-chamber. A new-born *Daphnia* is mature within 14 days—sometimes less—and once she has released her first few youngsters

HOW A DAPHNIA FEEDS

This diagram shows the currents formed by rhythmic beating movement of the legs, which brings food to the mouth of the creature after it has been sorted and broken down.

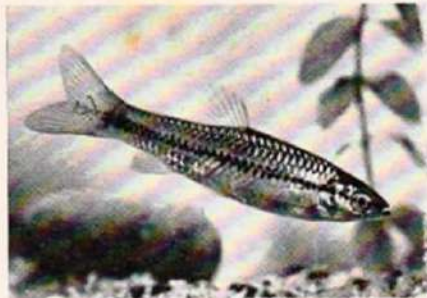


will moult, lay a fresh batch of eggs, and release another batch within five days of the first. Some four to five days is the average time between successive broods in all the species I have observed. The greatest number of broods given by any female under test conditions has been 22. The age of this female, a *D. magna*, was 90 days. She died with a partly-developed twenty-third batch of young in her brood chamber.

It is commonly believed that the sexual method is not utilised until adverse conditions, spelling disaster for the *Daphnia*, are present or will shortly develop. Examples of such conditions would be overcrowding, with resultant lack of suitable food, or the threatened drying-up of the *Daphnia* pool. In such cases it is perfectly true that males appear, and the females lay ephippia, or resting eggs, which may stay for considerable periods before developing and starting off a fresh culture of *Daphnia*, but my experiments revealed another and more reasonable explanation for their development. I will comment on this in the next issue.

— Know Your Fishes —

No. 40 *Rasbora einthoveni*



Photograph]

[G. J. M. Timmerman

For fishkeepers accustomed to looking upon Rasboras as tiny, colourful fish (viz. *Rasbora maculata* and the Harlequin), *Rasbora einthoveni* is likely to prove a disappointment. It has a certain air of distinction but by no standards could it be called striking.

General body colouring is grey with individual scales edged in a darker shade. Males show a purplish suffusion over the body and females, a greenish tint.

Both sexes have a conspicuous black strip running from the lower jaw through the eye to the caudal fin base. In the male this stripe is wider. Except where the black line crosses it, the eye is yellow. A reddish tinge runs through the caudal and dorsal fins of the male whilst all fins in the female are clear except the caudal, which is yellowish. Overall length of the fish is around 3½ in.

R. einthoveni, whilst comparatively large, is not offensive towards other fish, and is very accommodating, having a temperature range of 70-82 deg. F. So far as diet is concerned it is easily satisfied and will take dried food although it seems to appreciate meals of livefood at frequent intervals.

It is not one of the most difficult Rasboras to get to spawn and a large number of eggs are produced. Unfortunately many become affected by Fungus which may be due to unsuitable water conditions. For Rasboras, generally, an acid water is required if breeding success is hoped for. The eggs of *R. einthoveni* are laid among fine-leaved plants but some fall to the bottom and it is these which are more likely to become affected by Fungus.

After spawning, transfer of the eggs to a container of clear, shallow water will no doubt improve the breeding results. As the young develop, their growth is often uneven so the little ones should be sorted from the big ones if cannibalism is to be prevented.

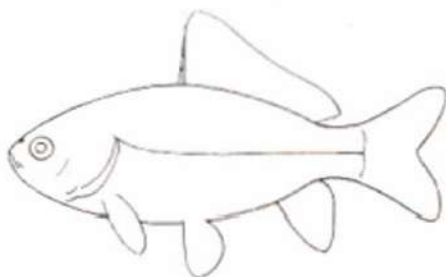
Habitat of *Rasbora einthoveni* is Siam, the Malay Peninsula and Indonesia.

Class: Pisces. Order: Ostariophysi. Family: Cyprinidae. Genus: *Rasbora*. Species: *R. einthoveni*.

Popular Goldfish

What to Look for in Quality Specimens
with Emphasis on the Common Goldfish

By Capt. L. C. Betts



THE ever-increasing interest in the Goldfish is a worthy recognition of the fascination it has for all fishlovers and a tribute to those die-hards in the hobby who have resisted the counter-attraction of tropical fish. They now see their first-love win back its way to popular acclaim. This series of articles will be no recital of Federation versus Goldfish Society standards but rather an appreciation of the popular varieties of Goldfish so that those who are already won over may appreciate their fish better and those who are hesitating may have a picture to help them make up their minds.

First, there are several factors which are common to all varieties and which should be understood at the outset to avoid needless repetition.

Goldfish, which are a branch of the large Carp Family, are identified as of the species *Carassius auratus* and have a life around eight to 15 years, dependent on conditions and available food and feeding. Twelve inches would be an exceptional length and around one pound in weight would be considered a heavy fish. The species is distinguished from its near relative the Golden Carp by the fact that the latter has two barbels at each corner of its mouth, can expect a longevity of 20 years and over, reach two feet in length and weigh anything up to 10 pounds in weight. I have no knowledge of any authenticated case of the two cross breeding.

Metallic and Matt Fishes

All varieties of Goldfish fall into three groups, identification being established by the presence or otherwise of reflecting tissue. Those fish showing the maximum amount of "shine" are known as Metallic and those where the shine is absent are termed Matt. A third, known as the Nacreous group, has an intermediate amount of shine but this group is not true breeding and the day may come when the purist will not recognise it although, as every one knows, it is the group (Calico) which so far has received the most attention from breeders.

Thanks to sound work by Miss Daphne Morris, convincing evidence is forthcoming that the Matt Singletail is more colourful and generally more attractive than its Nacreous (Shubunkin) counterpart, which, after all, is only a bastard group breeding out in its progeny to all three groups.

The lack of appreciation of this group factor has produced an illogical situation in which, for example, the Common Goldfish is only recognised in its Metallic form and the hobby has committed it to a life-long colour scheme of Metallic "rich warm" red. A Nacreous variant has been fixed but for some unexplained reason it became known as the "London" Shubunkin. To make matters worse, the makers of standards dropped the latter as a show fish in favour of the "Bristol" Shubunkin.

The reader will therefore appreciate that, in attempting my task, I have to perpetuate a fundamental error of classification by discussing varieties as they are popularly known rather than as they naturally fall into identifiable characteristics, each with their group variants. Because of this misinterpretation of the facts, the hobby recognises a Telescopic-eyed Fantail, a Telescopic-eyed Veiltail, but not a Telescopic-eyed Shubunkin, and, in

Federation of British Aquatic Societies' Common Goldfish

Body ..	30	Dorsal Fin ..	10	Caudal Fin ..	10
Pectoral Fins ..	4	Pelvic Fins ..	4	Anal Fin ..	2
Colour ..	15	Condition ..	15	Department ..	10

Drawing, reduced, reproduced from "Show Standards for Cultivated Fishes"

recognising the Telescopic-eyed Fantail and Veiltail, it fails to recognise both variations in the Matt Group. To further the confusion, when the Telescopic-eyed Fantail and Veiltail are coloured black they are known as Moors.

The Metallic (Scaled) groups are almost without exception confined to the "rich warm red" colouring classification although "variegated" colourings are recognised but not encouraged since they have to be classed separately. In practice it suggests that they are of inferior quality. This statement may be challenged but experience shows that seldom, if ever, does a variegated Metallic Goldfish gain an award in an open show.

All varieties of Goldfish should have a blunt, well rounded head and mouth, which are a sign of good breeding. Any suspicion of a snouted head suggests a coarse fish, which factor is difficult to eradicate once introduced into a strain.

Finally, let us give a justification for standards and a pointing system in an effort to interest the man who keeps Goldfish but sees no purpose in shows and showing. It is a human failing for people to want the best in everything they possess. Fortunes are spent on racehorses and dogs etc. The difference in value, as an asset in terms of money, may be as much as a thousand pounds solely because one animal has an authentic pedigree whilst the other had a mixed parentage. Further, using dogs as the example, Alsatians may be of equal pedigree but one has bent ears whilst the other has straight. The same difference in value can apply.

It will therefore be my intention to try to highlight the gulf that exists between a class Goldfish of whatever variety and one that is nondescript. A plump, well-fed Goldfish, active and healthy, may have no more value than that put on it by its owner. With a little study of the requirements, it is possible to keep only the best, which will cost no more to maintain than mongrels and which will give a sense of pride in possession.

Common Goldfish

The Common Goldfish gained its name in the days when fish of this variety could be bought for a copper or two. Forty years ago they were certainly common. They were seen in many a house, given away in exchange for old rags, and were the basic prizes at funfairs. But such is not the case today. Specimens can still be bought for a shilling but they do not seem to have the quality of those previously available. The Common Goldfish is now quite uncommon and a change of name is clearly indicated to lift it from the commonplace to the very attractive fish that it is, when possessed of its true characteristics and health and vigour.

As is to be expected, it is the hardest of all the Goldfish and the easiest to maintain. That does not mean it should be kept in round bowls or crowded into small aquariums. On the contrary, it should be given plenty of room to swim around as it is an active fish. It must have a good ratio of water to fish if it is to grow. I think it is time someone spoke out and killed once and for all the misleading and

erroneous idea that an inch of fish requires a gallon of water or, alternatively, 24 square inches of water surface. The Common Goldfish will live using this formula but they will never thrive and any time the water temperature rises above 50 deg.F. the water should be changed night and morning.

Two three-inch fish want at least six gallons of water each and, for every inch that they grow, they will require another 4 gallons of water each. I can hear some readers saying "This is an exaggeration, it is possible to keep them in less than that." So it is but I am thinking in terms of handsome fish in show condition.

What are the specifications of fish which are to get such lavish conditions? First of all, the Common Goldfish is a "chunky" fish, that is to say it is not long and sleek but short and thick-set. The small, rounded head, from the nose to the posterior end of the gill plate, is approximately a quarter the length of the body. The mouth is small and blunt with the two halves lapping evenly. Any resemblance to a snout a very poor type.

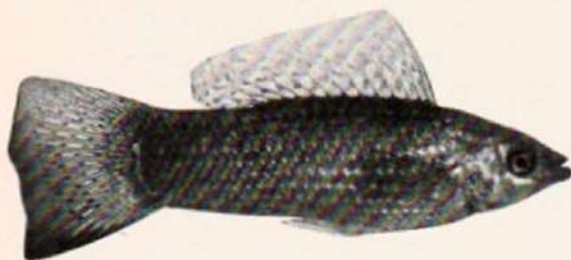
The dorsal and ventral profile of the body should be evenly developed either side of the centre line of the body, setting the fish on an even keel. The line of the head should continue unbroken, rising evenly to the middle of the fish and then falling away evenly to the base of the caudal peduncle. It is a very serious fault for the body contour to rise sharply from the base of the head, giving the fish a round-shouldered

appearance. There is sometimes controversy as to the point where the first ray of the dorsal fin should start but there seems little doubt it should begin at the highest point of the contour or, in other words, in the centre of the body.

The body depth should be 2/5ths of the body length and the height of the dorsal fin, half the body depth. The size and shape of the tail are also important. Relatively speaking, it is a short, powerful-looking fin, only slightly forked and with the ends of the lobes well rounded. Fish with pointed lobes and deeply forked tails are not in type and are usually throw-backs from Bristol Shubunkins. The rest of the fins are relatively short and stubby with rounded ends.

The present demand is for a red coloured fish which the purist refers to as a red/orange. There is no doubt that the best specimens for colour are those which colour from the olive green at a very early age, usually passing first—and quickly—through a black phase. Those fish which pass slowly through olive green, yellow, yellow/red stages, seldom if ever attain that depth of red which characterises the champion. One thing is certain, and it is that the colour factor is most important in breeding.

The body shape is relatively easy to obtain, provided the fish is true to type, but breeding for the rich red colour requires constant vigilance. I would like to see the present Federation pointing adjusted from "Body: 30 points" to "25" and "Colour: 15 points" to "20" in order to even the balance.



I WAS most interested to read the article by Dr. Myron Gordon in the last issue, on the subject of *Mollienesia petenensis*. He mentioned the fact that a few of the young fish, when obtained in 1954, had been sent to British aquarists and I was fortunate inasmuch as Mr. H. R. Axelrod, of New York, who received four from Dr. Myron Gordon, sent two, about a fortnight old, to me, with other Mollies.

The first point I should like to make is that, as they were so young, they must indeed have been hardy in order to travel with some 60 other fish in a polythene bag from New York to my home in Epsom, Surrey. The water in the container had been treated with sodium amylal to slow down the metabolic rate of the fish contained in it. This is Mr. Axelrod's practice whilst sending fish to me during the warmer Summer months when the oxygen content of the water is lower and the activity of the fish greater than during the Winter. The Lake Petén Mollies withstood the treatment as well as the other occupants of the container.

Arrival of the Fish

They arrived on June 25, 1954, and were quite inconspicuous, being of the same sombre grey colour that one associates with the normal varieties of *M. velifera*, etc., when very young. They were placed in a 30x18x12 in. tank which was situated as near to the roof of my fishhouse as practicable in order to obtain the maximum light.

They received no special feeding but were reared, along with some *M. sphenops* in the same tank, mainly on porridge, both cooked and uncooked, "Bemax," and a well-known proprietary make of cat food, with only very occasional feeds of *Daphnia* and White Worms.

Growth seemed to be extremely rapid and now the

Lake Petén Mollies

K. D. Fawcett Tells of his Experiences

remaining specimen (a male), which is no more than twelve months old, exceeds 4 in. in length. Unfortunately, the female, for I was lucky enough to have received a pair, died at an age of approximately nine months.

The male, as will be seen from the accompanying illustration, has not as yet developed the full dorsal fin which one would expect with this variety. The photograph, by Mr. L. E. Perkins, was taken two months ago and the fish has, in fact, developed further since then. A point that I would like to make particularly is that this illustration does show, to a certain extent, the semi-sword like projection at the base of the caudal fin, which was obscured in the photograph of the pair which illustrated Dr. Myron Gordon's article. This sword-like extension is, I understand, a particular feature of the fish and, although I doubt whether its growth will be anything like that of the normal Swordtail (*Xiphophorus helleri*), it will serve to distinguish the Lake Petén Mollie from its close relative, the Velifera.

As I am at present lacking a female fish of *M. petenensis*, but hope to obtain one in due course, the male has been placed with female Velifera Mollies, in order that some young may be produced, for I believe that it is impossible to obtain a true female *M. petenensis* in this country at the present time. From observations made over the past few weeks, the male will pay court to the female grey Velifera, but has never been observed courting Blacks.

I have heard from various American sources that these fish are great jumpers, and that in one case a well-known American aquarist had found it necessary to keep his Petenensis in pools, the sides of which were 10 ft. above the level of the water line. He found that as soon as the males sexed out they would jump out of the aquaria and he lost a number of fine specimens in this way.

The coloration is very similar to that of the Velifera. It consists of blue-green highlights which shine quite brilliantly, especially in a tank with a rather dark background, overlaying a sombre olive basic colour similar to the Velifera. With *M. petenensis* the whole effect seems to be on a much larger scale and is most impressive.

Starting a Vivarium (I)

Amphibians and Reptiles Are Not [Difficult to Keep in Good Health, Says Alfred Leutscher, B.Sc., and He Gives Their Basic Requirements

ANYBODY who keeps an animal collection must be only too familiar with the passing remarks of a friend who wants to know how it is possible to keep animals, which are naturally wild, in healthy and apparently happy conditions. Having duly admired the fish, reptiles or birds, he then asks, "How do you find the time to do it? What about feeding and expense? Does it take up much space, and are knowledge and experience necessary?"

This article is an attempt to give an answer as far as the vivarium hobby is concerned, and is written for young as well as adult readers of *WATER LIFE* who are either newcomers to the hobby, or who may already be experienced aquarists, but have not yet taken up the vivarium hobby. First of all, let it be said that every pet lover, no matter what he keeps, should ask himself the above questions before taking on this responsibility. Pets are at the complete mercy of their owners, and it is therefore our duty to see that they receive the best care and attention we can give them.

Availability of Food

The question of time, space and expense is a matter for every reader to decide personally. Food should next be considered. Is it easy to obtain and available at all times? Thirdly, there is the question of understanding one's pet. What surroundings does it live in best? Are there any ailments or enemies from which it must be protected?

A lot of this understanding comes from experience and book learning, or from advice given by knowledgeable friends, but in the long run a great deal of it boils down to plain common sense. In this article we shall deal with the amphibian side of the vivarium hobby. These creatures belong to the animal Class, called the *Amphibia* (frogs and toads, newts and salamanders) which range in size from frogs and toads less than an inch long, to the five-foot Giant Salamander of Japan and China.

With some exceptions all amphibians agree in certain basic characteristics. They are back-boned animals with a variable body temperature (called "cold-blooded"); their skins are naked, and the young pass through an aquatic tadpole stage bearing gills. Most amphibians are carnivorous, and feed on living insects and other small creatures such as worms, slugs, crustaceans and millipedes. We visualise a small, somewhat shy creature which hides away in undergrowth, in ditches, under stones and logs, avoiding the hot sun and dry, exposed air because of its soft, delicate skin. Somewhere in the neighbourhood is a pool or pond to which it must travel in the breeding season, in order to produce a family.

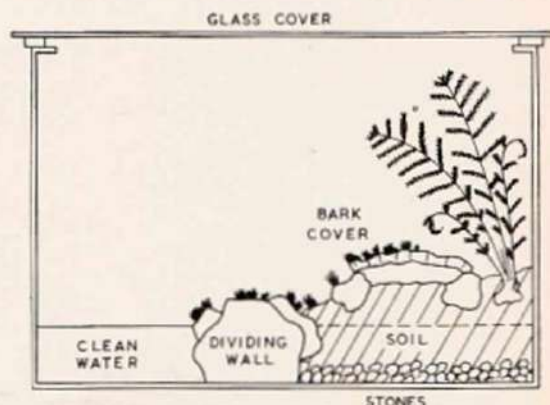
Disposition of Amphibians

Being cold-blooded it will conserve its energy, and will remain quietly in one spot for long intervals in contrast to the more restless, warm-blooded mammals and birds. It hides by day from the sun and enemies and comes out after dark to hunt its food. In countries which have a cold winter it hibernates.

How can we satisfy all these conditions in captivity? From long experience I find that for most people the ordinary aquarium is the best. This gives good viewing, is compact and easy to handle, and is watertight. If a sheet of glass is placed on top, it will cut down ventilation and produce a humid atmosphere inside, which is one of the requirements

of amphibians. It also prevents the creatures escaping. I raise my glass covers on corner supports of sponge rubber. This cushions the glass and lessens the risk of breakage. The space between the glass and frame is less than half an inch, and allows a certain amount of ventilation.

To convert the aquarium into a vivarium for amphibians, I usually go about it in the following way. A low barrier of rockwork or large stones is laid across or along the middle of the aquarium, depending on what area of water space is needed. The height of the wall is about four to six inches. Alternatively, a piece of tree branch is cut to the required length and placed in position. One side of the aquarium is now filled in with loose soil (a mixture of leaf-mould and sand) to the height of the wall. It is laid on a foundation of loose stones. In the soil is planted a selection of small shade and moisture-loving plants, such as ferns and mosses. In odd corners hiding places are made from broken flower pots and pieces of curved bark, raised up on stone pillars. Bark taken from old, fallen trees is especially suitable, as



A simple yet adequate home for amphibians. The container is an aquarium set up with ferns, bark cover and rocks.

it is often covered with moss. This will keep in a fresh, growing condition for many months.

The other partition is filled with water until a level is maintained just below the top of the wall. It should be about three inches deep. Much of the water will soak through the wall into the soil. This is all to the good since the plants benefit from damp earth. In Nature that is what happens alongside a pond or river, and near a wet ditch. Plants in these places like to have their toes wet.

The type of vivarium I have described is sometimes spoken of as a "wet" vivarium, as opposed to a dry one which is more suited to reptiles, like snakes and lizards. The "wet" vivarium should be placed in a cool, slightly shaded spot away from direct sunlight. Close to a north or east window would do very well.

