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THE **AQUARIST**
AND PONDKEEPER





THE AQUARIST

AND PONDKEEPER

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Coldwater Fishkeeping

THE FANTAIL GOLDFISH

by Arthur Boarder

THE FANTAIL GOLDFISH is one of the finest of the goldfish varieties. It is more handsome than the common goldfish but yet hardy enough to stand our winters in an outdoor pond. As a young fish it is ideal for the indoor tank and a small shoal of youngsters make a very attractive addition to a furnished tank either for exhibition purposes or just as a decoration for the living room. Some of the fancy varieties of goldfish are rather dodgy for an outdoor pond as their flowing finnage is liable to be attacked by fin congestion, fin-rot or fungus.

I live in Middlesex not far from the Bucks. and Herts. border and have kept fantails in my outdoor ponds since 1937. The adult fish are never brought inside for the winter and I have never lost a fish through the cold. For many years the pond was left unheated during the winters but recently I have used a 100 watt heater during very severe weather to keep a small hole open in the ice. Prior to that all that I did was to open a hole in the ice with a water-can filled with boiling water, which stood until a hole was thawed. It is not often necessary to switch on the heater and during last winter the heater was never in the pond at all.

My usual method of breeding these fish is to leave the parent fish in the pond which is not planted up with a quantity of under-water oxygenating plants. I have two or three water lilies and if the water gets too green in the summer I use a quantity of duck weed on the surface to shade out much of the

sunlight. My fish are fed fairly well during the late summer and autumn so that they can obtain plenty of nourishment to build them up for breeding in the spring. By not having weed all over the pond, I am able to place nests of Hornwort in the shallow part of the pond on which the fish can spawn. If I had weed all over the pond, the fish would spawn there and I would be unable to gather the eggs. As it is, once the spawning starts, I can take out a bunch of weed with eggs and replace it with a fresh bunch. This always seems to spur the fish on to fresh efforts.

The eggs are placed in concrete hatching tanks which I constructed and are 24 in. \times 12 in. \times 9 in. outer measurements and have a thickness of half an inch. Heaters are used to keep a minimum temperature of 70°F, but during the hot weather this season the temperature has risen on occasions to 92°F. This does not appear to harm the fry or eggs but I do use some aeration all the time the eggs are hatching and the fry are young. Each year some of the youngsters are brought indoors to a set-up tank in the living room and any of the other youngsters good enough to join the breeders in the pond are put out with them. If a spawning has occurred early in the year I can put the current year's youngsters out in the pond, but if the spawning was late then the young ones are kept in a garden frame for the winter where the temperature never falls below 40°F.

I find that a few young fantails in a furnished tank are most suitable as they never rush around hectically like some tropicals but yet keep active and do not lie on the bottom of the tank like some veiltails and veiltail moors. In the garden pond they are fairly lively all the time and their double tails make them more attractive than common goldfish. I find that my strain change colour from their original bronze to gold in a matter of months. This year many of the fry hatched in May were fully coloured within two months and when they were not more than an inch of body length. There is no doubt that the warm weather has hastened the colour change and it was noticeable that a few of the fry were colouring at six weeks of age.

This early colour change is a great advantage as when one has to wait for a year or more before this happens it means that many fish have to be kept far longer than necessary to make sure if their colour is what is needed. I like my fish to be all red, but occasionally a few have some white or silver markings on them. This is not necessarily a fault but I prefer the fish to be all red. The white may just appear at the end of the caudal fin but I have found that it never changes to red and that the silver may increase in size each year.

Besides being such grand fish for pond or tank fantails can also be very good exhibition fish. They are good fish for showing off in the tank whilst being judged and with their deep bodies and large tail, they look most attractive. Many fantails are being imported into this country nowadays but few I have seen would come up to the standards necessary to win at a good show. The fault appears in the caudal fin which is invariably too long. This is with fantails of not more than an inch and a half body length and if this is the case when so young, it is almost certain that these caudal fins will grow and the fish will have much too long a caudal for show purposes. It is a fact that in most fancy goldfish which have an enlarged caudal fin, this feature tends to grow out of proportion to the rest of the fish as it ages. Many two or three-year-old winning fancy goldfish would have too long a caudal fin, when a little older, to enable them to win at a show.

For the benefit of those aquarists who would like to breed fantails for show purposes I will give the standards required for them. Over the years these standards have changed quite a bit, but the fundamental requirements are the same no matter what organisation makes the pointings. In 1947 the standards for the fantail as required by the Federation of British Aquatic Societies was as follows: The general shape of the body should be ovoid, or resembling a hen's egg, but compressed laterally. The head should be wide and short, length and depth equal. The dorsal fin to be three-quarters

the depth of the body with the outer margin slightly concave. The caudal fin to be divided, in length three-quarters that of the body, united at base for one quarter of its length. This was altered later so that the fin should be completely divided. The fin should be deeply forked so that it formed four lobes. The fin should be carried stiffly in a line with the central line of the body. This is where many fish fail at a show as their caudals are too drooping and not carried out behind the body.

The pelvic fins are equal in length to the body and the pectoral fins three-quarters that length. The anal fin to be completely divided and separate. A scaled and a calico fish were recognised and a rather complicated system of pointings was given for each of the features mentioned together with colour. The colour for the scaled fish was to be a rich, warm red and that of the calico as for the shubunkin. A later set of standards by the same society showed the fantail to have a less deep caudal fin but otherwise rather similar to the earlier standards. The use of the word nacreous was brought in instead of calico. This was to please the Goldfish Society. However, it appears that some aquarists do not yet know what is implied by the term nacreous. For many years a fish coloured like the shubunkin was referred to as calico and this term was well-known throughout the hobby. I have recently seen a schedule for a fairly large aquarists exhibition where there is a class for a nacreous scaled veiltail. Now how can a nacreous or calico fish be scaled? It is a contradiction in terms, and on the same schedule moors were referred to as 'black' moors; again a strange name as if the fish were not black they were not moors.

Later standards by the Goldfish Society show the fantail as a very deep bodied fish with an inadequate caudal fin and with short pectoral and pelvic fins. Different pointings are also given but these can be ignored as in any show where there are a goodly number of exhibits in a class no judge would have the time to point up all the fish in every class. It is usual for a judge to look along the class and pick out a few fish which are worth judging and settle for them. Actually, whatever system of pointing is used, providing the judge knows his fish, the best fish should win. One of the probable causes of a fish failing at a show is that it is not in good condition. In such a case the fish would not show off its best colour and also would get little for department. I have never known a fish to have good department if it was out of condition. The training of a fish for a show is also important and frequent runs in a show tank will get the fish used to such a position and if given a little of its favourite food on such occasions it will tend to keep the fish alert when at the show.

PHOTOGRAPHING FISH

L. E. Perkins

Without a dividing glass these fish are within the same plane only by good fortune. From Agfacolour transparency.



IT IS TRUE to say that many a good photograph has been taken with an inexpensive "automatic" camera—that is an instrument with a fixed focus lens and the minimum of diaphragm settings such as: "sunny," "bright but hazy," and "cloudy". This is not to say, however, that the chances of securing acceptable results with such an instrument are likely to be good when shooting fish in aquaria. Fish photography is a specialised branch of cameraship and its of paramount importance to obtain the best equipment possible and that it shall be especially suited to the job in hand.

Choice of camera

The camera should, ideally, be a single lens reflex type and incorporate a prismatic, through the lens finder. Its lens should have an automatic diaphragm which remains at full aperture until closed to the pre-selected stop by the shutter release mechanism before the shutter operates. A pre-set lens is functional but has serious drawbacks when taking, for example, spawning sequences where speed of action

on the part of the photographer is essential to capture brief incidents.

The size of the camera is a matter of choice which is greatly influenced by the problem of field depth—ever present with close-up photography—which decreases with the increase of lens focal-length and confirms the popularity of 35mm film size in this field of work as in many others. Larger cameras come into their own when large blow-ups are required but the average aquarist is seeking slides for projection purposes and what more could he wish than that his film is returned from processing neatly cut into individual shots, each of which is trapped neatly in a frame ready to slot into his projector?

Lighting

With a plethora of electronic flash units covering a wide price range, a suitable unit should be neither difficult to obtain nor expensive. The prime requisite is that it shall be neither too small or too large in power rating. The temptation to obtain a unit of more power than is required is a strong one but can cause problems when it is found that the camera



In colour this is acceptable because the gold, black and silver contrast with the green of the plants and background. A different story, though, in black and white. From an Agfacolour transparency.

lens will not stop down far enough to permit the flash unit to be mounted on the camera but requires, instead, that it shall be positioned some distance behind the camera.

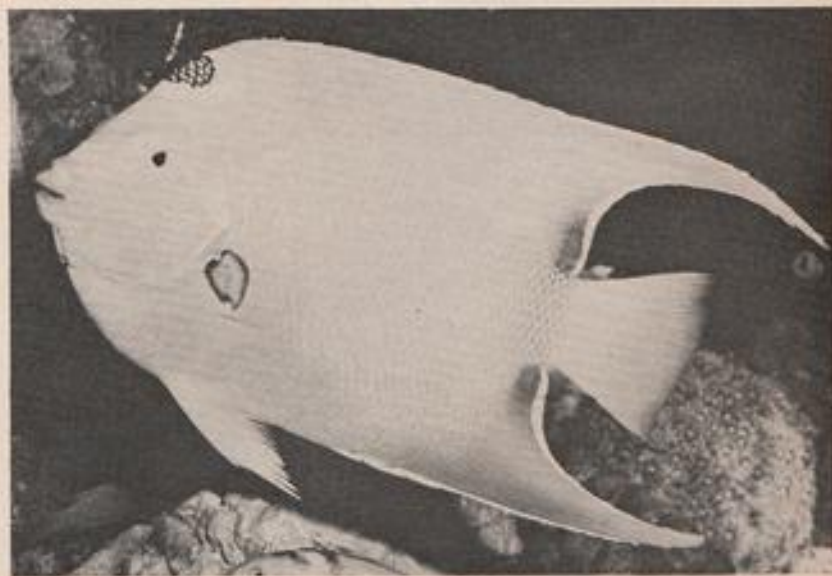
The position of the light source is a matter of some choice although such choice is limited. To employ frontal lighting needs a deal of manouevering to overcome reflections from the aquarium glass so that top or side lighting is often favoured or the use of an additional flash to facilitate top *and* side lighting. To find the most suitable lighting set-up requires experimentation with the making of careful notes

indicating precise distances and f numbers with a view to obtaining a standard procedure or, at least, a working yard-stick.

The aquarium

In the majority of cases the aquarium is principally the home for the fishes and photography merely a means of recording the overall effect. However, in those cases where photography is taking precedence or a particular fish warrants individual treatment, it may be decided to prepare a tank especially for photography. The first essential is simplicity of

Queen Angel. An ideal subject in colour or black and white. A well-behaved sitter, the camera was able to move in for a frame-filler. From an Agfacolour transparency.



Young *Osphrenemus goramy*. A bright reflecting silver in this case requires less exposure.



furnishing so that as little fussy detail is present to detract from the main subject and plants should be limited to a small clump at each side near the back of the tank. For the "backdrop" select a piece of stout art paper of a colour suited to the set-up (pale green, blue or black for example) and either fix it to the exterior of the tank or on the inside of the back glass but in the latter case it is as well to test that dye does not colour (or poison) the water.

If it is possible to introduce a sheet of glass to keep the fish within a front "compartment," the background plants may be placed in the rear section and close to the divider so that their fussy shadows do not fall upon the background. As well as keeping the fish within a pre-determined field of focus, the dividing glass with plants behind denies the fish cover in which to hide from the camera.

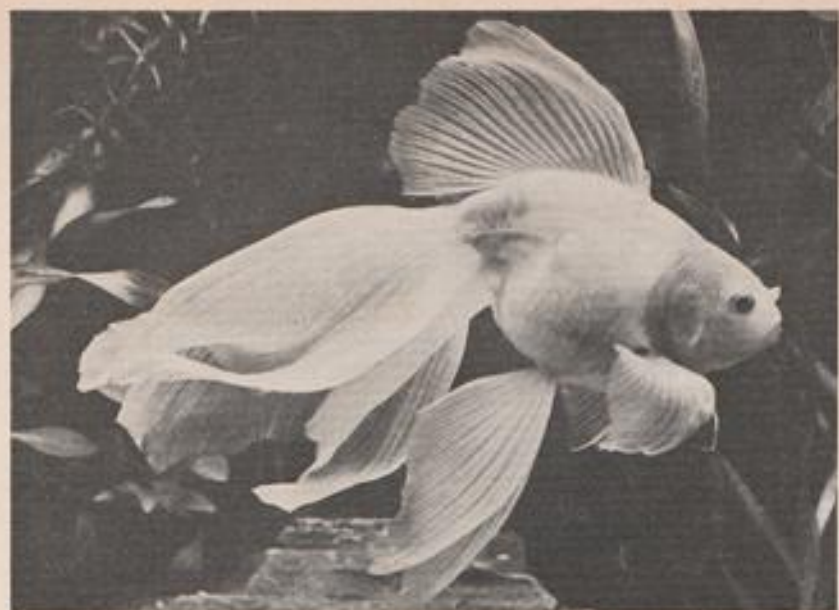
When deciding where to position the dividing glass, arrange for it to be situated the minimum distance from the tank's front glass so that there is just sufficient space between the two to permit the subject fish to turn *without discomfort*. Supposing that a close-up of a two inch long fish is required—say a platy. A supplementary lens to fit the camera lens will be needed and of sufficient magnification to allow the camera to focus down to a foot or less. At this range focusing becomes critical and even if the smallest available stop is used the depth of field (i.e., the band in which detail will remain sharp at a given *f* number) will be of the order of 2 in. or so. To take full advantage of what is available one should avoid focusing on the front glass and instead focus on a pencil or a thermometer held inside the tank but not against the inside of the glass because fishes swimming along the tank's front and close to the

glass will leave room for the movement of their pelvic fins and this allows us to add an inch or more to the depth of field which can be very useful.

Tripod-mounted or hand-held camera?

Under perfect conditions such as in one's own home, it may help to ensure best results to fix the camera on a stand, carefully focusing within an area likely to be traversed by the fish and then arranging the lighting with equal care. Free to carry on with another pursuit in the fish-room, one can keep an eye on the set-up and make an exposure when the fish glides into place.