As inmates I have chosen two hardy favourites which never seem to give me any trouble. One is our native Common Toad (*Bufo bufo*) and the other, the European Salamander (*Salamandra salamandra*), a widespread species in Continental countries. Two or three specimens should live comfortably in an 18 in. converted aquarium. The

two species will even live together, but should all be about the same size, since cannibalism is not unknown. The small specimens mysteriously disappear, and the larger ones look even fatter and more self-satisfied.

Common Toads are to be found in the countryside, especially when breeding in their ponds in Spring, or in woods and lanes during Summer evenings. The European Salamander is usually to be had from our dealers at a reasonable price. At first these pets may show a little shyness, remaining in hiding and refusing to feed. In time they will become bolder, and should be feeding before the week is out. They tend to come out during the evening. I have found that their tameness is so marked that they will take meals from one's fingers, even attempting to "catch" a finger which is waved in front of them.

My salamanders can now sense my presence as soon as I enter the room, and will come out of hiding in anticipation of a meal. A favourite pet toad will allow me to hold it up on the palm of my hand, close to a wall or window where a fly is crawling, and immediately catch it with its tongue.

Food for these amphibians can consist of a variety of insects, worms and slugs. Beetles are favourites with toads, and small slugs with salamanders. The food is simply placed loose in the vivarium, or in a shallow feeding dish. Fly maggots and mealworms, bought from dealers, make a useful standby. To see that each gets a fair share, I usually take my specimens out, and feed them separately on a wooden "dining" tray which I keep for this purpose. Incidentally, amphibians should be handled gently, and preferably with fingers wetted first.

It is doubtful whether toads will breed in confined space,

but it commonly occurs in garden ponds and outdoor vivariums. With salamanders breeding is commonplace and I have known it to occur in captivity at all times of the year. The female enters the shallow water to produce her family (she is a livebearer), and these babies take about three months to develop. I remove them to a separate dish of shallow water, and feed on *Daphnia* and chopped *Tubifex*. Tiny worms and pieces of raw meat are added as they grow in size. At metamorphosis they take on the bright colours of the adults, and leave the water.

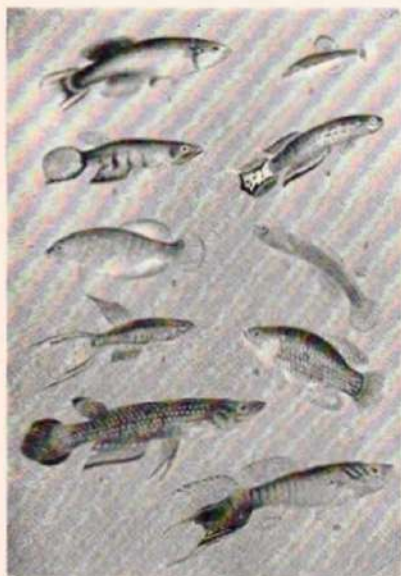
No Truth in the Legend

No doubt readers are aware that this species is the notorious Fire Salamander of the European legend in which it is said that it can exist in fire and is highly venomous. Both ideas are nonsense, and it is quite harmless to humans. The colours are merely Nature's way of warning off enemies. The skin of the salamander, also that of the toad, contains a highly distasteful secretion which acts as a protection should an enemy try to bite or eat these rather helpless creatures. With the exception of snakes, few animals molest them.

Disease Rarely Encountered

Illness and disease are rare with these two amphibians. Fungus is the most common, and then only occurs through dirty water, overcrowding and poor health due to bad treatment and wrong feeding. There is no reason why these two engaging and interesting pets should not be kept for 20 years, as has been done already by vivarium keepers.

The next article will deal with the care of some common and hardy reptiles for the beginner.



Among the 18 pages in full colour included in "Guide to Tropical Fishkeeping" are six identification plates by R. A. Vowles. A much reduced reproduction of the one illustrating Egg-laying Tooth Carps is shown here on the left.

THE new standard book for fishkeepers, J. H. P. Brymer's "Guide to Tropical Fishkeeping" has been acclaimed as filling a long-felt want and copies of the first edition are selling quickly.

Our contemporary Swedish journal "Akvariet" has published a lengthy and appreciative review in which it states:—"There has for a long time been a need for a large and comprehensive book on aquaria in the English language . . . WATER LIFE has been aware of the need for a really thorough aquarium manual . . . they have chosen to illustrate the fishes

"Guide to Tropical Fishkeeping"

Swedish Journal's Complimentary Review

in the main by means of photographs and this is a very suitable choice . . . we are particularly impressed by the many beautiful photographs which were taken by the Dutch master photographer Timmerman.

"There can be little doubt that Brymer's book will turn out to be the companion book for those whose hobby is aquaria for a long time to come, and this will not be least because the author had done such a lot of work in making sure that he has the correct nomenclature.

"There are a lot of nice things we could say about 'Guide to Tropical Fishkeeping,' which is a book one can seriously recommend to any person who is interested in aquaria and who is able to read English, and it certainly should not be lacking from any club library . . . it is the most beautiful book of its kind."

The views expressed in the journal catering for Swedish aquarists are similar to those made by knowledgeable aquarists of all countries who have seen it. Nearly 200 pages are devoted to details of all the well-known species and varieties of tropical fishes, there are 269 black and white photographs, 24 coloured photographs and 6 identification plates showing 68 fishes. A copy of this book on your bookshelf means that you will have by you an authoritative and up-to-date work giving the latest information about available tropical fishes, supported in many cases with reliable photographs which make identification easy. Order your copy now from any bookseller or newsagent or send your remittance direct to the publishers.

"Guide to Tropical Fishkeeping." Price 35/- (36/- by post). 352 pp. plus 18 colour insets. Over 300 black and white photographs, drawings and charts. Published by WATER LIFE, Dorset House, Stamford Street, London, S.E.1.

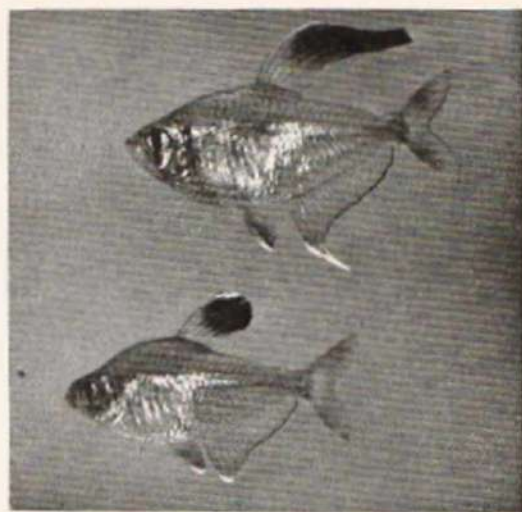
Rosy Tetras

(*Hyphessobrycon rosaceus*)

Brilliant Characin Species When
Its Requirements Are Satisfied —
Acid Water and Careful Selection
of Fish for the Breeding Attempt

By D. R. Butler

*Pair of very well developed
Rosy Tetras. Male is the
upper fish here. Photograph
by G. J. M. Timmerman.*



THE Rosy Tetra or Black Flag Fish (*Hyphessobrycon rosaceus*), which originates from British Guiana and Brazil, is without doubt one of the most attractive tropical aquarium fish available at the present time. The Rosaceus reaches a length of about 1½ in., the male being slightly the larger in most cases. Colour generally is a subdued red with a silvery to greenish sheen. Fins are a deep pink with a large black spot on white ground in the dorsal. The anal and pelvic fins have a white tip and the caudal has a brown-red margin. Males are very easily distinguished when adult as they have far longer and more pointed dorsal fins than the females. A good male specimen may bear a dorsal quite as high as his body depth, and is a wonderful sight when carrying it erect, as is often the case, particularly when several adult pairs are kept together.

Rosy Tetras are hardy fish, extremely peaceful and possess good appetites with the usual Tetra preference for livefood.

In view of its many good points, the Rosaceus is much sought after as a community aquarium occupant and, if kept under the right conditions, it is usually the most-outstanding inmate. The correct conditions are sparkling clear water and an attractive background of healthy green plant life. If kept in unsatisfactory conditions (i.e. very old water with an abundance of sediment) the fish tends to become listless, of an uninteresting colour and the proud dorsal of the male droops sadly as if in protest against such treatment. By all means have a Rosaceus to complete a community aquarium but spare him a thought and he will show his appreciation.

Two Points to Consider

If anything can be said against the Rosaceus then it can only be that this fish is a little troublesome from the breeders' angle. This problem can, however, be overcome by the more patient aquarists who take the time and trouble really to understand its requirements. As will be seen in the following remarks on breeding, the two most important points to consider are the type of water and the maturity of the breeding pair. Without consideration of these factors I would say that repeated success with the species is rather unlikely.

Rosaceus will only spawn in water of an acid nature with a pH reading of 6.4 to 6.6. Lower than this can be successful, but I find the resulting fry are not too happy and a high mortality can follow. My most successful efforts were achieved when the breeding aquarium was carpeted with peat, and tap water, allowed to mature for about one week, was used.

The breeding pair should be not less than two years old. I say this despite the fact that a professional breeder tells me that he obtains outstanding results with six-month-old fish. The pair must be in the peak of condition and in complete accord, i.e., brought up together in the same aquarium from as early an age as possible. Any old pair which happen to come to hand will invariably not oblige. If the above two important factors are adhered to, then, in conjunction with the following methods, and reasonable luck, we should see a big increase in Rosaceus production in Gt. Britain.

Conditioning the Parents

Detailed information will now be given from the point where the prospective breeder is fortunate enough to have a pair of two-year-old fish. Commence the usual conditioning with livefood, consisting of *Daphnia*, chopped Earthworms etc. Continue this feeding for about two weeks. Whilst these preparations are in progress the breeding tank should be selected. One 24 × 24 × 12 in. is ideal. It should be very thoroughly sterilized, even to the extent of running a brush dipped in boiling disinfectant around the corners of the tank. I find that it is impossible to take too much trouble in this respect when dealing with the Rosaceus.

The peat should be boiled and then layered over about one half of the tank bottom; several good handfuls usually suffice. After boiling the peat pour off the water and tip the peat into a clean piece of cloth, wringing out any surplus moisture. The peat should be spread evenly over one half of the tank bottom and pressed down firmly. If covered with clean paper held down with a clean jar, it will be found that fresh tap water can then be gently poured into the jar and the tank filled to a depth of about eight inches without undue disturbance. The jar and paper can be carefully removed after this operation has been completed.

For a spawning medium I always use the one material which can be thoroughly sterilized—coconut fibre, two bushy clumps will do, arranged and anchored so that the tops are about 1½ in. clear of the water surface (Rosaceus often spawn above the medium). These clumps should be set toward the end where there is the layer of peat. I also find it a good plan to use a sterilized one pound jam jar in a corner of the tank away from the peat in which the diffuser block and stem can be put. Heavy aeration is necessary for these fish, but it would be impossible if these precautions are not taken in view of the presence of peat in the tank.

After this set-up has been allowed to mature for about one week, I usually find that the pH is about correct and the

breeding pair, now very lively after their enriched diet, may be introduced. As these fish usually spawn on the third day under the conditions I have described, I find it convenient to place them in on a Thursday evening, with a view to being around on the Sunday to watch events and to remove the pair soon after completion of spawning. Rosaceus are avid egg-eaters and many a good spawning has been greatly reduced by delay over this operation. Thus, with a fish which usually spawns to a time-table, try to be around when the eggs are laid.

When the adult fish have been introduced, the tank should be completely darkened out at the back, top and ends and also the clear bottom half, if necessary. A diffused lighting arrangement should be arranged at the front by hanging paper over at an angle. The temperature should be around 80 deg.F., the ideal being 78 deg. Heavy aeration should be applied each night until the dawn of the day spawning takes place.

On the first day after introduction, little change will be seen in the fish, but they should be feeling at home by this time. The following morning both will appear very lively and the female should be showing great interest in the male, occasionally chasing him about the tank. On the third morning a fundamental change should be evident and, if all is in order, an hour or so after the aeration has been cut, the male will be seen darting toward the female with fins spread to their fullest (a wonderful sight this). The female will respond in like manner and will suddenly dash among and over the coconut fibre with the male very close.

Here they make contact side by side, jerking away in the typical *Hypheosobrycon* manner. After each contact about 10-15 amber-coloured eggs can be seen falling among the fibre, a number coming to rest on the peat. This procedure continues until the female is obviously spent, usually after an hour or so, when the parents should both be removed with as little disturbance to the peat as possible. Aerating equipment should also be taken out and the tank completely darkened.

Hatching Period

At 80 deg.F. the eggs hatch out in about 18-24 hours, when the tiny fry, also amber in colour, can be seen corkscrewing to and from the surface. After about three days they become free-swimming and very tiny Infusoria may be introduced in the usual manner. Green water is also very useful initially. The fry are very slow growers and need Infusoria for at least two weeks, when Brine Shrimp may be carefully introduced, followed by Mikro-worms.

They need plenty of room for development and, with a spawning sometimes numbering 200-300, plenty of tanks are wanted. I find it best to move them when approximately four weeks old to tanks about 2 ft. long, not introducing them to larger tanks until about six to eight weeks as they are inclined to lose themselves at the earlier age in outside tanks. After about three to four months, growth speeds up rapidly and, by six to eight months, if given room, Rosaceus about one inch in length will be swimming in shoals around the aquaria.

Positioning and Lighting the Aquarium

Providing the Right Setting and Support—Methods of Illumination

Sturdy wooden stand for a large aquarium set up at Bleak Hall, Biggleswade.

AMONG the necessary incidentals after the purchase of an aquarium are a light canopy and a stand. The light reflector, in some form, cannot be dispensed with, but a suitable ledge or sturdy table can be utilised instead of a specially constructed aquarium stand, if it is available. The support for an aquarium must be of substantial proportions as a 24 x 12 x 12 in. tank filled with water, gravel and rockwork weighs considerably more than one hundred-weight. If at all uncertain about the strength of an available shelf or table, play safe and buy a stand specifically made for aquaria.

The more orthodox types of these are of angle iron with space for two aquariums—and sometimes three—arranged in tiers. When only one aquarium is to be set up initially, this would be placed on the top shelf with sheets of glass on the lower ones to form shelves for house plants (Ivy, *Philodendron*, *Maranta*, *Peperomia* and succulents, including cacti). The metal stands can be finished in a similar colour to that used for the tank itself.

Construction of Wooden Stands

Wooden stands can be effective as the photograph on this page shows. These may be constructed at home and stained and polished to match other furniture in the room.

For those who like something just a little more unusual it might be worth considering building a special cabinet which will house the aquarium and, in addition, a radiogram, cocktail server or bookcase. As an alternative, recesses can



be partitioned off, using such materials as hardboard and plywood, with apertures through which the tanks can be viewed. An example of this set-up is shown on the next page.

Some people even go so far as to utilise the partitioning wall in a house, say, between the entrance hall and lounge, so that the aquarium can be viewed from two sides. If arrangements are made with the builders when the house is being constructed for an aperture of agreed dimensions to be left, then the tank can slide in and picture framing used to hide the edges of the aperture and the tank frame. The cost of a supported aperture being made after the house has been built will be higher.



Left: A recess partitioned off to take two aquaria, a radio and a cupboard in the home of Mr. Ronald Richardson, Castleford, Yorkshire.



Right: Two-tier angle-iron stand of orthodox style with a 24 x 12 x 12 in. aquarium on the top shelf. A semi-circular metal light shade is in position.

One important consideration is that a tank which can be seen from both sides is somewhat difficult to set up. The centre of the tank should be thickly set with the taller plants so that the back glass is masked from either side.

For all these ornate arrangements there are firms which specialise in their erection and, if it is thought that the work is beyond one's capabilities, these people should be contacted.

For illuminating the aquarium there is a variety of light hood designs. Without much doubt the metal canopy which completely covers the tank is the ideal so far as appearance is concerned. It is better if the lower, inner surface is fitted with metal tags so that a sheet of glass can slide in under the bulb. In this way condensation on the electric bulb sockets is considerably reduced.

Strip Shade Design

An effective and rather cheaper alternative is shown in the right-hand picture above. It consists of a glass sheet over the tank top forming a complete cover except for one corner, large enough to allow the heater cable, thermostat tube and aerator tubing to be introduced. Even where none of this apparatus is used, a corner of the top-glass should still be cut off, or the glass raised on special corner fittings, to allow air to have access to the water surface. On this glass top a semi-circular metal light shade is rested. These can be purchased for a moderate figure and are entirely effective.

It is possible to make such a fitment oneself, either using metal guttering and fitting wooden ends to it, or by employing thin metal sheeting which is bent and then screwed on the wooden ends. The shaped wooden pieces should have round holes drilled in them—one in each end—to take the light sockets. A bulb can then be plugged in each so that there is even light dispersal. Alternatively, a-strip light may be used. Whichever light shade is chosen, the finish can be identical to that of the aquarium and stand. For the inner reflecting surface white paint is best unless the metal is polished.

The position of the aquarium materially affects the eventual appearance. Many people think that a window-sill is best but, if it receives a considerable amount of sunshine, the water will turn green quickly and spoil the effect. No doubt a position where a certain, but not excessive, amount of daylight penetrates is preferable. To keep the plants in good health, some 6-8 hours of artificial illumination daily will be needed, but the daylight will also assist in maintaining their condition.

If, as so frequently happens, the spot in which you wish to keep the aquarium is in the darkest corner of the room do not be too concerned. Quite a number of plants will thrive under entirely artificial illumination but, of course, the light should be on for a reasonable period each day—say 8-10 hours.

"Aren't They Cute!"



We hope these Perch will not have to stay long in their rather unsuitable container but, while they do, they can be sure of an enthusiastic one-lady interest. Two of the fish seem to find Junior Miss worth a closer look—and who can blame them?

Effecting Economy when

Wimbledon Aquarist Gives
Efficient Yet Money-saving



Above: Tools used for pond building. Behind them are breeze blocks which can be temporarily employed as shuttering material.

Left: Stones and bricks are broken up by Mr. S. J. Freeman before being used in the main concrete mix.



Above: The dry ingredients of the concrete are very thoroughly mixed.

Left: Water is added and the mixture worked well before being laid.

STAN Freeman of Wimbledon, South London, started his pond building modestly with just two informal pools of average dimensions. But any who know Mr. Freeman will understand that his glory in honest-to-goodness graft soon took possession of him and, after careful thought and a heart-fainting amount of physical effort, he now has three further ponds of really large proportions nearing completion. When visiting his home to see how the work was progressing we acknowledged that the scope of his venture was a little beyond the physical capabilities of most aquarists. Those who have seen him manhandle with ease a 24 x 15 x 12 in. tank full of water at a show will realise what we mean.

But whilst we viewed his proud achievement Mr. Freeman gave us more than a few hints and tips which should prove of value to all prospective pondbuilders. For Mr. Freeman's ideas are never costly, he is a master of improvisation, and for those who have wanted a pool in their garden but have been disheartened by the cost, his novel methods of utilising all available materials and actually buying only the real essentials will have immediate appeal.

Proportions for the Main Mix

Mr. Freeman uses a mixture of four bucketfuls of bricks or stones (which should be broken up so that the individual pieces do not exceed 2 in.), three bucketfuls of sharp sand and one bucketful of cement for the main concreting. It will be noticed that broken bricks or stones are used in place of the ballast normally recommended. They have been found a thoroughly efficient, and naturally cheaper, alternative. Old broken bricks and rubble can be purchased from demolition firms and stones from your own and neighbours' gardens are always to hand.

For the base of the pond an eight-inch thickness of concrete is not excessive. In Mr. Freeman's estimation and, as reinforcement, he incorporates any metal webbing or strips which are available. An important point is to keep all tools clean whilst work is in progress.

The dry constituents of the concrete should be mixed together really thoroughly. When water is added to the mixture it should be done gradually with continuous mixing the whole time. Whilst the material should not be excessively wet, similarly it should not be too dry otherwise an extremely uneven—as distinct from the required roughish—surface will be obtained. However if, in the early stages, the mixture is used rather too dry a really good finishing coat of concrete (described later) will usually rectify any weaknesses which could develop.

Bricks are often used for the sides of a pond—built up in the form of walls with a rendering coat of concrete over them. Such construction for largish ponds can prove expensive but, this apart, Mr. Freeman still does not favour their use. Having a large number of old bricks at his disposal he built some of the pond walls with them but found them too porous to give a satisfactory finish and the remainder were broken up for use in the concrete mixture in place of ballast. If bricks are employed for the pond sides they should be thoroughly dampened before being laid and, later, when the rendering coat is applied.

The widespread use of bricks for pond walls has largely come about because of the high cost of timber for the shuttering which is necessary when the structure is of concrete alone. Many photographs and drawings of pond construction—particularly those taken in pre-war days—

Building Garden Pools

Practical Wrinkles on
Methods of Construction

show planks of quite appreciable thickness holding the wet concrete in place. This was all very well in the 1930's when a few shillings spent on timber would have provided enough for the average pond. Those days are over and to see Mr. Freeman's improvisation in this direction is educational. Discused corrugated iron hammered flat, wooden struts of an historic appearance, breeze-blocks eventually to be used for another purpose—all are effectively employed to keep the soggy concrete in place until it is able to stand on its own foundations. Whatever materials are used for shuttering they should not be wet or the concrete will stick. With corrugated iron and wood a thin coat of grease or oil will enable the shuttering to be drawn away with ease. For the walls Mr. Freeman likes a concrete thickness of at least four inches but prefers six.

The concrete must dry slowly so in really hot weather a covering of wet sacking helps whilst the new concrete must be covered if there is any danger of frost. Shuttering may generally be loosened the day after the concrete has been laid as it should then be sufficiently firm. Should the surface appear very smooth small stones can be pressed in or small pieces of concrete can be removed to form a key for the finishing coat.

For the finishing surface the mixture used is one bucketful of cement to two of sand. Mr. Freeman has found this 100 per cent waterproof if floated on $\frac{1}{4}$ in. thick. When dry, two coats of cement wash of medium consistency are applied. Two days later water can be introduced. To neutralize the harmful alkalis which work from the concrete Mr. Freeman adds acetic acid; for a pond measuring 18 ft. x 5 ft. (approximately 700 gallons) he uses one pint.

Planting Sections Only

A last hint which can avoid a great deal of unnecessary labour when cleaning out the pond is to set the plants in special sections of the pond leaving the centre depths clear for the fishes' Winter rest. Do not place plants too closely together, otherwise they will become grossly entangled and cause trouble when altering the arrangement or clearing the pond. The dividing walls for the plant sections need be only $\frac{1}{4}$ in. thick as the pressure on either side is virtually the same and there is practically no uneven stress or strain.

Proof of the efficacy of Mr. Freeman's methods are the large ponds in his garden shortly coming into full use. They are built on practical lines as they are intended for large scale Goldfish breeding. The methods he adopts, however, can equally well be applied when a large or small ornamental pond is being constructed. With Mr. Freeman's co-operation Mr. Laurence Perkins took the photographs used here.

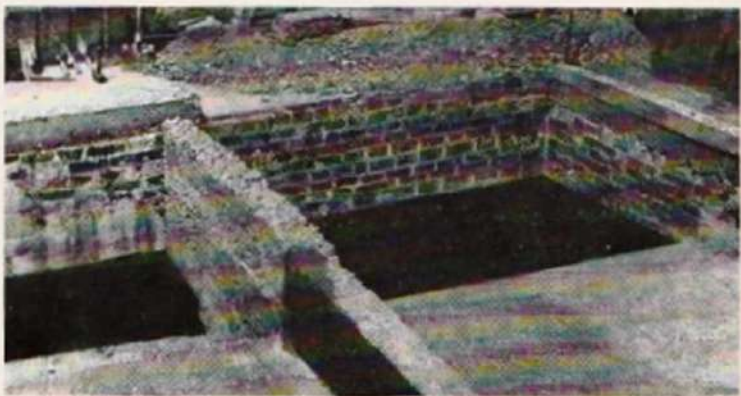
Various forms of pond construction. Brick walls are used for the perimeter. Rendering of the surface is shown to the left. In the centre foreground a concrete wall is being rendered whilst behind it is a very rough section due to the main mix being too dry. It can be remedied by application of a good rendering coat.



Improvisation with shuttering material; flattened corrugated iron and old wood held in place by rocks.



When the concrete is poured in between the shuttering it is pummelled so that no large cavities are left. If wood is used for shuttering it is best to grease or oil it very thinly initially.



Water—the Basis of Fishkeeping

Varying Conditions in Tropical Rivers — Adaptability of Fish —
Unknown Factors Could Be Responsible for Breeding Failures

By WATER LIFE Analyst

THE physico-chemical properties of some natural waters may be extremely complex. Such complicated characteristics are shown by many of the rivers and streams flowing into the Amazon Basin. Inhabiting many of these tributaries are some of the most beautiful species of the New World tropical fish suitable for keeping in small aquaria. In the wild state these fish are prolific, yet in aquaria, even with a simulation as near as possible to that of their natural habitats, many species are difficult to breed, and indeed, with some, successful and consistent breeding results have yet to be recorded.

Examination by chemical analysis of waters from some of the tributaries rising in bogs or cedar swamps feeding the Amazon reveals that they are extremely acidic, with a pH value as low as 3.8 and that they are also heavily contaminated by organic matter of vegetable origin. Because of the presence of a high concentration of organic matter in these waters, very low dissolved oxygen values are recorded. The high acidity and organic contamination of these tributaries are due to the leaching action of the water flowing over waterlogged, peat covered, acid soils.

As distinct from these tributaries in which any existing higher forms of aquatic flora and fauna would be considerably specialised, clear stream waters, from the uplands of the Parima mountain system rising in North-west Brazil, have pH values of 5.0 to 5.5 and a comparatively low organic content. Some of these tributaries passing through rich pasture lands abstract silicic acid from the red clays, whilst ground water continually adds other inorganic nutrient materials along the course of these streams. In addition, organic matter from the tissues of dead animals and plants,

together with excreta, all greatly increase the fertility of the water, which supports a large and varied population of stream phytoplankton and zooplankton, and which in turn helps to maintain an abundance of fish life. These stream waters contain a much higher content of dissolved oxygen than those of the more acidic nature.

These factors—very briefly described—are, along with others, important, for they provide a small clue to the conditions existing in the natural environs of the many species of fish indigenous to a number of the Brazilian streams and rivers. Of course, if it were necessary that all of the factors present in the natural water had to be reproduced in order to keep some of these wild river fish in captivity, the aquarist would at once be confronted with a problem that could not be solved, because many which help to support fish life to perfection in natural habitats are quite unknown in a great number of instances. Fortunately many of the species of tropical fish quickly adapt themselves to changes of environment and even breed in water which is known to be quite different in major physico-chemical characteristics from those prevailing in the native waters.

Neon Tetras, fishes belonging to the *Characidae* Family (Characins), are immediately called to mind as being notable for their outstanding appearance of extreme beauty, but they are also well known for the difficulty they present when trying to breed them under aquaria conditions. Some Continental fish breeders have had a measure of success, however, and a very few British aquarists are getting results (see pages 173-174).

Besides the Neon Tetra many other Characins native to the Amazon are difficult to breed in captivity. Obviously the right set of stimuli necessary for consistent results in breeding is not presented to these fish in captivity. In the wild, breeding stimuli are, of course, always recognised at the right physiological moment. The stimulus may be presented in the form of a change in the environment which is enough to cause an alteration in the previous activities of the fishes. Thus a sudden difference in salinity of the water, a seasonal change in temperature, or even the quality of illumination, or a combination of these factors, may bring on the inducement for driving. These are all simple stimuli immediately recognisable and easily interpreted and acted upon by the experienced aquarist.

Possible Misinterpretation

However, breeding stimuli may be presented in the wild in such an elaborate way (or perhaps, worse still, in such a very simple way!), that the signs may be misinterpreted, or even not be identifiable and the essential conditions needed for breeding in captivity cannot even be attempted by the aquarist.

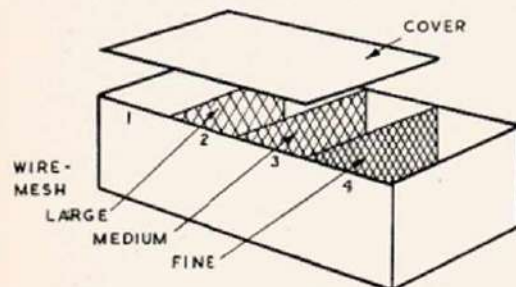
Thus, whilst the physico-chemical characteristics of natural water are important in the natural habitat of fish, it may not be essential that these are the same in water provided for fish kept in aquaria. At first sight this statement could seem to be fairly obvious for it is already well known that most fish are very adaptable to changes in environment. It must not be overlooked, however, that the natural characteristics of the water in which fish are found in the wild, determine the type of plankton which provides food either directly or indirectly for the fish life. This is of major importance and may have a great influence on the urge for breeding. The production of food in the aquarist's tank, however, is only of very minor significance.

Readers' Hints and Tips

Sorting Out Daphnia

I HAVE made a device for the automatic sorting out of *Daphnia* into various sizes. It consists of a zinc box (or a wooden one covered inside with zinc) divided into four compartments with three wire mesh screens, one of large mesh between sections 1 and 2, another of medium mesh between 2 and 3 and a third of fine mesh between 3 and 4. A cover fits over compartments 1-3 and light gains access to divider 4 only.

Daphnia are placed in compartment 1 and, attracted by the light, they try to get into 4 but only those of medium size or less can get into 3, small specimens into 2 and only the very finest ones into 1. Thus the *Daphnia* are ready sorted.—(G. N. Helffer, Paris, France.)



(10s. 6d. is paid for all published hints and tips.)

Australian Frogs as Colourful Pets

Difficult-to-find Members of the Genus *Pseudophryne*

By C. W. Emmens, D.Sc., Ph.D.

(Professor of Veterinary Physiology, University of Sydney)

AUSTRALIA boasts a very rich fauna of frogs, many of which have received almost no scientific attention. Harrison's paper (1922) on the breeding habits of some species still remains the best source of information on that topic.

Many Australian frogs are of a burrowing habit, being rarely seen although often heard, while some can stand a remarkable degree of dryness, almost amounting to desiccation. Of these cryptozoic frogs, the Genus *Pseudophryne* is outstanding. Three species will be described here, all of them small, burrowing frogs with colourful markings. Their size, hardiness, bright colours and general temperament make them first-class pets.

Markings of One Species

Pseudophryne australis (Gray) is about an inch in length at the most, with brown body, slate-grey sides and legs, a T-shaped orange or red mark on the head, various other small red dots or blotches on the body, white spots on the arm and thigh, and white tips to toes and fingers. The belly has black and white markings. It lives in sandstone areas under rocks, fallen trees, or in actual burrows in the soil, usually in the roots of plants. About 20 large eggs are laid, again in a burrow, and are guarded by the female. It breeds at any time of year after a fall of rain. The egg develops out of water, but hatching depends on the egg reaching water either by being pushed in by the mother or being washed in by a further fall of rain. The positions in which some batches of eggs have been found makes it almost certain that the mother frog must push them into water. The tadpole can remain, ready to hatch, for several months, at which stage it already has hind-limb buds.

Pseudophryne bibroni (Günther) is very like *P. australis*; indeed, there has been some discussion about its separate identity. It now seems to be agreed that it is a distinct species and not merely a variety. *P. bibroni* is not found on sandstone, it has yellow markings instead of orange or

red ones, and these have a rather different distribution over the body. No white markings are present. About 100 eggs are laid and left unattended. Breeding is seasonal and takes place in the Autumn. The tadpole takes five to six months to metamorphose instead of the four weeks of *P. australis*. This longer hatching period seems to be associated with the fact that *P. bibroni* lays its eggs near to more permanent water than does *P. australis*, which is liable to deposit its spawn near very temporary water-holes or creeks. The two species are practically never found together.

These frogs are both very attractive, easy to handle, and easy to feed. They eat any small insects and thrive on *Drosophila* (the fruit fly) or small ants. I trap ants by leaving a pot with meat or fruit near to their nest and place it in the frogs' quarters when several hundred ants have accumulated. This, several times a day, feeds 50 to 100 frogs. They do not like being in water and actively avoid it; it is only the tadpole that needs it. Their home should therefore be damp but not wet, with a little pool for any breeding they may care to do. Both species are probably quite plentiful in the wild, although not often seen and not easily caught because of their burrowing habits. In captivity they soon become very tame and do not hide away once they learn that a pot of ants is awaiting their attention above deck. On the contrary, its presence is heralded by a communal croaking and prompt emergence of frogs from various hiding places in the vivarium.

Bright Corroborees

Pseudophryne corroboree (Moore) provides quite another story. It is possibly the most spectacular frog known and also, to date, about the rarest. It was identified by Professor J. A. Moore of Columbia University, New York, on a visit to Australia in 1953. It was known from a single, rather faded, specimen, so far unnamed, in the Australian Museum.



Photographs]

[C. W. Emmens

Pseudophryne corroboree (Moore), said to be "possibly the most spectacular frog known and also, to date, about the rarest."

Professor Moore recognised that it must be a new species of outstanding appearance and, as a result of his efforts, a few others were discovered. Even so, until very recently, only nine had ever been captured. It is another small, cryptozoic frog, rather larger than *P. australis*, about 1½ in. long. Its dorsal surface is striped a vivid yellow-to-orange and black, with white or blue on fingertips and toe-tips. The ventral surface is spotted with black, white, yellow and blue. Some specimens nearly or completely lack the blue markings and are just black, yellow and white on the belly.

Aborigine Connection?

The colouring so resembles an Australian aborigine decked up for a corroboree (ceremonial dance) that one wonders if the tribesmen—who would undoubtedly find the frog much more readily than we do—derived their inspiration from it.

Even more than its fellow members of the Genus, *P. corroboree* does not act like a frog. It rarely hops, but crawls on all fours more like a toad, sometimes right up on its fingertips. It succeeds in looking more like a little striped teddy bear than anything else and, with such attractive habits added to the outstanding colours it possesses, it represents a very desirable pet. Unfortunately, few can hope ever to possess it unless it is found in unexpected abundance in some new locality.

Several Dozen Found

However, a short time ago several dozen *P. corroboree* were found by a friend, who was looking out for them when on holiday because he had seen one or two in the neighbourhood before. They were located in a high mountainous region where he usually takes his vacation and with them were also found two batches of eggs. All the circumstances of this and previous discoveries suggest that the life cycle resembles that of *P. australis*, but the frog is confined to colder areas. Although the adults live quite happily in typical hot Sydney weather, it seems likely that they may need cooler conditions for successful breeding. At present, I have some *P. australis* and *P. corroboree* together in a

(Continued next page.)



Colony of *Pseudophryne australis* and *P. corroboree* frogs, both of which are native to Australia. *P. corroboree* (the striped specimens) generally crawl like toads and rarely hop.

Current Research

Colour Change in the Minnow

By Alastair N. Worden, M.A., B.Sc., M.R.C.V.S., F.R.I.C., M.I.Biol.

THE subject of colour change, and the mechanisms by which it is brought about, are of great interest. As long ago as 1876, Pouchet investigated the colour change of certain Teleost fish, including the turbot and some flat fish, and found that it was under the control of the nervous system. This was confirmed for the Minnow in 1911 by the famous comparative physiologist, Prof. Karl von Frisch, whose contributions to the study of animal behaviour, including the "dances" of the honey bee, are still being made.

Von Frisch showed, as a result of experimental interference, that the nerve fibres responsible for colour change were in tracts which, coming from the brain, pass along the spinal cord the level of, approximately, the 15th vertebra. There they pass into the sympathetic chain and run backwards and forwards, finally reaching the black pigment cells, or melanophores, of the skin through the medium of the spinal nerves (or, in the head region, the trigeminal or 5th cranial nerve). When the path of these nerve fibres was cut at any point, the part of the body thus separated rapidly darkened, and no longer responded to changes of background. Von Frisch noticed, however, that if the Minnow survived the operation,

and was kept on a white background, the dark region resulting from a severance through the side of the body (into the sympathetic chain) gradually became pale. This paling was quite distinct from that which may be caused by interruption of the blood supply. These pale areas, due to the nerve operation, would gradually darken again if the fish was then kept for some time against a black background.

Many other workers have followed up these observations, using not only the Minnow but other species. It was shown in 1918 that adrenalin could cause the pigment cells in *Ameiurus* to aggregate, and later it became clear that in the case of amphibians the colour changes could be controlled by hormones. In 1932, Giesberg carried out experiments which seemed to indicate that the coloured chromatophores in the Minnow did not have any nervous supply but were entirely under the control of hormones secreted by the pituitary gland. Other studies confirmed the findings of von Frisch, but indicated that these slow colour changes in parts of the skin from which the nerve supply had been cut, occurred only if the blood supply was intact. This suggested that the slow changes were brought about by the presence of hormones carried in the blood stream.

The problem has lately been re-investigated by Dr. E. G. Healey, of the University College of Wales, Aberystwyth, whose papers have appeared in the *Bulletin of Animal Behaviour*, the *Journal of Experimental Biology* and elsewhere. His careful work has involved separate operations on different Minnows, with sections of the spinal cord at different levels from the 4th to the 15th vertebra. Records were then made of the times required to reach equilibrium against different (black or white) backgrounds. It was shown that, wherever the level at which the operation had been performed, the times taken for the colour cells to attain equilibrium were very much the same. Without going further into the somewhat complex experimental details, it may be stated that the quite definite colour changes in these operated fish were unrelated to local nervous tissue, and the conclusion is that they must be due entirely to the effects of hormones.

The work was, of course, controlled by observations on normal Minnows not subjected to surgical interference, and interesting variations were observed. The Minnow, like many other animals showing colour change, reacts not only to the tint of the background, but also to the intensity of the light. In some observations that were made on blind fish, this response to light intensity was evident within a few seconds of transference from darkness to light. The Minnow also changes its colour very rapidly on being handled.

The main conclusion is that the rapid changes in colour that occur in such circumstances are due principally to nervous control, although they may be reinforced by the action of hormones. The slow colour change in darkness, such as is seen in the operated fish, but which also occurs naturally, is believed to be due solely to the action of hormones.

Australian Frogs as Colourful Pets

(Continued from previous page.)

large vivarium and frequently see *P. australis* males clasping *P. corroboree* females, although never the reverse. The



Pseudophryne australis (Gray).

consequence of any possible hybridization almost defeats imagination, since their colours and patterns are so different.

REFERENCES

- Harrison, L. (1922). "On the breeding habits of some Australian frogs." *The Australian Zoologist*, 3, 17.
 Moore, J. A. (1953). "A new species of *Pseudophryne* from Victoria." *Proc. Linn. Soc., N.S.W.*, 78, 179.

For Your Bookshelf

Dual Language Volume on Tropical Fish*

MANY aquarists like their reading matter laced with vivid descriptions. For a few moments they like to conjure up the torrid conditions of the Upper Amazon where their favourite Neons originate or they try to visualise dangers which collectors undergo in tropical jungle to bring new colourful fish to aquarium keepers. For these hobbyists Dr. W. Ladiges' book "Tropical Fishes" will have an immediate appeal. Throughout the notes on individual fishes, albeit comparatively brief, come glimpses of Dr. Ladiges' experience in fish collecting.

The book itself is unusually presented, being in German with an unabridged English translation. Misprints do occur in the English text and the publishers apologise for them.

The volume is fully illustrated. Stage-by-stage photographs show the setting up of an aquarium. Others are of plants, which supplement a brief text, and live-foods, diseased fish and fish collecting. All illustrations of fish are drawings, many in black and white and a large number in colour. We must express a preference for photographic studies of fish, resorting to artists' impressions only for special purposes. Whilst many of the illustrations are well executed, others seem hardly to capture the character of the fish portrayed.

Renowned Author

Dr. Ladiges is internationally known in the fishkeeping world and his writings in *WATER LIFE* have been appreciatively received. Differences in classification occur in this volume but they are no more than we would expect in a book from another land. The *Barbus* Genus, particularly, has some discrepancies compared with that used in this country.

A modest fifteen pages at the end is given over to a chapter on breeding fishes of different groups, contributed by Dr. Rolf Geisler. The general instructions contained in it are most useful.