The alternative method of holding the camera in the hand is often preferable with some fish species, but it is sometimes necessary to avoid chasing the subject when enthusiasm overcomes good sense. The trick is to focus roughly on the fish as it passes a given quarter of the tank, keep the camera so trained and when the subject returns, perfect the focusing by moving in or back and then shoot. This method is ideal with some fish which have well trodden routes along the tank. It is also good for "hangers" like angels and discus. Many of the tetras cannot contain their curiosity and will be attracted by light from a torch or a winking mirror. The aquarist will know his fish and whether to arouse its curiosity, stalk it, creep up on it or prepare a trap in the form of the pre-focused stand-camera. Many fish species have retiring dispositions and are among nature's camera-shy subjects. Botias and the like which favour lurking holes under rocks may be tempted out with offerings of food but while this may work in particular cases the introduction of food can ruin a crystal-clear set-up for some time and such ploys



Veiltail Goldfish.
Flashlighting is not essential. This photograph was taken in 1947 on Ilford FP3 film with an exposure of 1/100th sec. at f11 using two "Photoflood" lamps above the aquarium. Excessive heat generated within the canopy made a "dimmer" circuit necessary.

are best regarded as last resorts. If focusing has been critical enough to do justice to the scales on the fish it will reveal particles of food falling like snow or gyrating daphnia each doing her respective thing all over the tank space.

Difficulties of lighting arise when attempting to photograph a very well furnished set-up. The plant growth may be such that the tank ends are out so far as placing the light source(s) there is concerned or so lush and tall that overhead lighting is also impossible and all that remains is to light from the front. This can be quite a challenge and the easiest way out may be to concentrate only on a portion of the set-up and most likely the central part where an open area can be included to avoid the dense thickets crowding in from each end.

Films

Today's colour films provide excellent truth of rendition when correctly exposed and the choice of manufacture is quite wide. Further choice is afforded by a range of emulsion speeds but these should not be considered as vital factors if high speed flash is employed. If one's flash unit lacks power and to change it is not possible, the use of a faster film emulsion could be the only answer but slow speed film used in conjunction with a more powerful flash unit is much to be preferred.

So far it has been assumed that colour film only is to be used but there are occasions when the aquarist needs a monochrome print and elects to load up with black and white film. Black and white photography of fish presents certain additional difficulties

not the least of which is the flattening of contrast between the varying shades of grey to which colours are converted. This can result for example, in the tip of a leaf peeping up behind a fish looking like a freak fin. More attention to simplicity of planting is needed and backgrounds, too, should be simplified by limiting them to white, grey or black according to the depth of colour exhibited by the fish. Colour filters can help but can often cause confusion. It is often better to have a black and white negative and print made from a good colour transparency from which superior tonal contrast can result. Even with ideal equipment, specially designed aquarium for photography and well-behaved fish, compromise and attention to small details form the basis of success and the secret is to be aware of the limitations imposed by the camera's optics when working at close quarters and the presence of much glass in the aquarium offering reflecting surfaces. An easily overlooked pitfall is the uncleaned or hastily wiped front glass which can often ruin an otherwise excellent shot when fingerprints, smears or algal blemishes are thrown into high relief only in the presence of the flash and discerned only in the end product.

It is always worthwhile to make at least two different exposures of the same subject and more if previous experience has not laid a foundation of reliable confidence. A lot of time and care can be expended on the setting up of a "fish studio" and thrift in the use of film can be ill advised. The best of all advice to be offered, though, is that careful notes of detailed data should be made of each session so that the necessary experimentation is kept to a minimum.

Heterandria formosa

by Jack Hems



IT WAS IN 1853 that J. L. R. Agassiz—one of the greatest ichthyologists of the nineteenth century—first described this livebearer of the family Poeciliidae for science. Yet nearly sixty years passed before it appeared in aquarium tanks in Germany. (Germany was the nursery of the tropical fishkeeping hobby).

The fact that this species is one of the smallest tropicals known adds to its interest and attractiveness. A pair of *H. formosa* and their offspring may be kept in comfort in about a quart of water; for a full grown male attains no more than about $\frac{1}{4}$ in. A well-developed female about $\frac{1}{2}$ in. more.

Apart from the difference in body length a quick glance is all that is needed to distinguish the female from the male. Even as a month-old fish she has much fuller sides. As for the streamlined male, his anal fin (gonopodium or sperm-shooting organ) is remarkable for its rod-like appearance and length; for though it is situated well forward on the ventral surface it terminates at a point roughly in line with the rear margin of the dorsal fin. The anal fin of the female is, of course, fan-shaped.

The colours of the fish are neither sparkling nor garish. All the same, they cannot fail to please the eye. The back is brownish olive shading down to white highlighted with gleaming silver on the belly (markedly so in the female). A number of black vertical bars cross an equally dark horizontal but rather broken stripe that extends from the metallic gold and silvery green gill-covers to the base of the tail. In young fish the vertical bars stand out more clearly than they do in adults. The dorsal and anal fins of the female are adorned with black in their bases. A dab of creamy-ivory or orange-red, more noticeable in some fish than in others, heightens the effect of the black. The male has the same colours in his smaller dorsal fin.

The requirements of this fish in the matter of temperature are not strictly tropical. As a matter of fact, the small container used to house a pair may be stood on any surface (such as the glass cover of a heated tank or a shelf near a radiator) that will maintain a range of temperature in the lower sixties to the mid-seventies (°F). It is, however, asking for trouble to alter the temperature the fish have become

used to too rapidly. Thus the change from the upper seventies (°F.) of dealers' tanks must be brought about gradually.

Courtship and breeding will take place in the middle sixties or lower seventies (°F). As in all other livebearers we know, a pregnant female develops an ever-increasing fullness in her sides and underparts. When she is about to deliver young her abdominal contours look nothing less than bloated. The tiny fry, however, are not produced in large numbers nor all within the space of a few minutes or hours. As a rule, no more than two or three babies are delivered within the space of a day or a week. For all that, delivery of a batch of young may extend over a period of some three or four months. Therefore it is hardly necessary to say that baby *H. formosa* of different sizes are always present in a tank housing a pair of mature fish. Some of the larger fry should be removed to fresh quarters every so often. This as a precaution against overcrowding and bullying. Another thing, as the mother fish is not above making a meal from her newly born offspring a thick growth of plants is called for. The fry are smart enough to keep well away from danger if the tangle of submerged vegetation is spreading enough to mask their presence. Among the plants most suited to a small container are nitella, pygmy bladderworts, Java moss, fine-leaved willow moss and hair grass. A layer of well-soaked peat debris on the bottom is another aid to saving fry.

H. formosa is not out of place in a community tank housing some miniature fishes such as *Rasbora maculata*, the neon tetra, and the like, but it must be understood right away that no, or hardly any, fry will escape being eaten. That is unless the tank is a spacious one and well-planted into the bargain.

H. formosa is easy to feed. In a word, it will accept anything swallowable. Swallowable in this case, however, means minute foods such as tiny white worms, newly hatched gnat larvae, brine shrimps, and powdered dried food. Powdered dried food suits the fry well.

H. formosa—popularly called the mosquito fish, a name also given to several other livebearers such

as species of *Gambusia*—is a very active little creature and the males in particular frequently engage in fights which appear to result in no torn fins or body damage. Between-times they keep themselves busy seeking out and chasing the opposite sex.

In the natural state *H. formosa* ranges from North Carolina to Florida. It is found in still and moving waters. Naturally enough it favours the overgrown parts which afford it good protection against larger fishes.

BOOK REVIEW

Aquarium Technology by A. Jenno, published by Barry Shurlock Ltd. at £3.50.