Division of the text so that chapters deal with the fish of a continent rather than a particular group of fishes, gives variety. Species native to Asia, Africa, South America and Australia are treated in this fashion and, in addition, there are sections dealing with Cave Fish, Glass Fish, Dwarf Fish, Luminescent Fish, Leaf Fish and "Living Electric Power Plants"—actually Electric Eels and Catfish. Some of the types covered are in the connoisseur category in this country.

Dr. Ladiges says, in an epilogue, that he has presented the colourful glittering world of aquarium fishes. That his book covers but a cross-section he readily admits, and goes on to point out that larger handbooks are available for those who wish to delve deeper. Viewed from this angle his book will form a useful additional compendium for the aquarists' bookshelf. It has individuality in its approach and format and will no doubt present its readers with a new facet to their knowledge of the fishes they keep.

"Tropical Fishes" by Dr. Werner Ladiges with appendix by Dr. R. Geisler, 215 pages plus 28 pages in colour. Published by Gonsch-Wenzel and Son, Braunschweig, Germany. DM.19.80.



The Editor is not responsible for the opinions expressed by correspondents.

DAPHNIA DEFENDED

Sir,—Having read Mr. W. J. Burns' article "Achieving Success when Breeding Shubunkins" (WATER LIFE, June, 1955), I feel I must spring to the defence of *Daphnia* which he maligns in a new way by associating their use with the appearance of gill worms. This is a wrong assumption, for at no stage of their life cycle are gill worms parasitic or ectoparasitic upon these useful crustaceans, and in no other way could *Daphnia* be responsible for their introduction to the fishes.

Mr. Burns must view with suspicion nothing but his fishes for they are the carriers of larval and adult "worms." Small wonder they persist if he treats the real gill worms, the egg-laying, four-eyed *Theridion*, with Dettol. A solution strong enough to kill every fish in his possession will do little but irritate these killers of fry.

Should he mean by gill worm the skin and finfluke, the livebearing *Gyrodactylus*, however, then he can completely eradicate them with one or two Dettol baths, of the right strength, as stated in my articles on these pests.

C. E. C. COLLI
Hford,
Essex.

HERTELIANA IN BLOOM

Sir,—You may be pleased to record what I believe is the first time that *Cryptocoryne herteliana* has flowered in this country. The flowering of *C. griffithii* is fairly common but I have not heard of any other *Cryptocoryne* species doing so in an aquarium.

The plant which has bloomed is a magnificent specimen which gained fourth prize at the 1954 N.A.S. show. The trumpet is about 18 in. high on a short stem. Where the trumpet joins it, the stem, which is about 1 in. long, is $\frac{3}{8}$ in. thick and is bulbous at the joint. The stem grows from the side of the plant, not directly from the centre. It has reddish brown mottling, except for the bulbous part which is creamy white.

The trumpet itself has ribs that are slightly spiralled for the most part but acutely so for the last 3 in. It is about $\frac{1}{2}$ in. wide at the base and tapers to a point. The colour is basically cream to white, with the ribs of a light brown shade, gradually darkening as they near the tapered tip. Where they are acutely spiralled the ribs are joined, making the shade a dark brown, becoming almost black, at the tip. The plant is set in sand 1 in. deep in a 24 x 15 in. tank. An inverted empty tank has been placed over the top of the plant to get the necessary humidity.

The specimen was obtained about three years ago as a small runner, not more than $\frac{1}{2}$ in. high. The leaves are now 10 in.

long and the plant stretches almost from one side to the other of the tank. Plenty of growing space has always been provided, there being only a few small *C. herteliana* in with it. It has plenty of daylight but has been shielded from the hot sun.

Runners have been taken almost as soon as they have rooted and this has undoubtedly helped to build up the parent plant. Temperature has varied between 70 and 75 deg. F. The water, which is strongly alkaline, was taken straight from the tap.

I keep a lot of tropical Catfish (*Corydoras* species). These are fed very heavily with White Worms. The ensuing mulm is plentiful. I never wash my compost but sterilise it by baking. When planting tanks, I use old compost which is heavily impregnated with mulm. It is a mistake to wash compost to get it clean; by doing so you dispose of a fertile content which is of such great benefit to plants.

I never use compost more than one inch deep, to ensure that the roots of the *Cryptocoryne* plants are not overworked in keeping the sand clean. Consequently, I do not get black sand, despite such heavy feeding. No plants other than *Cryptocoryne* species are now kept by me.
F. ARNOLD
Forest Gate,
London, E.7.

(Since writing this letter, Mr. Arnold has reported that the degree of humidity was apparently in excess of the plant's requirements. The flower died off very quickly and decomposed. This, disappointing in itself, does not detract however from the fact that to get the specimen to bloom at all and to grow to such an extent was an achievement.—Ed.)

TREATING NEW PONDS

Sir,—I note that permanganate of potash is roundly condemned in the June issue by your Analyst. I agree that this chemical will not neutralise the free lime that escapes and dissolves out of the new cement. It has not been claimed to do so. Potassium permanganate does, however, provide an effective seal against this release of lime.

I have used the chemical for the past 25 years in rendering ponds and limestone rocks safe for use. I have also used it to clean out a tank after White Spot or other troubles and in each case it has proved itself worthy. In the latter case plant life seems to develop much more readily.

"Maturing" a pond by frequently emptying and filling with water is a very slap-dash way, and it is doubtful whether it will achieve the desired result. Scrubbing the sides lengthens the process and serves no useful end. So far as acid is concerned, I am reluctant to use it where fish are to be kept.

The following procedure is recommended:—Fill the pond or tank with water

and add permanganate of potash, preferably in solution by the addition of boiling or hot water first, until the water is a very deep purple. Use about 1 oz. to 250 gallons. Stir well. Allow the solution to settle until the familiar brown deposit has formed, which usually takes 4 to 5 days, and then leave it for a further two days. Empty; swill the sides thoroughly with clean water and empty again. Dry out with a clean rag. Repeat the process. Make sure that all trace of the chemical has been removed by partially filling again with clean water and emptying, drying the surplus with a rag as before. The fish can then be put in.

A rendering coat of three parts sand and one part cement that is treated with one of the known brands of waterproofing compounds is essential and reduces the need for curing the concrete even more.

After the rendering coat has been applied, allow it to dry off for 1-3 hours so that the initial set has taken hold and then smooth it over carefully with a metal float or trowel. This will give a sealing glaze to the finish, and will give a smooth finish instead of a rough one.

As soon as the concrete is just firm to the touch (4-8 hours), the pond should be carefully filled and left for 3-4 days. This will slow down the final set and give a better concrete. The first 48 hours or thereabouts give the quickest rate of set, although concrete will continue to harden for years.
Blackburn,
Lancs.

BRIAN J. NIELD

MODIFIED LEAF FORM

Sir,—Three years ago I bought some *Sagittaria natans* for a coldwater tank. The plants had long stems with small oval leaves which floated on top of the water.

About a year later I thought I would try the plants in a tropical aquarium. They died down soon after they had been transplanted. Six weeks later new shoots came up but the leaves were long and thin, more like Tape Grass, and they are still growing well.

Some twelve months ago, my daughter asked for plants for her coldwater tank and I gave her some of the *Sagittaria* from my tropical aquarium. They have flourished but the strange thing is that these same plants are gradually reverting in shape to their original form with the extended stems bearing small leaves.
Nuneaton,
Warwicks.

J. WATKINS

(The *Sagittarias* are noted for diversity in shape of the foliage in different species and for the modifications between underwater, surface and aerial growth. *S. natans* varies considerably in form in different environments and it would seem that the stock owned by our reader develops typical surface leaves under low temperature conditions but manifests normal submerged growth when in a tropical tank.—Ed.)

BLACK ANGELS

Sir,—Rumours are circulating of the existence of a "Dutch Black Angel Fish." The consensus of opinion seems to be that the fish is a melanistic mutation or variegation of the common *Pterophyllum eimekei* rather than a new or different species. Can you confirm or deny these rumours?
Iselin,
New Jersey, U.S.A.

D. FERGUSON

(We hope to publish details received from Mr. G. Wolfsheimer of Sherman Oaks, California, of a black strain of *Pterophyllum* in our next issue. Specimens were exhibited at the 1955 Los Angeles Hobby Show.—Ed.)

PROBLEMS ANSWERED

Queries are answered free of charge by a panel of experts. They should be sent to "Water Life," Dorset House, Stamford Street, London, S.E.1, together with a stamped, addressed envelope for the reply. All queries are answered direct but a small selection is published below.

Swim-bladder Trouble

One of my two-year-old Goldfish has become ill and I have isolated it from the remaining fish which are in a 340 gallon pond. During the Winter, when the water froze, I melted the ice occasionally. The affected fish floats with its tail in a vertical position and fights to attain a normal level. It is now in a container indoors and the floating action is more obvious after it has been fed (dried food and soaked ans' eggs).—(Miss P.W., Rhyd, Flintshire).

Goldfish are susceptible to swim-bladder trouble, especially in the cold weather, and last Winter was very prolonged. However, this complaint is not contagious and it usually corrects itself when the weather warms up the pond

Is there a Dwarf Cichlid in the Tilapia Genus?—(S.P., Burnley, Lancs.).

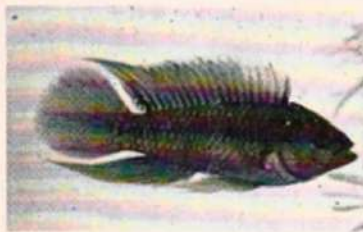
Originally, the name "Dwarf Cichlids" was given to *Apistogramma* species, but it has since become a term used for several other small Cichlids as well. Other species in this category at present obtainable include the *Nannacara anomala* and *Pelmatochromis kribensis*, two very interesting fishes which will repay further study. The Dwarf Cichlids breed in much the same manner as the larger Cichlids, but they do not tear up and destroy all plants. The breeding pair should be conditioned on livefood, such as chopped Earthworms, *Daphnia*, mosquito larvæ, White Worms, etc., in a tank which contains a small flowerpot lying on its side.

is not necessary to feed Infusoria. The tank should be in a shaded position and the temperature maintained at 82 to 85 deg. F. during the whole breeding process. We do not know of any dwarf *Tilapia* species, but the Egyptian Mouthbreeder, *Haplochromis multicolor*, is a small fish which has peaceful habits and is very easily bred and reared. This species is one of the most fascinating of all the tropicals in its breeding habits.

Guppies Dying

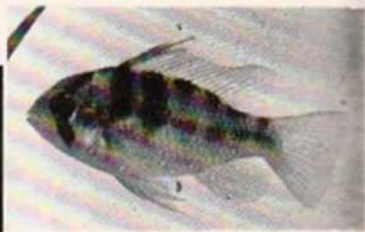
Only the male Guppies in my tanks seem afflicted by a trouble which shows itself externally as a bulge from forward of the gonopodium. This frequently disappears, but the fish generally die within a few days. Diet consists of several kinds of dried foods and occasional feeds of *Daphnia* and White Worms.—(K.F.W., Aylesbury, Bucks.).

The trouble you are experiencing with your male Guppies is probably due to an infection of the intestine due to difficulty



Photographs]

Above: Male specimen of one of the more newly-introduced species, *A. reitzigi*.



[G. J. M. Timmerman

Left: Pair of *Haplochromis multicolor* (upper fish, male). Above: *A. ramirezi*.

water. It is not a good thing to feed dried foods to the affected fish, as this tends to make matters worse. Tiny chopped Earthworms are best.

Breeding Axolotls

Can you give the optimum breeding temperature for Axolotls and the minimum temperature the adults can safely withstand?—(B.W.J., London, N.20).

Our experience is that Axolotls live best in cool surroundings. Specimens have, in fact, wintered safely in garden ponds under ice, and during the severe weather last year, were actually frozen in solid ice for a short spell. We usually aim at an average yearly temperature of between 40 and 60 deg. F. During hot weather keep the specimens in a cool and shady spot. They breed fairly regularly, but there seems to be no particular cycle for this. It is usually a matter of bringing them into condition. The Axolotls should be fed well on a variety of small water creatures, Earthworms and raw meat. When it is hoped to breed them transfer the creatures to a different aquarium of cool water with plenty of water plants. This seems to stimulate sexual activity, and eggs are usually laid.

Dwarf Cichlids

I have Dwarf Cichlids of the following species—*Apistogramma agassizi*, *A. pertense*, *A. ramirezi* and *A. reitzigi*—but am given to understand that there are quite a number of others. Could you give me their names and also some details on breeding members of this group?

When the pair come into condition the male becomes rather antagonistic towards the female and eventually entices her into the flowerpot where the eggs are laid inside and fertilised by the male in the normal Cichlid manner.

The eggs having been deposited, the female now takes over the task of protecting them from all comers. She becomes extremely antagonistic towards the male at this stage, and he is best removed. The eggs hatch in about 48 hours and the fry are free-swimming in a further 24 hours. Then the female should be removed as she may attack the young. The fry can take Brine Shrimps at a very early age, and it

of digestion. Male Guppies are sometimes affected with this disorder due to the weakness of strain and to intense inbreeding. The long-term answer is to obtain a good male Guppy from another known strain of the same type and to mate it with one of your virgin females, thus getting new blood into your fish. You may find that the addition of a tiny pinch of Epsom-salt to the dried food once or twice a week will relieve the fish already affected, although this cannot prevent a recurrence. Your general feeding appears to be quite correct but, for the Guppies and Swordtails, try an occasional addition of a little boiled spinach.

WATER ANALYSIS

Samples should be sent (NOT delivered by hand) in a clean pint bottle, well packed, to Water Life Analyst, 12, Featherbed Lane, Addington, Surrey, together with a fee of 5s. per sample. Name and address of the sender and details of prevailing conditions should accompany each sample sent.

Sample received from W.A., Musselburgh, Scotland. Taken from an aquarium containing Blue Gouramies, Guppies, Platies, Black Mollies and a Beacon Fish. Previously these fish, with the exception of the Beacon, had almost died in apparently similar water although when it was completely renewed they had fully recovered. On an earlier occasion Red Swordtails, Harlequins, Angels and Guppies had been lost. The fish closed all their fins and adopted unusual movements whilst struggling to the surface. The Beacon Fish (*Hypessobrycon occl-*

lifer) was entirely unaffected both times.

Test for impurities:—Appearance: clear. Odour: none. Total hardness as calcium carbonate: 10.8 parts per 100,000. Organic matter: very low, satisfactory. Nitrogen compounds: 0.018 parts per 100,000, satisfactory. Ammonium compounds: 0.004 parts per 100,000, satisfactory. Chlorine, as salt: 1.8 parts per 100,000.

Suggested corrections:—The results obtained from the chemical analysis of this sample of tank water reveal that it is of high organic purity and that it is fairly soft in character. It is suitable for supporting fish life. No information was given regarding the size of the tank or the number of fishes, but from the distress symptoms described it would seem that lack of dissolved oxygen in the water, perhaps due to overcrowding, could have been the primary cause of their death.

In and Around the Aquaria World

— By W. J. Page —

THIS year, flowers and plants were developing late and some exhibitors at Chelsea Flower Show had to leave the setting up of their exhibits until the last possible minute. Even so, the water and rock gardens were made to look most attractive. Whilst looking over the display arranged by Winkfield Manor Nurseries, I was approached by a party of four who turned out to be visitors from South Australia, each with a special interest in aquatic plants. They were Mr. and Mrs. E. A. Lasscock of Lockleys and Mr. and Mrs. G. Thompson of Adelaide.

Mr. Lasscock is the owner of Lasscock's Nurseries, which supplies land, marginal and water plants to Adelaide and other towns and cities in South Australia. Mr. Thompson, a noted horticulturist, was the winner of a gardens competition in Adelaide and district last year. His design included a pond and gained most marks in a competition which attracted entries from a record number of garden enthusiasts.

MUCH hard work has been put into the organisation of the World Union of Aquarists. Meetings have been held to which all countries known to have aquarists' organisations have been invited. Great Britain has been to the fore in supporting the Union, to which belong the federations of Belgium, France, Germany, Holland and Switzerland. Interest has also been shown by some of the Scandinavian countries.

News has been received from America that an International Federation of Aquarium Societies has been inaugurated. It would seem that, solely through geographical limitations, the World Union is resolving primarily into a European Federation and I doubt very much whether the new Federation will attract much support from this side of the Atlantic, whereas it will probably get affiliations from the countries of South America as well as the United States, and possibly Canada.

I may be wrong but the older established organisation with its administrative offices in the Netherlands might become known as the Union of Old World Aquarists, the American sponsored venture developing into a Federation of New World aquarists' organisations.

THE report on page 198 of the eighth annual exhibition organised by the National Aquarists' Society shows that from the exhibitors' point of view it was an undoubted success. As on previous occasions, competition was keen, the 40 or more classes were well supported and the exhibits themselves were of good quality as well as in variety.

There are those who are going about saying that the show was a failure. Let us see the position in true perspective. For three successive years the N.A.S. has experienced misfortunes that could, but I hope will not, cause the organisers to feel that they cannot undertake an open exhibition of the same calibre next year.

In 1953 everybody, including myself, thought that the Coronation crowds would



Mr. E. A. Lasscock (right) with Mrs. Lasscock and Mr. G. Thompson, from South Australia, at the 1955 Chelsea Show.

spare time to visit the exhibition, but the counter-attractions proved too great. Last year the appalling weather kept people away, and now in 1955 I can but repeat what is common knowledge, namely, that the rail strike took its toll.

Those who would usually have spent an evening at the show, going home by a late train, were afraid to venture up to town in case they could not get back again, whilst clubs who usually come up in large parties found either that there were no trains or that the coaches usually available were engaged on emergency public transport work.

I am not minimising the efforts made by some of the more keen provincial aquarists to be present and I was, indeed, pleased to note visitors from as wide a field as South Wales, Dorset, Birmingham, Nottingham, Bristol and Leicester. Some risked travelling by one of the infrequent trains,

the organisers to be wary of another venture.

I hope it will be possible for some arrangement to be made that will make sure of a 1956 event at least. The aquaria hobby without an annual exhibition of this kind would be unthinkable.

FORMER superintendent of the London Zoo, Mr. George Cansdale has remained in the public eye as a television lecturer. In the aquaria world he has been in demand to open shows and has accepted honorary positions with more than one society.

A recent appointment is that of technical director of a new Children's Zoo which was opened in July at Sandown in the Isle of Wight. During the opening ceremony Mr. Cansdale gave estimates of the numbers of people who keep mammals, fishes, reptiles, amphibians and birds as pets. They confirm the belief that we are a nation of pet-keepers.

I anticipate that this latest attraction to Vectis, which has long been a popular holiday playground, will draw many children and parents during their stay on the Island. The new Zoo is by no means complete. A development already visualised is the inclusion of a display of fishes as well as amphibians and reptiles.

A WELL-KNOWN trader had the wisdom to take a young man under his wing to train him as a dealer and breeder of fish. A legally-binding form of apprenticeship was drawn up and the training started. With two of the five years' period expired, a formal request was made for the deferment of the apprentice's



Mr. Kenneth G. Hayes, U.K. agent for the Danish products bearing the trade name Hykro, welcomes Mr. Jorgen D. Scheel, First Secretary to the Danish Embassy, at Hykro stand at the National Aquarists' Society show.

bringing their entries with them, others were carloads acting as representatives from those centres whence we had expected large contingents. The total attendance was smaller than the number needed to meet the heavy expenses involved in staging a show of this size.

All who have exhibited at N.A.S. events know the efforts put into them by the society's committee and members. It seems most probable that there will be an adverse balance sheet, the loss reducing the society's funds to a very low total. The hobby at large will agree with me when I say it would be a great pity were the setbacks over the past three years to cause

National Service. The application has not yet been finally rejected, but is likely to be, on the grounds that the aquatic trade has not adopted an official scheme of apprenticeship.

It occurs to me that were such an organisation as the Pet Trade Association, to sponsor a scheme that the National Service authorities would recognise, they would be doing many traders a good turn. Such a scheme would encourage young people to enter the trade; it would prevent or reduce the leakage that now occurs and, if deferment were to become the accepted practice, the employers with apprentices

(Continued next page.)