While most books concerned with fishkeeping deal with species of aquarium fishes and instruct on the different techniques imposed by their individual characteristics, this work sets out to supply the aquarist with detailed information on the mechanics of aquarium keeping and answers many of those questions regarding types of lighting, heating, filtration, etc., which can be but briefly covered elsewhere.

Commencing with a survey of the aquatic environment in which water characteristics, air and light requirements, food, temperature and the nitrogen cycle are covered very comprehensively, the author then diversifies and describes the various environmental systems currently in use and so leads the reader to the ultimate threshold of selecting his mechanical hardware for the purpose in mind. In a chapter on heating apparatus and aquarium thermostats he provides useful protection circuits and outlines the uses of base and space-heating.

Under Air Supplies different pump types are discussed and useful diagrams included to illustrate the workings as is also the case with the section on filters. Lighting is well covered in a section which includes tables of comparative output afforded by the variety of sources available, as well as tables of comparison for colour distribution.

While recommending strongly the assistance of a competent electrician to the aquarist embarking upon the installation of his first aquarium, the author feels that some information regarding electrical theory is likely to be of great benefit and so supplies this need in a straightforward and acceptable form with emphasis upon safety throughout.

Lest it be thought that the fish have been entirely omitted from what hitherto may have appeared a treatise on gadgetry only, reference must be made to other solid chapters within this book which deal with Breeding and Quantity Production with sections covering livebearers, shoaling egglayers and protective egglayers; Foods and Feeding with methods of preparing cultured foods, table foods and natural foods. A final chapter is to do with tests and measurements and the chemistry of water.

Two useful appendices comprise Further Reading and The Electrical Appliance (Safety) Regulations 1975.

How Invertebrates Live by Dr. Kaye Mash, published by Elsevier Phaidon.

Invertebrates, those lesser beings which have long been regarded by many with feelings of revulsion or as not worthy of too much attention, have gained a firmer footing on the popularity charts of recent years. This has been due, in part, to the advances in colour photography and the resultant colour films on television along with superbly illustrated books. So far as the aquarist is concerned, the increasing numbers of devotees of saltwater aquarium keeping has sharpened the interest in marine invertebrates as part and parcel of the coral-fish tank's furnishings. The book under review covers the world of invertebrates other than insects and so embraces many of the life-forms which are of particular interest to the aquarist.

In total, invertebrates comprise 95 per cent of the animal kingdom and the variety of their forms and life style is boundless, not to mention their range of size from the microscopic to the fifty-foot long giant squid. If numbers of species supports a claim for meriting more study, the invertebrates top the list. With snails comprising 852,000 and clams 128,000, mammals with only 4,000 species fall way behind and *all* the vertebrates can show a species total of only 43,000. These figures are impressive and rightly so but it is when we begin to examine some of the bizarre variations closely that the beauty and fascination of these creatures assume their true significance.

The author, a former lecturer in zoology at King's College, University of London, smoothly conducts the reader of this book through chapters covering general structure, the ways in which invertebrates feed, their sense organs, reproductive methods and myriad of behaviour patterns. Splendidly illustrated with colour photographs this handsome volume is one of a fine series of books published under the heading of *How Animals Live* and is priced at £39.5.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A., A.C.P.

Photographs by the Author



DESPITE THE fact that the long hot summer continues, numbers of readers have found enough energy to write to me expressing their opinions on a variety of subjects. Mr. Stuart Gould's letter has just reached me from his home at 15 Langley Road, Selsdon, Surrey. He begins: "I would like to comment on your remark regarding the tableaux displays at fish shows. When, through a friend, I became interested in fish keeping as a hobby I decided to gain as much theoretical knowledge as possible before embarking on what has become a most pleasurable pursuit. I bought books, wrote to manufacturers, read *The Aquarist* from cover to cover again and again, and also wrote to your colleague Mr. Jack Hems. I thought that a trip to one of the larger shows would also be of benefit so I attended one held locally in London. There they were, looking like a creation one sees in the classroom occupied by seven year olds on open day. Oh no, I thought, surely this isn't what serious fish keeping is all about; and I'm sorry to say that this put me off joining any aquarists' society. These tableaux must surely join the plastic paraphernalia that you mention; and for my part I would throw in those horrendous gnomes with which people seem to litter their gardens."

Mr. Gould continues: "You also mention the breeding of angel fish. I have just observed my pair, for the second time in approximately three months, drive all the other occupants of my community tank up to one end and then proceed to lay and fertilize their eggs on the same Amazon sword leaf. This they defend ferociously for a while but whenever I return to see how things are going the eggs have always disappeared. Is it usual for angels to get this far in a community tank? I would like to take this opportunity to tell you about my—and I'm having to look this up—*Pantodon buchholzi*, or as I like to call him, butterfly fish. I wonder if any other readers have had experience with this intriguing fish? I had been looking for one to complete my community tank for a long time. A well-known shop in London always used to stock them but of course when I went to get one they didn't have any. I finally came across one in a dealer's tank that housed some rather sorrowful looking cichlids as well. There were fish that were dying, fish that were dead on

the floor, and a few tatty butterfly fish minus most of their fins, tails, etc. It was against my principles to buy from a tank such as this but now I'm so very glad that I made this one exception. It's amazing what a little care and consideration can do for now I have a splendid specimen with all its full regalia returned to it. Its diet consists of grasshoppers, moths, *Daphnia*, *Tubifex* held from above by a pair of tweezers; spiders—even those big ones you find in the bath—and almost any insect I can catch. To my surprise he will even take flake food that floats on the surface—which will be of benefit during the winter and allay the fears I had of keeping him through this difficult period. He greedily gobbles up those *Daphnia* that swim dizzily about on the surface, and has the ability to change colour to a certain extent. He seems able to 'home in' on an insect and has phenomenal speed and reactions. Even if I put say a spider in the tank when it is pitch black it is not long before you hear a few thrashes in the water and know that it is all over. He also loves freshly swatted flies but I am a bit dubious about this source of food in case any of the flies have been subjected to fly spray or some other repellent as I'm sure this would prove fatal.

"The flies often find their way into the pair of Congo salmon that often race to the surface and snatch them when the opportunity arises. The dealer suggested woodlice as a source of food but I'm sorry to relate that the one I tried sank immediately, was discovered half-way down by two of my clown loaches who thought they were dolphins and began to toss it about with their noses, and finally reached the bottom of the tank where I fished it out and granted a reprieve. That just leaves me to thank you for your entertaining column." (It is not uncommon for angels to spawn in a community tank—but they usually don't get an opportunity to raise their young. What do other readers think about tableaux displays at shows?)

Photograph 1 shows the Indian or Sumatra fern, also known as water sprite. Its correct name is *Ceratopteris thalictroides*. Under what conditions do you find this plant grows best?

Mrs. Susan Cameron writes to us from 52 Hunter Road, Crossdene, Crosshouse, Ayrshire. "In your

last article you asked if anyone had tried water with the oxygen boiled out of it to kill an ailing fish. Since reading your vet's suggestion that this would be a painless and simple method I have tried it twice—and in both cases it worked well. Though the situation rarely arises, thank goodness, it is a decision I am loth to take even when the fish is obviously incurable; however, when the fish seems to be suffering or is in danger of being attacked by its tank mates I think that the kindest thing to do is to let it die quickly and peacefully in its usual surroundings. What I did was to pour boiling water into a glass jar, filling it up completely. I warmed the jar first to prevent the boiling water from shattering it, and stood it in a basin just in case it did. Then I screwed the lid on to the jar making sure that not even a bubble of air was left in the jar to re-oxygenate the water. As the water cools it contracts a little and makes the lid stiff to unscrew, but not too stiff, and each time I remove the lid to test if the water in the jar had cooled to the temperature of the fish tank I topped it up with a little boiling water to ensure that there was no air trapped in the jar when I put the lid back on. When the water had cooled to the temperature of the water housing the ailing fish, I put the fish in the jar, screwed on the lid, and sunk it in the fish tank so the fish would see its usual surroundings and the water in the jar would not get cooled before the fish had died.