PAKISTAN SHOW WINNER

The Hon. Mohammed Ali, the Prime Minister of Pakistan presents WATER LIFE diploma to Mr. Agha M. Jaffri who exhibited the best furnished aquarium cabinet at the successful show of the Pakistan A.S.

In and Around the Aquaria World

(Continued from page 193.)

would be assured of adequate time in which their young assistants would get to know all aspects of pet trading.

Equally important is the fact that, having completed his training, the young man would enter his period of National Service knowing that on his release he could return to the trader ready to take up employment as a fully qualified assistant.

REACTIONS to the interim decisions taken at the annual meeting of the Goldfish Society (reported on page 203) will differ. With a few alterations, the existing four basic varieties are likely to remain but it is possible that an equal number of new ones will be submitted.

The committee has been left to sort out the different points of view. It will be interesting to learn their recommendations and, equally, the reception they receive from the members.

Perhaps the position will be the better appreciated when it is explained that whilst the society's aims are to pursue the scientific rather than the popular approach to the study of the Goldfish and the breeding of its varieties, its proceedings are of a democratic nature, for its constitu-

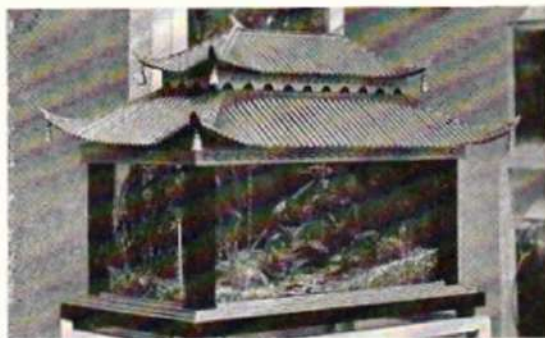
tion permits all members, whether possessing technical qualifications or not, to have an equal vote.

The society believes that its programme is necessary if the cult of the Goldfish is to be kept within bounds and it is that policy which has made it difficult for any negotiations over changes to standards approved elsewhere to be successfully concluded.

At first sight, the A.G.M. report might seem to indicate a withdrawal from the society's original stand but those present will know that this is not so. Rather they will agree that the society is progressive

NOVEL EASTERN DESIGN

This ornate design for an aquarium and shade took the eye at the N.A.S. Show. Painstakingly made out of hundreds of small pieces of bamboo, the shade resembles the typical pagoda-like curved roofing of buildings seen in the Oriental countries.



Women are entering the gardening profession in numbers these days. Here 19-year-old Pat Fitzgibbon of South Harrow, a trainee, services the lily-pond at a Wembley Park.

enough to recognise when they must make additions to their number of accepted separate varieties but that it would be difficult to champion intermediate forms without giving up some of its principles.

IT was a pleasure to go West a short while ago; that is to say, to travel to Hants, and Dorset to meet aquarists there. En route, a stop at Basingstoke enabled me to meet Mr. M. G. Weller, secretary of the local society which has relatively small numbers but consists of some very keen fishkeepers.

At Bournemouth later in the day, first I contacted my host for the night, Mr. L. Ogilvy-Morris, a Ministry of Agriculture and Fisheries officer, who is chairman of the British Marine Aquarists' Society. The drive from the road to his house at Parkstone was overshadowed by a sizeable motor vessel resting on stocks beside the house. Later I saw part of its engine on the bench of his well kept attic workshop. Repairs finished, the sturdy craft will again be used to explore the waters of Parkstone Harbour in order to get new specimens for its owner's marine aquariums.

From Parkstone to Bournemouth after a pleasant meal enabled me to meet

members of Bournemouth Aquarists' Club at a specially convened meeting. This society has an energetic band of officials. The secretary, Mr. R. Matley, and his colleagues, had everything well planned and an epidiascope placed at my disposal enabled me to show numerous photographs to illustrate the talk I had prepared. The club attracts members from a wide area and those who exhibit fishes at shows have had their measure of success.

Next day, I went on through Poole to Weymouth and first went to the Weymouth Aquatic Society's headquarters at the Training College in Dorchester Road. Here I met the chairman, Mr. Baker, who holds a resident appointment as a science master. Both in the spacious laboratories and his house, Mr. Baker keeps and breeds a large number of tropicals.

Later Mrs. K. N. Falla, the secretary and her husband, together with a large number of other members, came along and an enjoyable evening was spent. Again an epidiascope was available and I was able to show a series of pictures to add weight to my notes on aquarium fishes.

SOME time ago I went to the Eastern Counties Section of the Federation of Guppy Breeders' Societies and gave an informal talk. Bearing in mind that I know relatively little about *Lebistes* and its ways

I felt that I was perhaps sticking my neck out in commenting on existing Guppy standards and in daring to advocate paying greater attention to colour breeding. Instead Mr. H. S. White said I had dealt with a subject he had wanted to put forward for some time, and last month there was a repeat invitation to lecture.

The journey over to East Ham meant a welcome at the same headquarters where there was the usual pleasant atmosphere.

Business disposed of, I was invited to speak on "Colour in the Guppy" and endeavoured to show the complexities to be overcome when trying to control colour ranges and colour patterns when breeding from fish possessing the necessary factors for shape, size and finnage development.

A special class in the table show was one for colour irrespective of type and the good entry showed what possibilities there are in this direction. The winning specimen had colours in variety and a well defined pattern of black dots on the caudal fin. Others displayed attractive colour patterns. The judges worked to a specially devised system of pointing and I believe that classes for colour may be advocated at the next F.G.B.S. assembly as an additional attraction at recognised Guppy shows.

Aquatic Press Topics

Potential Source of Large-size Livefood

BRINGING up Brine Shrimps to maturity is a problem which many of us have given up trying to solve. The youngsters hop from their eggs with apparent ease, but as for developing into adults that seems to be beyond their capacity in our jars. Iva Kent is reported to have been successful by Connie Wilson in the April issue of THE TROPICAL FISH HOBBYIST (U.S.). She recommends filling a wide-mouthed jar to its shoulder with a solution consisting of one cupful of rock salt, two tablespoonfuls of Epsom-salt and one tablespoonful of baking soda to each U.S. gallon of water (one U.S. gallon=approx. 4/5ths of an Imperial gallon). A 1/4 teaspoonful of fresh yeast is added and then an eyedropperful of newly-hatched shrimps. The jar is capped but not sealed, and in about a week the shrimps should be of appreciable size. Iva Kent's culture had been going for over two months and some of the grown shrimps fed to her fishes were enthusiastically received. She raised them in a 15-gallon crock containing 12 U.S. gallons of the solution suggested above. To maintain the culture she added yeast in small quantities once or twice a week. Signs were that the adult shrimps were reproducing for there were tiny specimens in with the grown ones.

Previously we have considered attempts to rear Brine Shrimps to maturity as not worth while. Now someone has had success we would like to hear of others experimenting on the same lines. Then we should know whether we can add another entirely safe livefood to the menu of our adult fish.

EARLY Christians adopted a fish as their symbol and reasoning would suggest that there was nothing more natural, when some of the disciples had been fishermen and had been called to become "fishers of men." The true reason is very different, according to Mr. G. H. Meserve, Jr., writing in the March issue of THE AQUARIUM (U.S.). Take the Greek words Iesus Christos Theos Hyios Soter, meaning "Jesus Christ, of God the Son, the Saviour," and, utilising the first one or two letters of each word, ICHTHYS is built up. That is the Greek word for fish—hence the symbol.

NYLON continues to glide its possessive way into every aspect of aquarium keeping. It is now recommended for use in filters instead of glass wool. Although glass wool does its job well, Mr. J. Scheidnass, writing in the May issue of THE AQUARIUM (U.S.), comments on the possible dangers which attend its use—small fragments escaping into the aquarium water and being swallowed by the fish, tiny pieces penetrating one's skin when handling and even floating in the air at the same time. Glass wool for all its dangers—which can be guarded against—is extremely useful and in Gt. Britain at the moment we have no effective alternative. However, Friend Scheidnass has been experimenting and found nylon safe and efficient.

Initially, nylon spawning mops were used in the filters and worked very well. For clearing, the mop could be scalded,

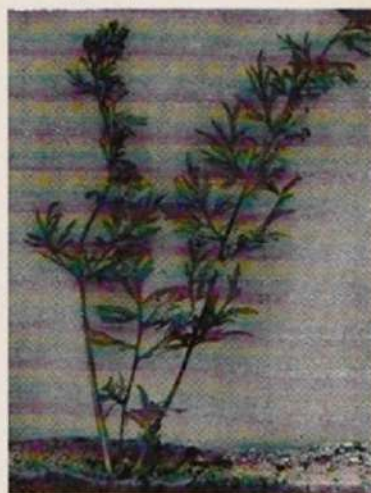
rinsed and then re-used. Later, nylon staple was tried and proved excellent. Mr. Scheidnass goes so far as to say that he believes it to be "destined to replace glass wool in the near future." Details of this staple are that it is white in colour, floats when dry, fluffs up when soaked thus filling all the corners in the filter and that it holds a large amount of mulm etc. before becoming clogged. Due to its expansion when wet only a thin layer is required and a 1/4-ounce packet will cover six filters.

Even though it is economical in use nylon staple could still prove considerably dearer than glass wool in Gt. Britain. We must wait for a final assessment until someone steps into the field commercially.

HINTS for aquarium furnishers are given by Mr. W. Bertholdt in the April issue of THE AQUARIUM JOURNAL (U.S.). For a large show tank he suggests arranging the gravel 1 1/2 in. deep at the front and 3-4 in. at the back. Three dark rocks, between 1-3 in. high, are placed in the left foreground and behind them *Ludwigia* is terraced. To the right of the *Ludwigia* (i.e., in the centre of the tank), Twisted *Vallisneria* is planted with straight *Vallisneria* behind. The Twisted *Vallisneria* is arranged so that an approximately semi-circular area free of plants is present in the foreground. Here small rocks can be positioned or Pygmy Amazon Swords may be introduced. For the right-hand side of the aquarium *Limnophila* (*Ambulia*) is employed. Here, again, the plants are

positioned so that there is a roughly semi-circular clear area in front with a few small rocks set in it.

As Mr. Bertholdt points out, careful planning beforehand is necessary to get the best effect. Combinations for pleasing results are light green *Cabomba* or Indian Fern with dark green Giant *Vallisneria* or Willow Moss. Pale *Cardamine* contrasts well with shaded *Myriophyllum* and *Ludwigia* blends effectively with a large, dark *Cryptocoryne*.



Photograph

[G. J. M. Timmerman

The Indian Fern which Mr. Bertholdt thinks looks well with *Vallisneria* or Willow Moss.

Culture of Unusual Aquatic Plants

WE have received a new German book called "Aquarium Plants," by A. Wendt, in which the thoroughness of the description and the excellency of the pictures make it a volume of real merit. For each plant the author gives details of the botanical Order to which it belongs, a list of other names under which it might be known, place of origin, detailed description of the plant and its habits, hints on culture and propagation, its general use for the aquarist and any other details of special interest.

Among the subjects covered are a few plants which are not generally known and which might be of interest to the aquarist. Plants which form a lawn or the bottom of the tank are always a great attraction. There are several species of the *Elatinaceae* Family which will do well submerged, though they are not really true aquatic plants. The most attractive member of this Family is *Elatine macropoda*, a plant found in parts of France, Spain and other Mediterranean countries. It is very pretty and has a creeping habit, with leaves not unlike those of a miniature privet. The leaves vary between 1/2 and 1 in. in length. The plants form numerous lateral shoots which will also creep along the bottom of the tank provided they are not starved for light. Roots are driven into the ground and reach almost 2 in. long. The plant has no special requirements for water and temperature, but it likes a fair amount of

light and some direct sunlight is beneficial. It does not do very well in pure sand and requires a mixture of sand and clay to flourish. These conditions provided, the species is best started off in four or more different places in the tank. Within four to five months it will have covered the bottom completely. It is recommended that any plant-eating fish and scavengers, as well as bigger snails, be removed from the tank until the plant is well established.

Another *Elatine* Species

A near-relation, *Elatine hydropiper*, differs from *E. macropoda* in so far as the small branches have a tendency to lift their heads above the bottom layer, though not very high, and in that it will produce flowers under water. Though the flowers never open under submerged conditions, the seeds will ripen and can be used, as *Elatine hydropiper* is generally an annual plant.

A bog "Primula" which will stand up well to submerged conditions is *Samolus floribundus*, the green Water Rose. This plant certainly resembles the garden Primula with its light green oval shaped leaves of some 4 in. length and 2 in. width, which form a rosette.

Samolus will grow in ordinary aquarium gravel, but appreciates a light addition of clay. It does best in soft water with

(Continued next page.)

Culture of Unusual Aquatic Plants

(Continued from page 195)

temperatures between 60 and 68 deg. F., if kept in very shallow water and in direct sunlight, the plant will soon start to bloom. Occasionally small plants will form on flowering shoots or on aerial leaves. These can be used for propagation. The plant is a native of the Americas and has been known for many years, but has recently been "rediscovered" by aquarium dealers on the Continent. It has a European relation, *Samolus valerandi*, which inhabits boggy meadows, in particular near the seashore. It will do well in submerged state in the tank, particularly in brackish water. Both plants will stay green all winter under suitable light conditions.

From Continental Journals

German Fishkeeper Breeds Chocolate Gouramies

IN the April issue of DATZ, W. Bahr describes a species of Gourami newly imported into Germany from Malaya which deserves our interest in many respects. The fish, *Spharichthys osphromenoides** is offered by dealers in Germany under the name "*Osphromenus malayanus*." It is a small fish, which does not exceed 1½ in. in length, is of a pleasing coloration and shows three to five irregular shiny white bars on a metallic greenish-brown background. Dorsal and ventral fins are slightly darker than the body colour and have a fine yellow edge. One of the peculiarities of this fish is its method of swimming, for which it uses pectoral fins only.

Preparing the Tank

The breeding of *S. osphromenoides* is most interesting though not without difficulties. Bahr used a standard size tank, approximately 24 in. x 14 in., with only fine sand on the bottom. Water depth in it was 6 in. and it contained only floating Water Fern. Temperature of the water was high, 85-86 deg. F., but details of hardness and pH value are not given. The tank was well covered in order to ensure a high temperature of the air above the water surface as well as of the water itself, an important point with Anabantids which all come up to take air and a cold atmosphere might prove fatal. According to Mr. Bahr the building of the bubble-nest differs from that of other Anabantids. The male fish gets hold of the leaf of a floating plant and blows air bubbles underneath it. The fish adds more and more bubbles until the leaf forms a floating island of some 2½ in. diameter.

*Reference was made to this species on p.141 of our June-July, 1950, issue. It was pointed out then that whilst an American aquarist had bred it in aquaria and found it to be a bubble-nest builder, a fish collector had found alevins in the mouth of an adult specimen and therefore assumed it to be a mouthbreeder. Mr. Bahr's experience, related here, confirms the viewpoint that it does build a bubble-nest but we may find, when more observations are forthcoming, that there are either two species very similar in external appearance but differing in their breeding procedure or, alternatively, that the fish does allow the young fish to take refuge in its mouth when certain conditions prevail, e.g., danger, although it is normally a bubble-nest breeder.—Ed.

Finally, some general hints on the culture of *Aponogeton* plants of all species. The best water is soft, especially rain water, which should not have been in contact with drain-pipes or tarred roofs as either might cause contamination. Acid water is preferable and the tank should be free from algae and floating sediment which might settle on the leaves. The tuber should be embedded in a mixture of gravel, clay and charcoal, 2 to 6 in. deep, according to size, and should be covered with soil approximately its own thickness. The mixture should not be too rich for young and weak plants as a poor planting medium encourages stronger root formation. The clay content should be increased as the plant grows—a rule which applies to all plants. How exactly this increase of the clay proportion can be achieved without replanting completely, will be explained in the next article.

By H. O. Munro

The bubbles are dissimilar to those of other bubble-nest builders, which are covered by a film, and are just air bubbles which join as they touch until they form one large air bubble. The building of the nest is continued for about two days until sufficient air is collected underneath the floating leaf to form an air dome. The male now tries to drive the female underneath the nest. He is rather rough during



Photograph

Harlequin Fish (*Rasbora heteromorpha*) should be allowed to choose their own partners when breeding is contemplated, according to a report in a German journal.

this operation and will even kill an unwilling female. Spawning takes place directly beneath the nest during an embrace. As the eggs of this fish are lighter than water they float into the nest. The male guards the eggs for some three to six days and replenishes the air underneath the "dome." He should be removed when the fry hatch and the female immediately after completion of spawning. First food for the fry, as with related fish, is finest Infusoria and egg powder.

IN a new German publication, called AQUARISTIK, I found an interesting note about the aquatic habits of certain butterflies. In the Family *Pyralidae* there are several which deposit their eggs in the water. The caterpillars build themselves a protective "tent" from leaves and sink to the bottom of the pond where they hiber-

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nate. They rise to the surface in Spring and start to feed on aquatic plants, namely, Water-lilies. Some types develop proper gills.

There are even some species (*Hydrocampina*) where the butterflies themselves move quite adeptly under water when in the process of depositing their eggs.

IT is a well-known fact that Cichlids are quite particular in the choice of their partners, but it seems a new idea to blame difficulties in the breeding of *Rasbora heteromorpha* on the choice of unsuited pairs for the breeding attempt. However, this is the main reason for difficulties experienced with the Harlequin, according to H. Pinter in an article in the May issue of DATZ. Spawning with this species normally takes place after prolonged chasing by the male fish. Only after this

has been going on for some hours will the female normally show willingness to spawn and start on her well-known acrobatics. With a well-suited pair the male will follow the female under the chosen leaf, and in an upside-down position, embrace the female and fertilise the eggs. There are, however, females which will take up a spawning position without any chasing and, more often than not, the male will take no interest in such willing females. On the other hand there are females which are so intimidated by too vigorous courting by the male that no spawning takes place. Pinter suggests that pairs which are temperamentally most suited to each other should be chosen, whether they be both timid or both more temperamental. Once the suited pairs have been selected, he thinks they should be kept apart from other Harlequins for further spawnings.

Sticking Your Nose Into Other People's Business

A Philosophical Approach to Fishkeeping

By W. L. Mandeville

IF we were asked to write an essay on why we keep fishes it is probable that the result would be influenced by our ultimate interest in the hobby. Some might mention beauty, others biology, some pleasure whilst a few would stress profit.

Were we possessed of the rather uncommon gift of self-analysis and if we had the even rarer attribute of always speaking the truth, it might be possible for us to determine the common cause that made us fishkeepers. I venture to suggest that this impulse is ascertainable and is founded on one of the oldest habits of human beings. It is nothing more than the time-honoured tendency to mind someone else's business. Fishkeeping is one of the more respectable forms of it.

We stick our noses to the front panels of our tanks and view the activities of the occupants without qualm, for our conscience is not worried. When we tire of our own aquariums we turn our attention to those of our friends and when that begins to pall, we include our friends themselves in our survey. It is this inquisitiveness that has placed the human race in the forefront of animal creation. Failure to recognise this is, I submit, the cause of some societies losing their influence. They have attempted to confine their lines of enquiry too closely to what the Americans call "the know-how" and have neglected the development of the important social side of society life and of the parallel policy of helping members to investigate why things occur.

Basic Information

When the flood of tropical fishes poured into Britain, once the ban on importations was lifted, many societies were formed on the tide of our quest for knowledge about them. Such basic information as how to maintain tanks, how to induce fishes to spawn, how to rear the fry and the like was sought. They are all useful things to know but they do not take long to learn. True, practical experience comes into the

picture but this can be acquired away from societies and a large field for recruitment is needed if those who have learned and left are to be replaced continually by those who wish to learn and, having become knowledgeable, will leave.

"Hows" and "Whys"

The successful societies are those which, whilst dealing with the "hows" of the beginners, have infused their more advanced members with the desire to study the "whys" and if there is confusion in your mind concerning these two lines of enquiry I would ask you to think of children's questions. "Why does teacher

THE
AUTHOR,
A WELL-
KNOWN
MIDLAND
FANCIER,
LECTURER
AND
JUDGE



write on the blackboard with white chalk?" asks the youngster. Father replies "Because you can see it better". But the youngster knew that and replies with the further question "Why can you see it better?" to which the fount of all wisdom replies "Because white shows up on black" but junior knew that, too, and comes back with "Why does white show up on black?" Father, now a little out of his depth, responds with the stock response, "Don't ask so many silly questions". In fact, the child did not ask many questions; he was concerned with only one thing and his enquiries were not silly but to answer them would have meant dealing with colour or the absence of it and with the reception, rejection and reflection of light. To have

given the correct information simply and accurately would have taken more time, thought and investigation. We can apply the moral to fishkeepers and the societies to which they belong.

When it comes to investigation we can learn much from the patience and industry shown by aquarian naturalists. Their effectiveness is controlled not by numerical strength but by individual activity. Any stretch of water is a happy hunting ground for them. One society of such enthusiasts, co-operating with its local University, has undertaken a survey of the waters in its area. Its chairman has said that it might take one hundred years to complete. Does that indicate any lack of material on which to work?

Pride in the Task

Forty years ago, an enthusiastic naturalist, engaged on a similar survey, impressed me when he claimed that there is a sense of loveliness in walking by the waterside, a sense of pride in having permission to go where others are not allowed access, and a sense of value if you are walking with a purpose, namely collecting, then identifying and subsequently displaying the flora and fauna. Imagine the value to your society if your members carry out such a survey and then arrange a permanent display in the local museum. The public not only learns that there is an active society in their midst but also that there is a world of interest, of which they were almost unaware, in a nearby brook or pond which they have known all their lives.

Some might ask, why have a society at all? It is a good thing for friends with a common interest to gather together; to be able to recite successes or to get comfort in failures. A society makes it possible to iron out perplexities, to give assistance with advice and materials, to enjoy controversies and to join in the aspirations of specialists. Contact with others is an essential part of our lives and the provision of that contact is the purpose of societies.

In the larger sphere, the area associations provide new faces and new voices to assist the interchange of ideas between a group of societies, with the possibility of occasional larger gatherings to give a worthwhile welcome to an authoritative lecturer. Guiding these activities should be a national federation, relieved of the responsibility of catering for society programmes and able to devote its energies to appointing judges, issuing standards, providing the occasional star speakers and assisting the work of area organisations.

The successful societies emphasise that it is activity of a varied nature which has made them grow into influential units and it is the overflow of enthusiasm from them that has been responsible for the appearance of a growing number of local associations. The fact that these area groups are serving a useful purpose implies that, maybe, the name of the Federation of British Aquatic Societies could be changed to the National Federation of Aquarist Associations, with its policy amended accordingly.

From August 24-27 KETTERING A.S. is staging its annual show in the Co-op, and Labour Institute, Newland Street. There are 14 open classes. Further details can be had from Mr. E. J. Eales, 15, West Street, Kettering.

Lament for a Pet Goldfish

— By Capt. L. C. Betts, Goldfish Society's Chairman

THE Chairman mourns the loss of his large and ancient Globe-eye who passed away peacefully in his eighth year. Twice champion and twice runner-up in the society's Annual Show for Globe-eyes this big, well-boned fish started life as a Moor but became a Globe-eye on the formation of the Goldfish Society in 1948. Right to the end this lovable fish retained its black colouring and, whilst its tail shape was not strictly in accordance with the society standard, it was hard to beat in competition and could not be disqualified under the type test.

Toward the end of his long life he constantly reiterated that the later generations were not a patch on his contemporaries. Actually his words were "They don't come as good these days as they did in mine". Whilst he spurned glasses and refused the National Health Service in this

respect, it was obvious his sight was failing as it took him two turns round a 36 in. tank to find a 3 in. Earthworm.

His reproductive powers failed him in the last two years of his life which was due, in some measure, to his partiality for "Betts" pudding. He always preferred a second helping to a "drive" any day. The local urban district council dustcart bore his body reverently to the incinerator. Even the dustman was moved as he carried him and was heard to exclaim to his comrade, who was sorting out a pair of shoes from the ashes, "Blimey Alf what a ruddy stink—something's crawled in here and died." Floreat Pixes—In Memoriam ad nauseum, which roughly translated means "What a pong dead Goldfish give off in hot weather."

(Extracted from the bulletin of the Goldfish Society of Gt. Britain.)

National Aquarists' Society

Good Entry for Eighth Annual Show

New Hall Layout with Central Stands

THAT the hobby needs a show of national standing goes without saying and it is indebted to the National Aquarists' Society for offering facilities to exhibit at an event in the centre of London, during the Summer months. A full classification, attractive prizes, adequate amenities such as are provided at the Horticultural Hall, and a knowledgeable organising committee, combine to give fishkeepers an excellent opportunity of seeing how their fish fare in competition with those of their fellow aquarists.

In previous years we have been accustomed to entering the show hall and seeing a wide expanse of aquariums, with trade exhibits around the walls and the society's own stand centrally disposed. This year there was a departure. A large prefabricated run of shell stands had the effect of dividing the show hall in two. The N.A.S. occupied a position facing the entrance whilst several other spaces were taken by traders. Two positions were used for the N.A.S. Benevolent Fund Competition, and M. & M. Rich displayed shells, and Mr. L. E. Perkins, photographs, in the other.

Trade exhibitors included Messrs. Rymet with tanks, stands and bird cages. Windmill Products and Tachbrook Tropicals had aquarium requisites, plants (including Madagascar Lace Leaf) and fish (among them a five-month old, well-developed Siamese-twin male Guppy owned by Mr. A. Austin) on show. Broad Green Aquarium had indoor plants and fish for sale and also a Chinese pagoda style of decorated tank. The top was made of split bamboo—and the whole set-up was painted appropriately by its designer, Mr. R. Drake of Uckfield, Sussex. Fernwood Aquarium and Nurseries Ltd. displayed fish and plants and WATER LIFE showed its full range of books and booklets. On the central shell stands Kenneth Hayes made an eye-catching display of Hykro Products and Glen Aquaria had plants and fish on show. The effective arrangement of Messrs. Singleton Bros. won the P.T.A. Trophy for this organisation.

Entry and Judges

Entries received totalled well over 900 and although the rail strike was in operation a very large proportion of the total was actually staged. Exhibits were generally of a high quality and it was interesting to see the increased numbers in coldwater classes. Judges were as follows:—Mrs. B. Robertshaw (Barbs, A.O.S. Characin, Breeders' Characins, Breeders' Cyprinids, Club Furn. Trop., Individ. Furn. Trop.), Capt. I. C. Betts (Veils, and Moors, A.O.V. Goldfish, Breeders' Coldw., Club Furn. Coldw., Individ. Furn. Coldw.), Mr. A. Boarder (Common Goldfish, Bristol Shus., London Shus., Fans., Breeders' Coldw., Club Furn. Coldw., Individ. Furn. Coldw.), Mr. E. Bowler (Egglaying Tooth-carps, plant classes), Mr. W. C. Cleveland (plant classes, Breeders' A.O.S. Trop., Club Furn. Trop., Individ. Furn. Trop.), Mr. W. Dacre (British and Foreign Coldw., Breeders' Coldw., Club Furn. Coldw., Individ. Furn. Coldw.),

N.A.S. SHOW VENUE

General view of the Horticultural Hall, Vincent Square, with the N.A.S. show erected. The new range of shell stands were assembled across the width of the Hall.



Mr. J. H. Gloyn (A.O.S. Labyrinth, A.O.S. Cyprinid, A.O.S. Trop., Breeders' Cyprinids, Breeders' Labyrinths, Breeders' A.O.S. Trop., Club Furn. Trop., Individ. Furn. Trop.), Mr. S. Harker (Fighters, Catfish, *Hyphessobrycon*, Breeders' Characins, Breeders' Labyrinths), Mr. P. Hewitt (Cichlids, Dwarf Cichlids, Breeders' Livebearers, Breeders' Characins, Club Furn. Trop., Individ. Furn. Trop.), Mr. C. R. Looker (Swordtails, Platies, Mollys, Breeders' Livebearers) and Mr. H. S. White (Guppy classes and Breeders' Livebearers).

Coldwater Classes

In the Common Goldfish, Mr. F. G. G. Lush's exhibit was a worthy winner with colouring much richer than others in the class. Among the 25 entries Mrs. K. Dietsch was second and Mr. D. S. Ross, third. A smallish Shubunkin owned by Miss D. Morris of good colour but with caudal slightly narrow-forked led the 27 fish in its class. Second was Mr. A. R. Sutton with a fish having a good spread of finnage but the caudal showed a tendency to droop. Third was Mr. R. H. I. Read. The old-stager owned by Mr. S. J. Freeman once again headed nine London Shubunkins with Mr. E. H. Mann, second, and Mr. A. B. Lester, third. There were 25 Fantails and first prize (Mr. V. E. Capaldi) went to a large Scaled specimen of fine quality although the body was rather long. Second was Mr. W. C. Webley and, third, Mr. D. E. Goodbody. First prizewinning Calico Veiltail in the 29-strong class for Veils, and Moors also took the Strachan Kerr Trophy for its exhibitor, Mr. F. T. Barry. Its finnage was nicely finished and it had a good body. Second was Mr. F. D. Balaam's Calico Veil, with not quite the body contour or tail. Mr. O. Taylor's Scaled Veil was third. Only five fish were staged in the A.O.V. Fancy Goldfish class. First was Mr. R. H. I. Read's very good Lionhead. It showed rich colour and fine head-gear but failed on deportment. Mr. R. J. Affleck's Celestial of good size and with well-developed eyes was second and Mr. H. Tisbury's Oranda, third.

Leading fish in the British Coldwater class (21 entries staged) were of commendable standard. First prizewinner was a Golden Rudd in good colour and condition shown by Mr. E. T. Davison. An excellent Green Tench, owned by Mr. T. Sherwood, was second and another

Golden Rudd (Mr. R. Mayersbeth), not quite the colour but larger, was third. Fish of the Sunfish group took all the prizes in the Foreign Coldwater class. Mr. E. G. Harris' first prize-winner, a magnificent specimen, had previously taken best in show award at a Hampstead society's event. The second prizewinner (Mrs. V. Thomas's fish) was not far behind but did not have quite the colour or body depth. Mr. F. K. Oliver was third. Entry No. 5, a Golden Orfe, seemed unlucky not to get a place.

Livebearer Winners

A Red-eyed Red took first prize and the Suregrow Trophy (Mr. R. W. Hall) in the Male Sword. Class. It was a fish of lovely colour and good substance. Second was Mr. C. Loudon's Red Wagtail which was getting nearer to the ideal for this variety. Black in the caudal and sword length were quite good but dorsal and other fins required more colour density. Mr. W. Norcross's Albino was third. A large Red (Mr. S. W. Atkins) was best among the 21 female Swords, and two Blacks, good for this variety, were runners-up for Mr. L. Bowd. Mr. O. Foulsham's very well-coloured and shaped—though smallish—Red, led the Male Platies. Mr. L. W. Thorpe's Red was second. It had quality but not quite the shape or evenness of colour. Another Red, Mr. R. W. Hall's, was third. Of the 33 female Platies staged, Mr. R. W. Hall's Red was leader—a very good fish but colour could have extended more into the fins. Shape of the tail marking in Mr. W. Goodfellow's Red Wagtail (second prizewinner) could have been better but, this apart, it was a fine specimen. An unusual third prizewinner was Mr. L. F. Clement's Golden. It was of good shape and size but colour could have been deeper. Mollys seem to be gaining in popularity and in all-round quality. There were 38 entries in their class and, in future, it might be worth considering two classes, one for each sex. Mr. C. Loudon's Sailfin was first. It carried its showy dorsal well. Second was a Black with beautiful density and—most important—faultless deportment. Mr. G. Gale's Sailfin was third and should develop into a really fine specimen.

Egglayer Exhibits

We liked the leading fish shown by Mrs. I. D. Smith in the Fighter class. It was a Red with nice finnage length and body shape. It failed a little on the trailing edge of the anal and body colour. The same exhibitor's second prizewinner was also a Red with slightly heavier body. Third was Mr. A. S. Osborne. One of the strongest classes was that for A.O.S. Labyrinth with over 30 fish staged. All prizewinners were fish of top quality. First was a Thick-lip (Mr. R. Walford) of good substance and colour. Second and third (Mr. F. Ahrens) were Combtails of quite unusual size and excellent colour. Fourth was a well-coloured Leeri shown by Mr. R. W. Hall. Barbs also provided keen competition with well over 40 fish on view. A Tiger of good size and colour and first-class deportment gained first for Mr. R. W. Hall. Second was Mr. D. W. G. Port's Clown of gorgeous colour and third, Mr. K. D. Fawcett's well-conditioned Cumingi.

A Harlequin (Mr. M. Welch) of exceptional quality led the Danio, Rasbora and White Cloud Class with Mr. G. W. Richardson's faultlessly-conditioned *Rasbora taniata*, second, and Mr.

WINNING TRADE STAND

Messrs. Singleton Bros. gained the P.T.A. Trophy for the best trade exhibit at the N.A.S. event with this pleasingly designed stand to advertise their full range of aquarium equipment.

Photographs]

[WATER LIFE



N.A.S. Show—continued

F. Fox's Pearl Danio, third. Mr. Harry Seombe's Harlequin was fourth. Mr. Seombe, renowned radio and television star, also gained a fourth in the *Hypheosobricon* class with a Neon.

There were variety and entries aplenty among the Catfish. A Talker, put down in near-perfect condition by Mr. S. C. Halsey, was first with *Corydoras (?) rabaudi* (Mr. S. Strelley), second and third. A male Rosaceous (Mr. J. Burge) deservedly led the *Hypheosobricon* class. Its dorsal and anal were beautifully developed and there was nice body depth. Colour did not show too well at the time we viewed. A Serpe was second and a female Rosaceous, third (both Mr. B. J. Wildy). Mr. Wildy was also successful in the A.O.S. Characin class where an interesting entry was staged. His *Chilodus punctatus* came first with an *Anostomus anostomus* (Mr. P. Poor), second, and a Pulcher (Mr. R. Skipper), third.

Over 20 fish were shown in the large Cichlid class where *Aequidens* of quality gained first and second places for Messrs. T. F. Daden and C. P. Stoker, respectively. Third was Mr. R. Walford's Angel, a beautiful fish except that fin filaments could have been better developed. It was encouraging to see a reasonable entry of Dwarf Cichlids where Mr. A. M. Hoare's *Apistogramma reitzigi* led the class followed by Mr. W. T. Cliffe's *Pelmatochromis kiribensis*. Mr. C. P. Stoker was third.

Old favourites now firmly re-established in popularity are the Egglaying Tooth-carp and there were over 20 in their class with four lovely fish in the cards. A really commendable effort was the entry of Mr. M. Witham, which was an *Aphyosemion siersiedti*. It was a worthy first with Mr. F. Ahrens' Lyretail second, Messrs. Deamer Bros. *Epiplatys chaperi*, third, and Mr. Ahrens' *Aplocheilichthys lineatus*, fourth. Another class of exceptional merit was the A.O.S. Tropical where diverse fish jostled for honours. They ranged from Butterfly Fish, American Guppy varieties and Archer Fish, to tropical loaches, Flying Fox and Seals. It was one of these last named which gained a first for Mr. T. W. Brown and it was well deserved. The specimen was in the best condition and of quite exceptional size. The same exhibitor was second with a fine *Monodactylus argenteus*. Third was Mr. K. D. Fawcett's *Osteochilus hasselti*—most unusual—and fourth, Mr. S. C. Halsey's nicely-coloured *Labeo bicolor*.

Guppy Entries

Coloured Female Guppies were well represented with Mr. W. A. Bone's fish taking first place. It had good colour and shape but poor deportment. Second was Mr. P. C. Pavitt and third, Mr. R. Alley. Mr. J. Martin led the A.O.V. Female Guppy class with a fish of clean lines but which could have been larger. First prize male Doublesword (Mr. P. C. Pavitt) was a well-coloured fish of nice development but with its upper sword a little short. The caudal was less developed with swords somewhat thicker in the second prizewinner shown by Mrs. I. D. Smith. The same exhibitor was third. Mr. Pavitt gained a first in the Male Lowerswords with a well coloured fish. The sword was well-grown but blunt-tipped. Second and third was Mr. L. Nadauld. Mr. Pavitt was also first in the male Veiltails with a fish of all-round quality although the caudal could have been longer. Second was Mr. G. E. Boyles, whose fish had greater caudal length but rather ragged termination and the dorsal seemed imperfect. Mr. Boyles was also third. Mr. S. W. Atkins' Scarftail was first in the class for this variety with Mr. P. Edwards, second, and Mrs. I. D. Smith, third. The class for Lyretails and Topwords was combined with that for A.O.V. Males due to lack of entries. First was Mr. A. H. Charles' Cofertail, and second and third Cofertails shown by Messrs. A. Maher and F. Humplidge, respectively.

Plant Classes

Twisted Vallisneria took first three places in the classes for *Vallisneria* and *Sagittaria*. First (Mrs. M. Hall) was very well grown but had poor twisting, second (Mr. T. H. Marshall) had better twisting but was not so clean and third (Mrs. Hall) did not have the growth. *Cabomba*, grown by Mr. K. D. Fawcett, led the class for *Cabomba*, *Ambulia* (*Limnophila*) and *Myriophyllum*. Its fronds were magnificent though rather widely spaced. Very clean *Myriophyllum* was second for Mr. T. H. Marshall and *Ambulia* was

third for Mr. R. G. Mealand. The *Cryptocoryne* class was combined with that for A.O.V. Aquarium Plants and leading exhibit was an *Echinodorus rangeri*. This was a superb plant staged in faultless condition by Mrs. L. F. Bell and it was awarded the Plantsman's Perpetual Challenge Cup. Second was Mr. W. A. Bone's strong *Cryptocoryne griffithii* and third, Mr. R. G. Mealand's clean *Bacopa* (*Hydrotrida*).

Breeders' Teams

Among the coldwater exhibits were Mr. E. F. Dale's Veiltail Moors, very well developed and with colour coming through nicely. They gained a first and also shared the Blair Perpetual Trophy with the Breeders' A.O.S. Trop. Fish class winner. Second was Mr. R. H. I. Read's Calico Veiltail team, good fish but failing on matching. Third were Mr. J. H. Franklin's Scaled Fantails.

Well-developed Red-eyed Red Swords, shown by Mr. R. W. Hall, were first in the Livebearers with Mr. P. C. Pavitt's coloured female Guppies, second, and Mr. E. G. Lynch's Black Mollies, third. A superb team of Neons led the Characin class for Mr. E. G. Lynch. Second were Mr. R. Skipper's Penguins, perfectly matched and conditioned. Mrs. E. A. Allen's Rosy Tetras were third. The Cyprinid class was headed by Mr. E. J. Croucher's White Clouds with neat body shape and good colour. Second were Mr. R. W. Hall's adult Tiger Barbs and third, Messrs. Deamer Bros. White Clouds. Mr. R. Walford gained first and second prizes in the Labyrinth class with Leeris, well-grown and developed. Leeris were third prizewinners for Mr. A. J. Wainwright. Entries in the A.O.S. Trop. Fish class were good. First were Mrs. E. A. Allen's *Pelmatochromis kiribensis* (they shared the Blair Perpetual Trophy) of superb colouring and condition. Another first-class entry was that of *Apistogramma ramirezi* by Mr. F. Stevens. These fish gained second prize and had beautiful colour and even development.

Furnished Aquaria

Over thirty tanks faced the judges in the Tropical Club class. First prizewinner was Stoke Newington A.S. (79 points). The tank relied on well arranged quality plants for its effect with an excellent group of *Cabomba* as the focal point. Tiger and Schuberti Barbs formed a lovely contrast. Clever use of pre-fabricated red rock for the back and sides gave an original appearance to Spelthorne A.S. second prize-winning tank (76 points). Tiger and Rosy Barbs did not contrast too well. The grey upright rockwork of the third prizewinning Hendon A.S. entry (75 points) made a slightly artificial effect although fine-leaved plants gave impression of depth for the Neon Tetras.

(Continued next column.)