"I used this method on an aged female guppy first. Her back was bent and she could no longer swim or eat, but refused to die naturally. I had to go out and so could not time her demise; but when I returned a few hours later she was dead. The second fish was a neon tetra with neon disease, that was having difficulty swimming and the fins of which were being nipped by other fish. It stayed quite peacefully in the jar for some time then swam to the surface for a few minutes, then down to the bottom. It was dead in thirty minutes all told. I think this must be the best way to dispose of a sick fish unless it is too big to make this practicable, in which case I suppose one would have to ask the vet to prescribe a drug to add to its tank water.

The pronunciations of the proper biological names of fishes and plants frequently give difficulties to numbers of aquarists. The following letter, received from Mr. Laurence Sandfield, who lives at 25 Leighton Road, London W13 9EL, should assist with some of the difficulties. "Upon reading the August W.Y.O.? I was astounded to learn that some of your readers find the pronunciation of the Binominal System difficult. I've never had any trouble, but I'm willing to put my system of pronunciation at the disposal of anyone who does find things a little awkward. I'll describe it first and explain it afterwards. 'A' is always as in 'hat', 'ah'

or 'calm'; never as in 'ray' or 'hate'. 'Ch' is always hard, as in 'school' or 'ache'; never soft, as in 'child'. 'G' is always hard, as in 'get' or 'gate'. Generally speaking, 'ei' is 'ay', 'ai' is 'eye', and the letter 'i' on the end of a word such as 'inness' is short as in 'pit'. The letter 'y' is generally 'eye' but sometimes this is a short 'i' also. 'Ph' is a voiceless 'FF' as in 'photograph'. The diphthong 'ae' is usually 'ay' or 'eye', more correctly the latter. A 'P' at the beginning of a word like 'Pterophyllum' I usually leave silent, as in 'pneumatic', but it is permissible to sound it. As a general rule, sound every letter in the word, taking into account the foregoing.

"Now a few examples. *Aponogeton*: A-pon-oh-get-on. (P)terro-ffeye-lum ska-lah-re (*Pterophyllum scalare*). *Paracheirodon innessi*: Para-kay-rohdon inn-esse-e. Explanation: the names in the Binominal System are Classic Greek and Latin; the Generic



title (first name) is Greek; the trivial name (second name) is Latin. In some cases proper nouns (*Axelrod's*) are faked up to look like these languages, and in others native names are treated the same way. The same rules apply. Example: *Pristella riddlei*. This commemorates a Mr. Riddle, and is *Pris-tella riddle-eye* (not riddle-ee-eye). Now, all Greek names are pronounced not according to modern Greek but according to the Revised pronunciation of classic Greek, which is the nearest modern scholars can get to the Greek of classic times. It thus remains constant in idiom as the dead language Latin does and can be used by people of all nations as a systematic method of naming the fauna and flora of this planet. Modern Greek is different and it changes. The letter 'beta', which is 'B' in the Revised, is 'V' in the modern. To give just a few more examples, 'algae', the plural of 'alga', is pronounced "all-geye" and not "owl-jee" which is illiterate." (A point of interest: the late

Professor G. N. Garmonsway, Professor of English Literature in the University of London, King's College, gives 'aljee' as the pronunciation of 'algae', with the 'a' pronounced as in 'cat', in *The Penguin English Dictionary*. B.W.) Mr. Sandfield goes on: "The letter 'C' always bothers me because mostly it is used to replace the Greek letter 'kappa' which is 'K'. This leads me to pronounce 'Cyprinid' as Keye-prin-id and 'Cynolebias' as 'Keye-noh-lee-bee-as' and people correct me. They are wrong to do so as, strictly, I am correct. But if you want to go on saying 'Sigh-prinid' by all means continue to do so. Both are acceptable. 'Gimno-corimbus ter-net-ze' will do very well for the black widow; and 'Heye-fless-oh-breye-kon' for 'Hyphessobrycon'. So, therefore, follow these simple rules and pronounce every letter in the word; and remember one thing: there is no such thing as a big word; every word in every spoken language is small enough to fit in a child's



mouth, for it is as children that we learn to speak.

"If you see an 'X' at the beginning of a word, call it 'Z'. It's much easier than the Greek pronunciation. You all know one: 'Xiphophorus'—'Ziffo-for-us'. Should any of you care to take your understanding of these things a little further, Smith's will sell you *Teach Yourself Greek* by F. Kinchin Smith and T. W. Melluish for 80p in paperback which will give you great insight into this lovely and fascinating language. You won't learn to speak Greek; but if you have an efficient brain, which I lack, you will learn to read it and it will give you an even greater, because lingually more extensive, joy in your fish keeping. Remember: every fifth English word is a Greek one. What a start you've got!"

Photograph 2 is of a convict cichlid. Please send me details of your experiences with this species

kept with other fishes.

The fish shown on page 139 of the July edition (photograph courtesy of High Street Aquatics) has been identified as *Pangasius sutchi*, the Siamese shark, a member of the catfish family *Schilbeidae*, by Mr. J. Neill of Larne. Mr. Neill says that the fish is fairly peaceful and can reach about 7 in. in length.

I've just returned from an extremely hot, tiring, expensive and enjoyable holiday in London. I was pleased to visit Mr. Douglas Rose's home to see how his aquaria are progressing. His piranha continues to grow and its teeth look even more frightening than before. Douglas's marines continue to thrive and his marine aquarium remains the most beautiful I have yet seen. Some of his marine fishes now seem like very old friends and appear to be as permanent as the Tower of London.

Recently I purchased a copy of Mr. A. Jenno's new book, *Aquarium Technology—Fundamentals, Equip-*

ment and Practice (published by Barry Shurlock & Co. (Publishers) Ltd., price £3.50). I found the book most interesting and stimulating and can thoroughly recommend it to readers of this magazine. It contains a wealth of information, particularly about equipment for the aquarist. In a foreword to the book our Editor, Mr. L. E. Perkins, writes: "... A work of this kind is much needed and will afford relief to many a frustrated aquarist." A copy of Mr. Jenno's book would certainly make a very useful reference work for adding to one's shelf of books about aquaria.

My best wishes go to Mr. Steven Waterhouse whose latest letter reached me from the Cavalieri Hilton, Roma. Steven, who is about to move on to Germany, is presently awaiting his G.C.E. 'O' level results and will soon be studying fish culture at both a college and a fish farm. He has promised to let me

know of his adventures on the fish farm. Steven's career should be a most interesting one!

"I am prompted by your comments to write my first letter. I wished to get details of aquatic plants from an advertiser in *The Aquarist* and requested a copy of their list, enclosing a first class s.a.e. and sending my letter by first class mail. That was about a month ago and to date I have received nothing." These comments reached me from Mr. J. E. Morris, of "Charis," 5 Ivy House Estate, Gorsley, Ross-on-Wye, Herefordshire, and I have received at least one other letter complaining about the same firm. Hopefully the situation may have improved by now. Mr. Morris continues: "I have been keeping fish, both cold water and tropical, on and off since 1939—the off periods being due to my moving around the country. Back in 1946-47 I had regular correspondence with one Gene Wolfsheimer of California, and we carried out an experiment with killifish eggs sent over to me by air mail. I cannot recall reading of this being done by anyone before that date. What are your readers' comments about the value to the hobby of the tableaux tanks so often seen at the big shows? Although showing in many cases great originality, it is my opinion that the effort could be directed into more useful fish keeping channels."