Archer Fish Best Exhibit at Rochdale

FOURTH annual show of ROCHDALE A.S. was held on May 20-22 when more than 3,000 people attended. Entries in excess of 340 were received from all parts of the country. One exhibitor brought an unusual *Botia* species from Surrey. An entry sent by rail from Worcester took thirty hours to make the journey; this worried the organisers of the show, but it arrived eventually in a plastics bag none the worse for its trip.

The judges officiating were Mr. Legge (Blackpool Tower Aquarium), Mr. Baldry (Accrington) Mr. Loder (Burnley) and Mr. Chapman (Sheffield).

The best fish in the show was an Archer Fish (83 points), owned by Mrs. I. M. Fletcher, who received a WATER LIFE Diploma. Mrs. Fletcher also exhibited a Tiger Scat which came second in the same class. A member of the Rochdale Society, Mrs. Fletcher is one of the most successful exhibitors in the North. Her daughter, Miss Susan Fletcher, eight years old, won the coldwater class with a Goldfish, the largest fish on view.

Another Rochdale member, Mr. C. A. Blake, who has many wins to his credit, took three cups, five first prizes, four specials, one second and one third at this event. Mr. Blake also had on show a Gourami which had yet to be identified. A second WATER LIFE Diploma was won by Mr. A. Wardle, of Bury; Mr. Wardle had the best furnished tank (79½ points). At the close

it was good to see that the leading club coldwater tanks did not suffer from overplanting. The striking first prizewinner by Willesden A.C. (83 points) made bold use of quality plants. The Scaled Fantails and grey bottom layer added to the effect. Hendon A.S. took second and third places. The second prizewinner (78 points) employed unusual plants and the third (76 points) had more sparse planting with a pleasing bottom layer and a nice Common Goldfish.

Rather bright rock but intelligent design in a small tank were the characteristics of Mr. A. F. Baldock's first prizewinning aquarium (79 points) in the Individ. Trop. Class. Mrs. F. A. Barry made good use of contrasting plants to set off Glowlights and Neons in her second prizewinner (78 points). Clever use of sandstone for the bottom of the third prizewinning tank (69 points, Mr. E. G. Harris) was marred by unnatural background.

Winner of the Individ. Coldw. class, Mr. J. H. Franklin, also won the "Irene" Perpetual Challenge Cup for best individual furnished aquarium. The exhibit gained 82 points and a most pleasing arrangement had been achieved in the compass of a small aquarium. There was plenty of colour diversity in the plants but straggly Hairgrass rather detracted. The occupant was a Moor. Second came Mrs. F. A. Barry (72 points) with a somewhat overplanted tank although the plants themselves were of good quality. The bottom layer was well done. Third prizewinner was Mr. H. Batey (71 points) who used a rock background.

Inter-Society Shield

This year the shield for the society winning most points over the show went to Hendon A.S. (38 points). This was no runaway win. London Transport (C.R.S.) gained 30 points. Stoke Newington 27, Mitcham 26, Willesden 22, Friends 21, South London 21 and Bethnal Green 20.



Photograph

J. L. Anderton

Midnight at Rochdale prior to the opening of the society's show. Some furnished aquaria exhibitors did not complete their entries till six hours later.

of the show on Sunday evening, Mr. G. T. Iles presented the prizes.

SIXTY-FOUR fish entries and 12 furnished aquaria were put in the five-class annual show of DUNSTABLE A.S., held on June 25. Mrs. G. Franklin won the W. J. Holdstock Cup with her coldwater furnished aquarium and Mr. P. Brown took the WATER LIFE Diploma for the best fish in show, with Merry Widows. A. L. Chattell Shield, for the exhibitor gaining most points in the show, went to Mr. M. Green. Two F.B.A.S. judges, Messrs. W. Dacre and J. H. Gloyd, officiated. Mr. Gloyd presented the prizes at the June 28 meeting of the society.

FROM May 23-28 BLACKPOOL AND FYLDE A.S. staged its fifth annual open show. Tower Trophy and WATER LIFE Diploma for best fish in show went to Mr. J. Peck with his *Corydoras melanistius* (84 points). Blackpool Corporation Trophy and another WATER LIFE Diploma were awarded to Mr. N. Hadley, who showed the best furnished aquarium (a tropical exhibit, 78 points). The promoting society gained first prize in the Club Tropical Furnished Aquaria class, whilst Mr. C. Newton took first prize in the Individual Coldwater Furnished Aquaria competition.

News from the North-west

Is Falling Interest in Clubs Due to Television?

Crewe Has Many Fishkeepers But Few Support the Local Society

By "Aquaticus"

IS television the reason for the falling off in attendance at some society meetings, which even threatens the continuity of a few of these bodies? It may be true that the average person, seeing a tank of fish for the first time, looks upon it merely as an interlude in television. But there may be other causes. I mentioned recently the difficulties facing the Bolton society and even harder times have fallen upon the Crewe Aquarist Society in South Cheshire.

This society, about four years old, reached a membership of 50 in two years; yet only eight or nine attended the last A.G.M. in January and Mr. G. H. Thorley was telling me when I called upon him in Crewe recently, that unless there is an increase in support the club may not even be able to meet again. Nevertheless, it is hoped to try once more this Autumn. It is certainly not from any lack of interest in the hobby for we calculated at least 80 owners of tropical fish tanks in Crewe. Mr. Thorley, who is in the trade, puts the blame on television, plus overtime. Most men in Crewe are employed in the motor and refrigerator industries, or in the railways, and have been working overtime regularly, which leaves them too tired for evening activities outside their homes.

Popular Interclub Meetings

The Crewe society used to meet at the Mason's Arms, where it held table shows, discussions and lectures. Its most popular event was an inter-club meeting with the Chester A.S. Attendances were poor for visiting lecturers. Table shows and discussions were popular and the members held an exhibition or two in the foyer of a local cinema. Last year it gave a 30x15 in. tank of tropicals to the Crewe Memorial Hospital children's ward, and still maintains it. The grammar schools do not seem to show as much interest in the hobby as the modern and primary schools. West Street County Modern School and the new Moor Green Primary school have six coldwater tanks each; Mill Street School has a few coldwater and tropical tanks and

Wistaston Green School, near Crewe, has a couple of tanks of tropicals.

The few aquarists remaining loyal to the Crewe society are keen enough, and one of the best fishhouses, with 30 or 40 tanks, mainly tropical, is kept by Mr. R. Perry, at his home at 563a West Street. Mr. G. Newall, the treasurer, is a company secretary. Mr. Gordon Leeke, the secretary, lives in Minshull New Road and is in the refrigerator business. When the society was flourishing the other year, its members were mostly interested in tropical species. Only a few responded to Mr. Thorley's efforts to arouse interest in microscopy and in the pond life of the area.

Crewe is an industrial centre, known to outsiders as a railway junction, but some very pleasant country lies close by. Bowness Pit, at Coppenthal, provided local pond sources of *Daphnia*, and interesting collecting ponds have been worked at Shavington and Willaston. Nine miles away at the marshy Wybunbury Peat Moss, there are lizards, Grass-snakes and interesting bog plants like Sundew, Marsh Andromeda, heath Marsh Orchids and Bog Bean. Slowworms live in a sandbank four miles away at Weston. Crewe Hall Park has a very fine private lake, with its heronry.

Aquarists who are interested in the migrations and spawning habits of native salmon should find the spawning beds as full of fish this Autumn as they were last, for, with the wet Summer, rivers have so often been in spate that many salmon have been urged up-river and the Severn, the Dee and the Cumberland Derwent, for instance, have had exceptionally good Spring runs of fish. Spawning begins in November and, on the Dee last year, 176 beds were counted in the Hiramant Brook, Llandrillo Brook, and 80 in 1½ miles between the Alwen Junction Pool and the salmon-study observatory at Pont Barcar. Watchers will find vantage points on Corwen Bridge and the high bank of Llandderfel. The main spawning grounds are in the tributaries, Ceiriog, Alwen and Trewern. On the Ribble,

Frances Perry Addresses Royal Horticultural Society

DISTINGUISHED lecturer at the Royal Horticultural Society's June 28 meeting was Mrs. Frances Perry, F.L.S., authoress of several volumes and numerous articles on aquatic and semi-aquatic plants. She spoke on "Bog and Moisture-loving Plants."

Mrs. Perry drew comparison between wild peaty bogs with their specialist flora and the East Anglian marshes more in keeping with the conditions obtaining in the garden marsh area—whether naturally soggy or artificially created, either at a pool margin or in a specially-constructed concrete trough.

Here, she said, was a labour-saving and distinctive form of gardening, many of the more troublesome weeds shunning the marsh area, particularly where a few vigorous subjects made their influence felt.

Some plants which progressed favourably, but generally unspectacularly, in the herbaceous border responded in a remarkable fashion when given the continuous moisture of a marsh situation. Whilst many disliked to have their feet in the water they revelled in the luxury of drought-free conditions on the marsh edge and showed their appreciation by throwing up flower spikes of exceptional quality. In this category she put *Labellia cardinalis*, many *Primulas*, including the distinctive *P. denticulata*, all of which she thought looked better when colonised, and *Iris sibirica*.

Another interesting group was the *Mimulus*, particularly the Hose-in-hose form where one flower grew from within another. Their tumbling habit made them useful for concealing the concrete edge of a pond.

Day Lilies (*Heimerocallis*) were now acknowledged as flowers of distinction and with the work done on them to produce brilliantly and variously

coloured varieties the present-day strains deserved a place in the marsh. They did not mind having their roots actually running into the water and the bold foliage, apart from the showy blooms, could be an admired feature.

The speaker put in a word for insectivorous plants, which seem to have largely faded from the horticultural scene in post-war years. Her experiences with the Venus Fly Trap (not hardy except in very favoured circumstances) included noticing that sometimes the leaves, after catching a fly, literally "dribbled" their enzymic juices which digested the ill-fated creature. Either had the effect of "putting the plant to sleep" and it would not react to any flies alighting on it until it recovered.

Mrs. Perry illustrated her talk, which was appreciatively received by her specialist audience, with some very fine slides, many of them in colour.

Canadian Society's Enterprise

PLANS are going ahead for the first public aquarium in Canada, referred to in our April issue. Organising body is the Canadian Aquaria Society and the project will be located in Toronto. Full support has been received from the Ontario Department of Lands and Forests (Fish and Wild Life Division).

President of the Canadian A.S., Mr. W. L. Whitern, informs us that members are now busy preparing their fish for the fourth annual show held as part of the Canadian National Exhibition. Some 43,000 people paid for admission to the society's section last year.

Paythorne Bridge is a favourite vantage point late in November. In the Conway system, there is a riverside path up the Lledr valley, above Bettws-y-Coed. Here, in the Summer drought, I have shown parties the grise resting in the deep rocky salmon-pools where climbing ladders and fishing platforms make them appear very impressive. At other times the leaping of the fish can be easily studied.

In Preston, the other month, I visited the veteran Lancashire naturalist Mr. J. R. Charnley, at his Penwortham home, and saw many interesting things in his possession, including a nice collection of freshwater shells. Mr. Charnley is one of the old school of deeply experienced field-naturalists, with a broad and intimate knowledge of water life. In the past he has often sailed in the original *Lanes. & Western Sea Fisheries* patrol vessel, "James Fletcher," with Dr. J. Travers Jenkins, author of "British Fishes," a standard handbook. Apart from feeling less agile on his legs, Mr. Charnley is still active in natural history. Since retiring from the superintendency of the fisheries at Preston after the war, Dr. Jenkins has been living in retirement near New Quay, in Wales. Mr. Charnley was expecting another visit from him.

Liverpool Schools' Nature Study Group recently staged an aquaria and pond-life exhibition at Salisbury Street Schools. Its secretary, Mr. Thornley, complained to me that he was disappointed in the lack of support from local aquarists' bodies. His members were chiefly primary and secondary-modern teachers, and the graduated biology staff of the grammar schools were equally remiss. Aquarists are a strong line in this group, which has been going for a year now, and has some forty-odd members, but has not yet started charging a subscription!

Two-year-old Society

With the help of a friend who has now left the town, Mr. D. Ince, of Knowles Street, formed the Chorley and District Aquarist and Cactus Society two years ago, in this east Lancashire cotton town on the edge of the moors. There, on a recent visit, I was pleased to find a strong interest in the club and the hobby. Most of the dozen members enrolled at the first meeting are still with the society, but the society really broke the ice when Mr. Ince and his friend exhibited furnished aquaria at the Chorley Chrysanthemum Society show.

For their first year, the society met in a local public house; now it has the Overlookers' Rooms in Cunliffe Street, where membership has doubled. As Mr. Ince points out, "we are a really happy club if not a large one." Here you will find them, on the last Monday evening of each month, textile and ordnance factory workers, builders, a university student, a grocer and even a young lady typist. The secretary and Mr. R. Hartley, the treasurer, are painters and decorators by trade, and the President, Mr. Ainsworth, is a well-known publisher and cacti enthusiast.

Mr. Ince specialises in livebearers, such as Black Mollies, and has had considerable success with them, "without salt and extra high temperatures" as he puts it. He came third in the Mollie class at the last B.A.F. show in Manchester and showed the best Characin at this year's Rochdale Show. As might be expected with a young society, livebearers are the chief fish kept by members. Several have bred various labyrinths and Mr. Ince has bred all the popular ones, favouring especially the Dwarf Gourami. In addition he has had success with Nigger and Tiger Barbs, Egyptian Mouthbreeders and *Polycentrus schomburgkii*. He now intends to try Dwarf Cichlids.

The society recently gave a furnished aquarium to Chorley Occupational Centre for Backward Children, and future plans include an outing and more table shows. In a small town, the combination of fishkeeping with another hobby of similar appeal, such as cacti growing, is an admirable idea as sufficient people are then linked together to form a society. Enthusiasts in other small towns might try linking aquaria-keeping with cage-bird interests (this has been done in a few cases already), or with angling, pet-keeping generally, nature study or anything which caters for people of roughly the same standard of knowledge and outlook. If such societies become very large the sections tend to separate off, as I mentioned recently in connection with Preston Scientific Society and its former aquarium section.

Club Notes and News

The Editor invites clubs to send brief reports of meetings and announcements of forthcoming events. News items for the next issue should reach this office no later than Monday, September 12.

WATER LIFE diploma winners at the **Southampton A.S.** June 23 exhibition were Messrs. A. R. Blandford (Leeri Gouramies) and H. Gilbert (Sun Bass).

MONTHLY table shows are now a regular feature of the **Tyneside A. & B.S.** meetings. Members give ten-minute talks on their exhibits. There has been a varied selection of lectures at recent meetings.

THE Corby A.S. is hoping to get good support from neighbouring societies for its first annual open show on October 28-29. There are 20 classes, including one for club tropical furnished aquaria and two for individual furnished aquaria. Two **WATER LIFE** diplomas will be competed for.

AT the June meeting of **Plymouth A. & P.S.** two films were shown and there was a quiz with members of the Torquay society. Plymouth were the winners by the narrow margin of 11 points. Dr. F. N. Ghadially spoke at the July 9 fixture.

"**BREEDING** Coldwater Fish" will be the title of a lecture to be given by Mr. North (Leeds society) at the August 4 meeting of **Halifax A.S.** On September 1 Mr. T. Hodgson speaks on "Unusual Breeding Experiences."

A **COMPREHENSIVE** programme has been enjoyed by **Kettering A.S.** It included a visit to Corby A.S. on June 8 for a quiz, a visit from Mr. R. O. B. List on June 14, the annual outing to London Zoo on June 26 and a lecture from Mr. G. F. Hervey on July 13.

MR. M. J. HARTNUP, show secretary of **Hendon A.S.**, promises an unusual design for the society's seventh annual open show, held in conjunction with Hendon Show from August 16 to 13. The style will be contemporary with extensive use of large fish photographs. Seven classes are scheduled, four for furnished aquaria and three for breeders' entries. Venue is the Hendon Park, Hendon Central, London, N.W.4, one minute from Hendon Central tube station.

FOR the highest number of points gained at the **Smethwick A.S.** shows Mr. R. V. Noble has received the E. Glasgow Cup and a **WATER LIFE** diploma. Master D. Stokes had the highest number of points in the cold-water classes and for the second year running he gets the Harry Cope Shield and a diploma.

THE Aquarist Society within the **Standard Kolster Social & Athletic Club (Sidcup, Kent)** had two **WATER LIFE** diplomas up for competition in its show on July 16.

MR. D. PULLON of the Nottingham society will judge the **Leicester A.S.** annual show to be held in the St. Mark's Schoolroom, Belgrave Road, Leicester, from August 31 to September 3.

AS part of the Arts and Crafts Exhibition staged at Ealing Town Hall from July 13 to 24 the **Greenford A.S.** put on a display of tropical and coldwater fishes.

SIXTH exhibition of the **Aylesbury A.S.** ran from July 14 to 16 in Hazell's Hall, Aylesbury. The exhibits included tropical and coldwater fish, aquatic plants, marine life, amphibians and cacti.

THERE will be an interclub furnished aquaria competition at the annual show of **Lambeth A.S.** to be staged at St. Luke's Hall, W. Norwood, on September 17. Details can be obtained from the show secretary, Mr. W. L. Niblock, 78 Thornlaw Road, London, S.E.27. The South London Section of the Guppy Federation is also putting on a display at this event. The Lambeth society's programme for the next six months is available from Mr. D. W. G. Page, 18 Clive Road, London, S.E.21.

FIRST open show of **Kirkcaldy A.S.** will be held in the Boys' Brigade Hall, Victoria Street, Kirkcaldy, on August 19-20. Judges

New Secretaries

Kingston A.S.—Mr. L. R. Hedges, 96 Norbiton Hall, Kingston-on-Thames, Surrey.

Basingstoke A.S.—Mr. M. G. Weller, 25 Cliddesden Road, Basingstoke, Hants.

Southport Aquarist Society—Miss K. Lessiter, 7 Carlisle Road, Birkdale, Southport, Lancs.

Merseyside A.S.—Mr. V. C. Walker, 46 Cambridge Avenue, Gt. Crosby, Liverpool, 23.

are Mr. J. Beveridge and Mr. G. Henderson. There are 20 classes, including four for furnished aquaria.

ANNUAL show tank competition of **Southern A.A. (Brighton)** takes place in September. A fish breeding competition is now in progress. Speaker on September 5 will be Mr. McInerney, who takes "Breeding Methods" as his subject.

FORTHCOMING activities of **Riverside A.S. (Hammer-smith)** include table shows for Fighters, Characins and Guppies, a discussion group and a selling class show.

European Judges Officiate in Pakistan

A **GALAXY** of trophies was competed for at the second All-Pakistan Championship Aquarium Exhibition staged in Karachi by the Pakistan A.S. during the Spring of this year. Over 625 exhibits, consisting of furnished aquaria, pairs of fish, plants, accessories and collections of livebearers, egg-layers, Labyrinths and rare species, were judged by Mr. Hans Schmidt, who flew from Frankfurt, in Germany, for the show, and Mr. H. B. Thomsen, M.Sc. (Tech.) of Denmark.

Foreign countries participating included our own Federation of British Aquatic Societies (in co-operation with the Guppy Federation, Hendon A.S., and the London Aquarium at South Bank), the Taronga Park Trust, Sydney, New South Wales, which sent 25 Australian Rainbow Fish, and the China Cultural Association, which gained the cup for best fishes.

The cups and two **WATER LIFE** Diplomas were presented to the winners by the Prime Minister of Pakistan, Hon. Mohammed Ali, and included the Championship Gold Cup (won by Mr. H. A. Warris), 11 Gold and Silver Challenge Cups and 63 other trophies. Mr. H. A. Warris also received one of the **WATER LIFE** Diplomas and the other went to Mr. Agha M. Jaffri, for the best aquarium cabinet.

The Pakistan A.S. secretary informs us that the event showed an improvement on the club's previous show held in 1953.

TWENTY furnished aquaria of tropical and coldwater fish were set up by **Hampstead A.S.** at the Brentwood School, Brentwood, Essex, for the school's annual garden party on June 18. Mr. P. Meyer also installed a furnished tropical aquarium for the biology students at the school. Mrs. W. M. Meadows judged an interclub table show with North London A.S. on June 21.

A **WELSH** Aquarists' Show, run by the **Welsh National A.S.**, will be staged from August 18-20. This year it is a three-day event open to West of England fanciers as well as those residing in Wales. Two **WATER LIFE** diplomas are among the list of prizes.