Mr. D. Caldow lives at 5 St. Martin's Road, Scawby, Brigg, South Humberside. He states: "Your controversial statement about tableaux displays in August's magazine was excellent and I heartily endorse everything you said. Some of the shows which encourage these tableaux could be made the finest open shows in the country if they did not insist on no tableaux, no entries, which they do. You also asked about aquarium shows. I attend one almost every Sunday in the summer and am reasonably successful. The only criticism I have with a lot of them is the long wait between the end of judging and the presentation of prizes, which is sometimes as long as two hours. This is most frustrating when perhaps you have eighty or one hundred miles to travel home. Apart from that, most shows are very enjoyable, win or lose." (Mr. Caldow enclosed with his letter a very acceptable coloured photograph of his discus and angel tank. It was taken by his wife, using a Kodak Instamatic camera "held higher than the tank to get rid of the flash reflection.")

Mr. Jeff Hutchings resides at 25 Stanley Croft, Woodplumpton, Preston, Lancs. He tells us: "May I start by making reference to Mr. J. Dymott's comments in the June feature. Sadly his comments portray the general lack of knowledge and appreciation of many aquarists of the guppy. This is no fault of the aquarist because most of the guppies he will have seen will be the large broadtail types produced in the millions in Singapore and then exported to this country. Because of commercial pressure these

fish are not selected and both good and bad fish are sent. I do not think that his comments regarding wild males are correct at all as the wild male is a relatively insignificant fish being only an inch in length and having only a few patches of colour on the body. Is it not true that with any species the male has only one major purpose in life: to procreate?"

"Reference is made only to broadtail guppies. There are several other types of guppy kept by enthusiasts including swordtails, top, bottom and double, lyretails, coffer, pin and scarftails. These fish have been kept and developed since the beginning of the century. Indeed, as this is being typed guppies are flying high up in a Russian space ship as part of an experiment to see what effect weightlessness has on fish. If Mr. Dymott would like to see some of these other types of guppies then he would be made very welcome at an F.G.A. Section meeting held in Preston on the third Sunday of the month at St. Margaret's Church Hall, Tag Lane, Ingol. Several times recently I have heard the comment: 'I can't get any good breeding stock anywhere.' If anyone is looking for good guppies then let me or the F.G.A. Stock Control Officer know and we will try and fix you up; the only cost being transport and membership subscription. If you wish to specialise in a species then the ideal way of going about it is to join the appropriate specialist association. The Fancy Guppy Association is a National Association and anybody interested in joining can be put in touch with existing members in their area. A monthly Journal full of information on guppies is produced and Sections hold meetings at Edmonton, Radlett and Rotherhythe in the London area, and Birmingham in the Midlands, and Preston in the north. At the moment efforts are being made to start a Section in South Wales. If you are interested then contact Mrs. P. Purdy at 30 Church Street, Ebbw Vale, Monmouth. It is also possible that a Section may be formed in Scotland in the not too distant future."

"Mr. Whiteside asked for experiences in breeding short-tail guppies. I have bred several types but my favourite is the Viennese Green double sword. As its name implies, this fish was developed in Austria. The objective is to produce a male whose body and caudal lengths are the same, with a long pointed dorsal. This strain has an overall green colour with red, blue, black and yellow markings. In breeding this fish care must be taken to select the right breeding stock. One fault with some strains is that the extensions do not spread correctly; and another is that the dorsal becomes thick and blunt. It is important that the breeder appreciates that there is more to guppy breeding than putting a male and a female together."

Mr. Alan G. Clements writes to us in a lighter vein from 23 Gogarth Avenue, Penmaenmawr,

Gwynedd, N. Wales. "In your May issue a question was asked about getting rid of aquarium snails. I have come to the conclusion that cleaning and disinfecting tanks and their contents is a sheer waste of time and suggest the following method. First, buy a house at least fifty miles away. In this house, before you move in, install brand new tanks, heaters, filters, thermometers and gravel. Then, in the middle of a very dark night, complete with vivid lightning, crashing thunder and pouring rain, quickly catch your fish, put them, in suitable containers, in a plain dark van, and belt off to your new house using devious roundabout routes. Put the fish in the brand new tanks; do not put any plants in, and all should be well. But be careful not to discuss your plans in the room where your tanks are; remember, walls have ears—and this may also apply to glass walls. Then you sell your house, complete with tanks, plants, equipment and snails. The purchaser will probably buy some fish. Ah well, let him find out the hard way. If anyone can tell me how to get rid of my snails without resorting to these measures I would be eternally grateful." (As an alternative go to your dealer, ask him to sell you an appropriate snail killer, and carry out the manufacturer's instructions to the letter. Siphon out the snails regularly—as the instructions will tell you to do—and repeat the treatment when any new baby snails hatch out from eggs that may have survived the original treatment. The maker's instructions should supply full information. I have over the years tested several such products with very acceptable results and with no harm resulting to either fish or plants. In some cases snails could be seen to drop dead from plants' leaves a matter of seconds after the chemical killer was introduced. Some aquarists and writers tend to frown upon the introduction of any chemicals into a planted and stocked aquarium. If used only when necessary, and exactly to instructions provided, no harm should result. After all, tap water added to a tank contains chemicals—as do fish foods, 'cures', etc. Glass, rocks and gravel slowly dissolve in water—although one should avoid rocks and gravel containing calcium carbonate. If snails or algae get out of control in an aquariums and other methods of control fail, I see no harm in resorting to the use of safe brands of chemical killers. It's difficult to keep algae and snails out of aquaria.)

Mr. C. Thompson wrote to me recently from his home at 133 Erskine Park, Ballyclare, County Antrim, asking for sources from which he could obtain fancy coldwater fish. Recently I mentioned having seen a wide selection of fancy goldfish, shubunkins, koi, rudd and orfe on sale locally and in England. Recently my sister presented me with £10.00 and asked me to set up a small coldwater aquarium for her eleven months old son. (It came as rather a surprise to

me as during our childhood and teenage years my sister hadn't shown even the slightest interest in the numerous fish tanks with which I littered our family home.) I purchased an 18 in. x 10 in. x 10 in. all-glass tank complete with plastic frame and hood. I supplied the calcium carbonate-free gravel and rocks, plus some plants of hornwort, *Elodea* and Indian fern from one of my tropical tanks; and I bought five small fancy goldfish locally. The total cost of the tank, hood and fish was £10.00. I installed the aquarium in the glass doored entrance hall of my sister's bungalow and both fish and plants are thriving. My young nephew, Colin, takes a great interest in his fish and has certainly got an exceptionally early introduction to the hobby. It's many years since I last purchased coldwater fish and I must admit that the attractive colours and shapes of the fancy goldfish could more than hold their own against any of my tropical fish. The very hot weather is keeping the fish very active and the plants are growing at an astonishing rate. The fish will obviously grow too large for the little tank—but their attractive colours and shapes have virtually made me decide to convert one of my tropical tanks to a coldwater aquarium. Those of us who started off with coldwater fish many years ago and then graduated to tropicals tend to consider the latter fish to be more sophisticated and we overlook the real beauty of good coldwater specimens. I've discovered that we may be missing a branch of the hobby that is equally as attractive as the tropical side. It's worth some consideration when one considers the rising costs of heating tanks—although aquarium heaters must be using very little electricity this summer. If water levels continue to drop in the reservoirs we may soon be wondering whether or not it's ethical to use precious water in which to keep any species of fish! What effect has the surfeit of sun and heat, and the shortage of water, had on your garden pond?