MEETINGS of **Newcastle-on-Tyne A.S.** are now held at the Liberal Club, 98 Pilgrim Street, Newcastle-on-Tyne 1, on the second Wednesday of the month.

A **SECOND** aquarium and stand has been presented to the Royal Infirmary, Leicester, by the **East Midlands Section of the Guppy Federation**. Latest recruit to the section is Mr. Harry Secombe, the television star. Members have presented him with some Doubleswords and Coferails. East Midlands is to arrange the autumn assembly of the Guppy Federation, which will no doubt be held in October.

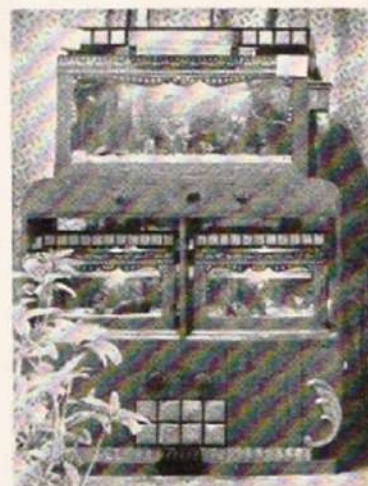
IN an interclub table show between **Llantwit Major A.S.** and **Welsh National A.S.**, 30 fish were on show and Llantwit Major were adjudged the winners by Mr. R. Forest-Jones, B.Sc.

ANNUAL interclub show of **Colindale A.S.** will be held on September 3. **WATER LIFE** diplomas will be awarded to the winning society and for the best fish on show. Seven clubs are competing with 105 fish.

BEST furnished aquarium at the sixth annual show of **Accrington A.S.** (to be staged in Accrington Town Hall from October 27 to 30) will receive a **WATER LIFE** diploma.

MEMBERS of **Peterborough A.S.** visited the London Zoo on June 12. Their third annual show takes place at St. Paul's Church Hall, New England, from September 15-17.

(Continued next page.)



Best aquarium cabinet at the Pakistan A.S. show. It won a **WATER LIFE** Diploma for Mr. Agha M. Jaffri. Mr. H. A. Warris took a similar award.

Club Notes and News—contd.

MEMBERS of Guildford A.C. visited the Haslemere Educational Museum on July 24. A week earlier there was an excursion to McLynn's Aquarium, Ewhurst. At the invitation of a local cinema manager the society is staging an exhibition in the foyer from August 8-20.

PRESENT officers of Dunstable A.S. are chairman, Mr. D. Pettit; secretary, Mr. B. C. Flatman, 54 Gt. Northern Road, Dunstable, Beds. and treasurer, Mrs. G. Franklin. Mr. J. H. Gloyd spoke on "Artistic Aquaria" at the June 28 meeting.

SCHEDULES for the first annual show of N. Staffs. A.S. can be had from Mr. L. J. Perks, 6 Radford Road, Cliffe Vale, Stoke-on-Trent. The event will be staged from September 1-3 in the Charles Street Schools, Hanley.

THE large-scale open show of Midland A. & P.S. will take place in Bingley Hall, Birmingham, from August 25 to 27.

A WATER LIFE diploma will be awarded at the annual show of Nuneaton A.S. to be held on August 1.

MR. S. ROSSER, 16 Dunraven Street, Treherbert, Rhondda, S. Wales, was re-elected secretary of Rhondda A.S. at the society's A.G.M. Mr. D. Copeland was appointed chairman. Schedules for the first annual open show in the Boys' Club, Treorchy, on September 23-24, can be obtained from Mr. Rosser.

ANNUAL show of Urmston A.S. will be held in conjunction with the Urmston Exhibition on August 1. A WATER LIFE diploma will be awarded in the furnished aquaria section.

FOLLOWING the general challenge for an interclub show issued by the Hendon society, Catford A.R. & P.S. received a visit and won by 37 points to Hendon's 33. Judges were Messrs. Hewitt, Searle and Holloway and Mrs. B. Robertshaw gave a lecture on "Breeding Characins" while judging was in progress.

AT the first meeting of Kidderminster A.S. Mr. V. Hillman gave a short talk on the "pH of Water." Mr. R. Dudley spoke at the second gathering. Secretary of the society is Mrs. V. M. Hillman, Brockencote House, Chaddesley Corbett, Worcs.

THE Ulster A.S. (Belfast) staged a small show on June 3 and 4 in aid of the Forces' Help Society.

A MANCHESTER school which has recently formed an aquarist club is the Stretford Grammar, Great Stone Road, Stretford.

Autumn Events

AMONG important open shows to be held in the Autumn is that of Bristol A.S., a two-day event on September 30 and October 1 in the Central Y.M.C.A. Concert Hall, Colston Street (Trenchard Street entrance). Judging the tropical exhibits is Mr. C. D. Roe and the Bristol A.S. panel will officiate in the coldwater section. It consists of Messrs. E. R. Blunsden, R. V. Combs, S. J. Davis, N. O. Grimston, V. E. Jones, D. S. Paul, A. W. Rudge and H. C. B. Thomas. Mr. A. J. Elliott will place the reptiles and amphibians. There are 33 classes and many special awards. Show secretary is Mr. V. E. Capaldi, 18 Glen Park, St. George, Bristol 3, from whom entry forms can be obtained. Closing date for receipt of entries is September 12.

THREE Counties Aquaria Show, arranged by the Reading, High Wycombe and Oxford societies, will be staged in the Palmer Hall,

AS part of a commercial exhibit at the Royal Show, Nottingham A.S. set up a 9 ft.-long aquarium containing local river fish. On June 29 there was an extraordinary general meeting to discuss a proposed amendment to rules and Mr. E. H. Riddle (F.B.A.S. chairman) spoke on "Furnished Aquaria" and "Tropical Fish Breeding." Mr. R. J. Affleck, M.Sc., was the visiting speaker for July and his subject was "Inheritance in Goldfish and Guppies." The society's annual show takes place in the Palais de Danse, Nottingham, from August 31 to September 10. Judging of the individual fish by Mr. W. L. Mandeville will be done eight days previously.

OVER 100 aquarists attended the Chelsea A.S. headquarters recently for a film show. The main feature was "Under the Red Sea." The children of Chelsea are being invited to set up furnished aquaria and show coldwater fish at a joint exhibition with Chelsea Cage Birds Society on August 5 and 6. Over 100 tanks will be provided.

FROM July 4 to 23 the Winchester City Aquarists held their annual exhibition.

MEMBERS of Chester A.S. have recently installed and stocked a tank at the local Upton School. The annual open show was staged from July 7 to 10 with 24 classes divided into five sections. Judges were Messrs. A. McDowell and K. R. Owen.

THE Chingford A.A. heard Mr. L. J. Flowerdew speak on London's water supply at a recent meeting of their club.

FROM September 8 to 10 the Coventry P. & A.S. will stage its annual show in Queen's Road Baptist Church Hall. Speaker at the July 13 meeting was Mr. R. Marshall, of Walsall. Members are planning to go on two outings shortly, one to Shirley Aquatics and the other to the British Aquarists' Festival at Manchester.

ANOTHER society to put on a display at a local cinema in connection with a film of aquatic life is the Basingstoke A.S.

MEETINGS of Penistone A.S. are now held on the third Wednesday of each month, instead of the third Tuesday.

AT the Willesden A.C. annual dinner Mr. W. S. L. Mellish received a presentation in acknowledgment of his five years' service as chairman of the club. A party of members has visited Basingstoke to take part in an interclub show with the local society. Willesden were the winners with 18 points to Basingstoke's 10 and they also took the prize for best fish in show, which was a female Red Swordtail shown by Mr. S. Atkins. The Willesden club show will be held in Roundwood Park on September 10-11.

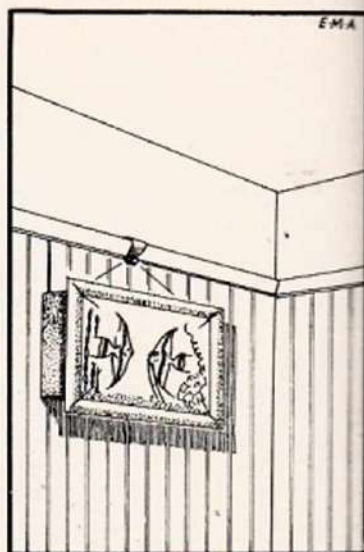
MEMBERS of the Invicta F.C. (Gillingham, Kent) recently paid a visit to the fishroom of Mr. J. E. Edwards (Surbiton).

West Street, Reading, from October 13-15. Show secretary is Mr. F. H. Crane, 26 Kensington Road, Reading, and entries should be sent to him no later than August 20.

YOUR DIARY

Will not be complete until you have put down details of the next WATER LIFE Show. It will again form part of the National Exhibition of Cage Birds and Aquaria. The dates are January 12, 13 and 14, 1956, and the place, the National Hall, Olympia, London, W.14.

Plans are now being made for another display in which furnished aquaria will play a prominent part. The committee has already met to make preliminary arrangements. Particulars will be given in the next issue. Why not decide now to make an entry and to pay the show a visit?



"KEEP STILL, STUPID—THIS IS SUPPOSED TO BE A PICTURE."

Post-war Trend in Chelsea Show Gardens

SHORTAGE of labour to manage large gardens has brought about a gradual transition in the gardens' section at post-war Chelsea Shows. Ornate designs, needing a considerable amount of time for their upkeep, have become progressively fewer and simplicity has tended to be a principal factor. This year the trend seemed even more in evidence, with several firms which had adhered to the old traditions not exhibiting and a number of new ones entering the competition and acknowledging the modern approach.

As in previous years, a high proportion of the outdoor garden layouts included aquatic motifs, ranging from the contemporary formality of Messrs. R. Wallace & Company's garden (photograph on page 171) to the beautifully blended rock arrangement of Mr. George G. Whitelegg, shown on the front cover. Incidentally, both gained Gold medals.

Rock Arrangements

Newcomers to the informal gardens were Messrs. H. Savory & Co. Ltd., where flowering rock plants gave a colourful setting for the tumbling water. Messrs. Atkinson & Co. made effective use of dwarf conifers in the rock bank behind their main pool and no doubt made many pond enthusiasts realise the potentialities of this unique group of evergreens. Water flowed from beneath a bridge and followed a meandering course to the main pool in the formal garden of Messrs. R. Hancock & Son (p. 170). With summer house in sympathy and wide expanses of lawn, the garden won a Gold medal. Another exhibitor to gain this premier award was Messrs. Winkfield Manor Nurseries; a small formal pool was set in the foreground here with an interesting lawn and herbaceous stretch behind. Mr. Percy S. Cane (his garden is shown on page 171), well known for his use of white stone for small formal pools, garden furniture and summer houses set in lawns and flowering shrubs, produced an exhibit well up to his usual standard. On different lines was the pool in the garden of Messrs. Cheal and Sons (p. 170). It followed the lower lines of a terrace on which was a summer house.

The Women's Voluntary Services displayed a suggested garden for the housing estate or new town dwelling. In it was a pool of simple contour—a useful reminder that, even for the small garden, water and aquatic plants can provide an element not easily replaced by other features.

A.S.L.A.S. Now Well Established

Efforts of Thirty-five Clubs Co-ordinated in the Area Group

By S. Davies, Hon. Secretary

THE natural reaction to five years of war followed by two or three years of restrictions, was to seek an outlet. Many people found it through the installation of tropical and cold-water tanks in their homes. A large percentage of these newcomers to our hobby, who formed a complete cross-section of the community, accepted Nature's challenge to breed and keep their fishes under the best possible conditions. Where, they asked, could they obtain the necessary information? By joining a club and reading the hobby's periodicals.

As a result of this thirst for knowledge, many clubs sprang up, especially in and around the London area. Most of the committee members were new to the hobby and, though there is no doubt they carried out their duties with zeal and enthusiasm, they needed the guidance of the expert. Few were in a position to give advice to the novice.

Varying Finances

The financially strong clubs up and down the country could obtain the services of speakers. But what of the new clubs, usually built round one or two experienced aquarists with a host of novices and bank balances next to nothing? How did they obtain their speakers? Many would not afford to join a national federation, so that experienced members had to be prepared to talk on any subject.

This was the position in 1949. A thriving hobby had a national organisation competent to consider and recommend matters of principle and policy but apparently not able to meet the need for a different type of organisation closer to the every-day problems and details of small yet energetic clubs.

Association Mooted

The committee of the Study Club debated the problem for a while, and, realising that many struggling clubs could become thriving only if encouraged to help one another, decided to approach other clubs in South London with a view to forming a local association pledged to develop this area. In December, 1949, seven clubs met at Sutton and from their friendly co-operation the Association of South London Aquarists' Societies (A.S.L.A.S.) was formed. Their first show, in 1950, held under the sponsorship of Messrs. Bentalls Ltd., of Kingston-on-Thames, and arranged by the member clubs (then numbering nine) gave ample proof of their fishkeeping ability.

Since then A.S.L.A.S. has grown into an influential body representing clubs from Erith to Thames Ditton and south from the river to Redhill and Horley, all with the single aim laid down in the Constitution of 1949: "To promote and foster the progress of South London Aquarist Societies." The annual shows held at Sutton,

Surrey, each year are widely acclaimed as the finest shows south of the river, which achievement bears further testimony to the strides taken since 1949.

Promoting shows is not the only aim. There is now available to all clubs in the area a panel of qualified lecturers who can deal with all branches of the hobby in stages ranging from elementary advice for novices to highly technical studies in water chemistry, microbiology and genetics. A satisfactory card system for booking lectures and judges was developed and has been in use over the past three years. Since all services are given free, the cost is trifling and well within the means of the smaller club.

For the benefit of associated clubs, A.S.L.A.S. has a group of judges, specially trained and tested both in theory and in the practical recognition of the best in all species of fish and plants. In one important aspect A.S.L.A.S. is different from other Associations. All fish in the tropical section of A.S.L.A.S. shows are exhibited in pairs, with the sole exception of Guppies.

Since 1949, apart from creating and enlarging its Lecturers' and Judges' Panels, A.S.L.A.S. has organised independent tropical and coldwater judges' courses, a series of central lectures by knowledgeable aquarists, its annual show and an inter-club table show competition. As an alternative to a lecture there is a brains trust panel or a quiz programme. A.S.L.A.S. also has the use of a projector and films, with the services of a projectionist.

Should a club decide to hold a show then this Association's 350 tanks are at the show secretary's disposal should he so desire at a much reduced rental. A.S.L.A.S. is just over five years old with 35 clubs within its framework.

New Insurance Scheme

A FAVOURABLE insurance scheme for aquarists has been negotiated by the Federation of British Aquatic Societies with the Orion Insurance Co. Ltd. It will be recalled that in 1953 the Federation made an arrangement with another Company but the recently-formulated one is believed to give more scope and coverage.

The proposal form is divided into three sections. One gives normal householders' comprehensive cover on buildings, at 1/6d. per cent on the full value, and contents at 5/- per cent on the full value. A second enables trophies, etc., to be insured against risks with the usual exceptions of loss or damage due to war, riot or civil commotion, wear and tear, depreciation or damage due to any process of repairing, restoring and renovation. Annual premium is 5/- for £10 value, 6/6 for up to £25, 10/- for up to £50 and 15/- for up to £100.

It is the third section which will interest most aquarists as it gives cover for the contents of aquaria, equipment and accessories and water damage. Premium is 5/- per annum for £10 value, 7/6 for £25 value, 10/- for £50, 12/6 for £75 and 15/- for £100. For the contents of aquaria, protection is given for loss caused by fire, lightning, explosion, theft, riots or civil commotion, storms and tempest, flood, burst pipes or impact, breakage or damage to aquaria, or accidental overturning and failure of heating, aerating or thermostatic apparatus. Excluded from claims are wear, tear or depreciation and damage caused in repairing, restoring or renovation.

All loss or damage to proprietary equipment and accessories receive cover except wear, tear or depreciation, damage in repairing, restoring, renovation or due to electric current, short circuiting, overloading, internal breakdown or faulty manipulation.

Cover for water damage to other contents, fittings and fixtures, due to breakage or leakage of any insured aquaria, does not exceed £100 on each occasion and excludes the first £2, 10/0 of every loss.

Minimum premium over the whole insurance is 10/-. A no-claim bonus of 20 per cent will be allowed for every claim-free year.

Proposal forms will be available shortly from the Federation secretary, Mr. R. O. B. List, 1, Coronation Court, 31, Willesden Lane, London, N.W.6.

At the June 11 Assembly, where details of the above insurance scheme were given, Madame A. Dubach of Holland gave an illustrated lecture. Mr. B. Meadows received a warm welcome on

attending for the first time since his severe accident last year. It was announced that the Welsh National A.S. is hoping to incorporate the whole of Wales in an area group. At the time of the Assembly there were 93 affiliated societies and two official area groups.

Two-day London Guppy Show

WITH the considerable interest being shown in the many varieties of Guppies now bred in this country, this year's annual show of the Federation of Guppy Breeders' Societies promises to be of particular interest. As last year, the event will be staged in the Pavilion Cafeteria, London Zoo, but on this occasion it will be of two days' duration—September 24-25. There are 21 classes for members and six open classes, four of the latter for individual fish and two for breeders' exhibits. WATER LIFE Diplomas will be completed for in addition to the usual fine array of trophies. Entries close on September 3 and applications for schedules and entry forms should be addressed to the show secretary, Mr. W. Howe, of 24 Kerfield Crescent, London, S.E.5.

Pengilly Trophy

THIS year the Pengilly Trophy will be competed for at the Bethnal Green A.S. event running from September 9-10 in the Bethnal Green Men's Institute. This coveted prize will go to the best entry in the breeders' classes. Each year the Pengilly Trophy is up for competition at a different event; in 1954 it was the Guppy Federation which had the trophy for its annual show. Winner then was Mr. F. Humpidge, a Cheltenham and Gloucester Section member.

Amphibians on View

TWENTY-ONE species of amphibians were on show at a recent meeting of the British Herpetological Society's London Group. They included the American Bell Toad, *Hyla gratiosa*, *Bufo marinus*, *Triturus pyrogaster*, Hammond's Spadefoot Toad, *Hyla ewingi*, *Pelobates cultripes* and *Xenopus mulleri*. Three outings were arranged by the Group for the Summer season.

Goldfish Society Considers New Standards

THE Goldfish Society of Gt. Britain held its A.G.M. on July 9, when the chairman, Capt. L. C. Betts, M.B.E., reviewed the progress of the past year and expressed satisfaction over the consolidation of the Society's activities. He remarked on the large attendance and said it was indicative of the enthusiasm of the members. The treasurer, Mr. A. W. Sumbler presented an extremely favourable balance sheet whilst the auditors, Messrs. Cluse and Birkenhead, commented on the high quality of the accountancy and drew attention to the value of the society's assets.

The chairman referred to the necessity for bringing the policy of the society up-to-date. He said there were three aspects which called for decisions to be taken. First, the four basic varieties presented nearly eight years ago needed further examination to see if they served present day needs. After a few minor adjustments, these were unanimously accepted by the members present and will be submitted to a final postal ballot of all the members.

Other Characteristics

Secondly, Goldfish with new characteristics were now available. As they show modifications of external features not included in the four basic varieties, it would possibly mean that additional standards should be contemplated. Such fishes included the Bubble-eye, Nasal Septum (Pompon), Celestial and Pearl Scale.

Thirdly, whilst the society could not recognise the Fantail, Common and London Shubunkins, and Oranda, the members might debate whether or not the society should present standards for these varieties as a guide to the hobby.

The discussion that followed on the second and third points divided the meeting into two camps. The President, Mr. R. J. Albeck, M.Sc., said that however much members disliked the new variations, they possessed modifications which they as a specialist society were bound to recognise. The Fantail and Oranda were either intermediate developments or were already catered for in the Bramblehead which meant they could not be recognised.

The Technical Director, Mr. E. G. Weatherley, said the new variants were travesties of fish. If they were to be considered then the intermediate developments should be considered also. The general discussion brought out a number of useful points and the matter was referred back to the committee for further consideration.