Miss Susan Hatton writes to us from 70 Fortune Green Road, London, N.W.8: "In a recent edition you asked for opinions on the raising of the fry of dwarf gouramies. I will be interested to read your readers' replies as I have had considerable trouble myself. To date my pair of dwarf gouramies has successfully reared fry three times to the free swimming stage. I have succeeded in rearing fry only to the age of four weeks. On the first occasion I removed the parents as soon as the fry were visible but before they were free swimming. They all died within two days. The second time I left the parents with the young until they were free swimming. I fed the fry on infusoria which were fed continuously by a slow drip method. The fry grew large enough to be fed on microworms and again were fed copious quantities. One day when they were about four weeks old I returned home to find that every single one

was dead. The cause still remains a mystery. On the third occasion the fry lived until about two or three weeks of age, by which time one individual was *much* bigger than the others. The numbers of fry slowly dwindled due, I suspect, to the big fellow feasting on his fellow mates! He lived until about four weeks of age and was 1 in. long. Unfortunately I had to go away on holiday and I was unable to find anyone to feed him. On my return he was no more. Who knows, he might have grown into a king sized dwarf gourami! In all cases the temperature was 76-78°F and once the parents were removed the tank was lightly aerated. I think that the Aquarists' Exchange Group is an excellent idea. I wish Mr. Matthews luck and I look forward to my first list. Could you please publish details of the Cichlid Exchange Group as I missed them the first time round and would be interested in joining."



(I'd be pleased to publish the latest information if a member of the group would be kind enough to send me details of the group's progress.)

Photograph 3 shows the tiger barb. Please send me details of your experiences with this species.

"Regarding the euthanasia of ailing or unwanted tropical fish, the method I use is as follows. Get a small bowl and fill with ice cubes and a little cold-water so that the liquid itself reaches freezing point. If you drop the fish in it is dead instantly. Incidentally, is there any reader in Leicestershire who breeds guppies successfully? I used to have no trouble with fancy guppies a few years ago, but now gravid females refuse to give birth and the males die within a few weeks of purchase; yet mollies, swordtails and platies all increase in numbers—even in a community tank. Perhaps there has been

a change in the water supply. We used to be supplied from Chernwood Reservoir but a few years ago a new pipeline was laid from the Dove river in Derbyshire. All plants grow well except *Vallisneria spiralis*, and I used to give away bunches of this as it used to choke my tank. I expect the two happenings are related." The above letter was written by Mr. Fergus Kenny, whose home is at number 37 Humberstone Lane, Thurmaston, Leics. (It was written earlier in the year, before water supplies were affected by the summer drought.)

Readers are reminded that I do not necessarily agree with the views expressed by those whose letters are published in this feature. New readers wishing to contribute should write to me c/o *The Aquarist & Pondkeeper*, The Butts, Half Acre, Brentford, Middlesex. Please PRINT your name and address, write on only one side of each page, number all

pages, put the date on your letter, and don't make the letter too long as I like to fit in as many different readers' opinions as possible. I'd be pleased to have suggestions for problems that could be posed in future editions.

The next letter this month comes from Mr. Douglas Renton, whose address is 128 Dunstan Tower, Garth 18, Killingworth, Newcastle upon Tyne. Mr. Renton, who is Chairman of the Newcastle Guppy and Livebearer Society, has the following to say: "As chairman of a society that specialises in livebearers—the Newcastle Guppy & Livebearer Society—I found Bob Purdy's article, entitled 'Three new species of Livebearer', in the March issue, extremely interesting. It is my opinion that most dealers seem to be uninterested when it comes to importing wild or lesser known varieties of livebearer. The standard

answer to any request seems to be: no demand, no colour and therefore, no interest; but for all that, the keeping of livebearers of every variety seems to be on the increase, thanks not to the dealers but to certain individuals and my own society, who have acquired stock for themselves. At the moment my wife and I are concentrating on two very rare species, the redtailed Goodei—*Xenotoca eiseni*, and *Brachy rhabdis rhabdophera*, both species having extremely attractive coloration.

"Through our corresponding membership—which, incidentally, is open to anyone interested in livebearers and who wants to receive our newsletter—we have found that the keeping of livebearers is not only increasing in Great Britain but is also thriving in many other countries as we regularly hear from our exchange clubs in Europe and the U.S.A. I think that with the advent of Rift Valley cichlids and discus breeding in this country in recent years, other fish seem to have been pushed out of the limelight to a certain degree. As Mr. Purdy said, there is quite a selection to choose from when it comes to livebearers; in fact he was a little out in his estimate of 50 species suitable for the aquarium. In Jacob's book *Livebearing Aquarium Fishes* 156 species are listed—and this is not complete—with almost all suitable for the aquarium; but unfortunately most are unobtainable in this country."

Our final letter is from Mr. B. L. Richards who lives at 28 Lonsdale Road, Branston, Burton-on-Trent, Staffs. He tells us: "As I rarely receive my *Aquarist* before the mid-month I feel any comments on any point you make at the end of *W.Y.O.*? would be of little use to you. However, your comments on tableaux displays have prompted me to write..." (I'll interrupt here to point out that it's never too late to send an opinion on any given topic. I receive many letters each month and some are held over until future editions some months away. This allows me to group together a number of letters on one subject and permits me to take account of seasonal changes. As interesting and original opinions do not go out of date, don't worry if your replies to any given topic are not sent to me for a month or two after the original query has been posed). Mr. Richards continues: "I rarely visit shows as I feel they do not present the best side of our hobby, but last year I paid a visit to Belle Vue. I was amazed to see the way in which some tanks were displayed. I spent some time afterwards considering whether I was at fault in missing the point of giant vacuum cleaners, lunar modules, etc. I now feel there is no point whatsoever. Surely the prime function of a fish show is to display the fish as clearly and as attractively as possible using the basics of our hobby. Certainly such tableaux do not help to display the fish clearly; indeed, on one display I spent some time trying to find the

fish at all. When I succeeded the tank was so small it looked ridiculous in the huge structure that housed it. I also feel that the tableaux in no way enhance the beauty of the tank. To an aquarist the attractiveness of a tank comes from the inside of the aquarium; the surroundings are largely irrelevant. Maybe that one word, 'irrelevant', sums up my thoughts on such monstrosities.

"In actual fact I do not view shows with much delight anyway, especially the two-day variety which I feel do not present fish at their best. Indeed, I am sure that the true aquarist would not subject a prize specimen to a show; consequently the better fish of a species never appear at shows. My main interest is keeping the Rift Valley cichlids, surely the most fascinating and diverse species found in any one area. Recently I introduced a number of wild caught Malawi cichlids into a 48 in. tank, but was soon troubled by twitching, scratching fish, obviously being badly affected by a parasite. Reaction to 'new' water was ruled out. All the usual medications failed and the fish became increasingly distressed; so on the advice of two cichlid experts I took more drastic action. Once capsule of (a well-known brand of treatment consisting of pure liquid phenoxetol) was mixed with one gallon of water—four times the maximum dose—and each fish was placed in the solution until it rolled on its back and stopped breathing—when it was returned at once to the aquarium, where the time taken for returning to normal varied from 30 seconds to 10 minutes. All fish were eating within 20 minutes. All manifestations of irritation have disappeared completely. I have seen a fish covered in fungus placed in the solution and removed some twenty seconds later with no sign of infection at all; nor did it return later. I would not suggest such treatment for small fish such as tetras, gouramies, etc., but for such strong fish as cichlids I find it very useful, especially as I do not like adding chemicals to my aquarium water if they are to remain there for any length of time. I have found one well-known brand of white spot cure—using methylene blue—which actually burns the fish if there is any salt in the water—as there is in the Malawi tank I have—despite suggestions to the contrary by the manufacturer.

"Regarding another query in *W.Y.O.*? I find earthworms an excellent food, eaten greedily by all fish; but how do I get them in the present drought? My garden has never received so much attention with a spade, but to no avail. It seems my fish will have to forget worms until it rains. Even my *Daphnia* pond has dried up!

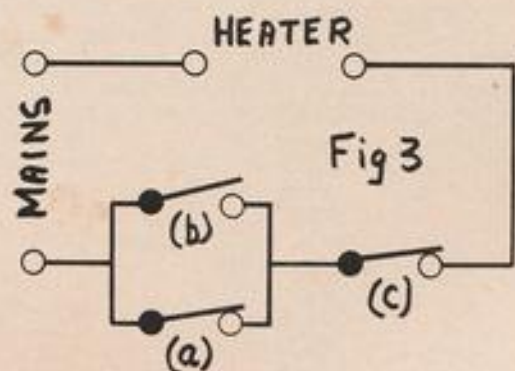
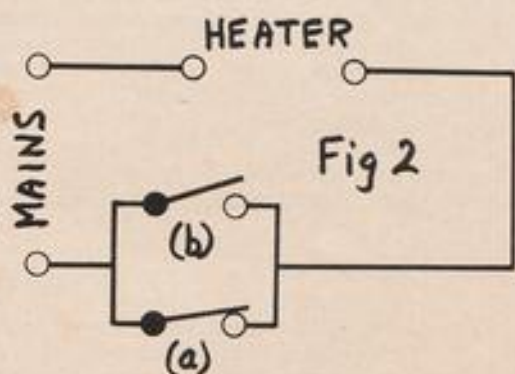
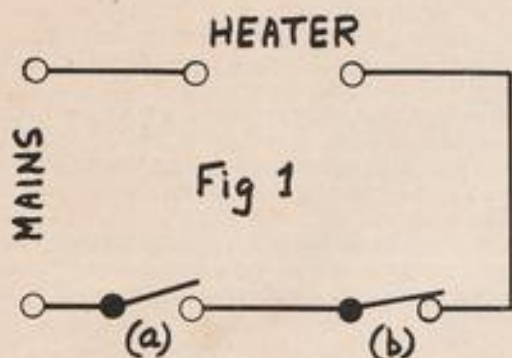
"An afterthought: when treating fish with (the phenoxetol preparation) the fish swim calmly round the container until they slowly turn over; within a

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PROTECTION SYSTEMS FOR THERMOSTATS

by

John Richards



A FEW WEEKS AGO, whilst buying some plants at my local aquatic pet shop, I heard the sad story of a man from Banbury who had just lost the entire stock of fish from four tanks due to a thermostat fault. At about the same time I read in the pages of this magazine about a gent who had lost some Platies, Angel Fish and a Coolie Loach from the same cause. These two incidents caused me to reflect again upon the old question of thermostats. In the "early days" of our hobby thermostat failure was not uncommon, but today, with the excellent instruments which are on the market these incidents are rare. Nevertheless even the best thermostat can go wrong and the man who runs a number of equal size tanks from one thermostat, or perhaps has one large tank housing expensive marine animals, cannot afford to take chances. With these thoughts in mind, I pass on the details of three protection systems, one of which I installed in my own tank some years ago. Each system uses more than one thermostat.

Thermostats can fail in two ways; they either don't switch on or they don't switch off, and of the two the more serious, in my view, is the latter since it usually takes effect more quickly. If, on the other hand, the thermostat fails to switch on, the tank slowly cools and it may be the best part of a day before any serious harm is done, particularly if the tank is situated in a warm room.

Two thermostats in series protect against the contacts failing to open; the circuit is shown in fig. 1. The best plan is to set thermostat *a* at 78 and *b* at about 82, then the contacts of *b* remain in pristine condition until they are needed. It will be apparent that the normal switching duties are carried out by *a*, and *b* is on standby in case *a* fails.

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Fish Stamps

I was interested to read the article by Mr. Roger T. Chambers on Fish and Stamps in the August issue.

I have collected stamps with a fish theme for the last 10 years. It was when I joined the now defunct West Bed. Central Philatelic Society in 1956 that it was suggested I collect Fish stamps to complement my other hobby of Fish keeping.

During this period a pen friend I had provided me with a fairly comprehensive list of Fish stamps which I have tried to maintain.

There are, however, one or two parts in the article with which I disagree. The first is that there are two stamps issued by Great Britain which have fish on them. These are the ½d. green and 1½d. brown of King George V. The other point is that if the collector decides to collect only mint (unused) stamps he will find that he will not be able to buy single stamps out of a general set. Most dealers only sell whole sets; they do not break up a set where, say, there are 10 stamps of a general nature and only one with a fish. The thematic collector will have to buy the set. However, if he collects used stamps he will have to wait for them to appear in the dealers' books which can take months. There are, of course, the new issues services, but I know of only one that will provide just one stamp out of a general set. This method can, however, prove expensive when one finds several long sets of fish issued in a month.

There have been issued over 1,500 stamps with fish on them. Of these, I have approximately 1,100.

It does not, however, end with just collecting stamps. One finds that one looks for first-day covers. These are covers posted on the first day of issue of a set of stamps, miniature sheets and postmarks.

The way one sets out the stamps is one of preference. At first you will be able to keep them in sets. However, as the collection progresses it may be found easier to break the collection down and set them out in species and families. My collection is in species starting with freshwater tropical aquarium-kept fishes which then leads into freshwater coldwater fishes and finally marines.

I still take my collection to various societies and talk about them to various clubs in and around London. This includes aquarist, angling and philatelic societies. I should also point out that I am on the speakers' panel

of the Federation of British Aquatic Societies.

JOHN A. KETTLE,
London.

Start Right

How refreshing to read an article (Viewpoint July) supporting the specialist aquarium shop. It is a great pity that it could not be read by all who are about to join as beginners to the hobby. So often we have to give advice and help to the disappointed and disillusioned who have bought unwise and costly equipment which was not necessary to start with.

How often we hear "my plants won't grow" when they have had little or no advice on lighting. The family who have proudly set up their first tank only to be sold a "beautiful fish" which devoured all the others in a day.

Whether it is a goldfish in a plastic bowl, a tropical set-up or marine aquaria, each and all should have a good start with a reasonable chance of survival.

K. N. WELLS,
Catford Aquaria,
Bradgate Road, S.E.6.

Gone away

Could you please publish this letter in your 'readers write' column. Our society is trying to trace the firm that holds our club's badge die. The firm's last known address is:

P. ORR & SONS (PTE) LTD.,
49-50 Audrey House,
Ely Place,
London EC1.

All our letters sent to this address have been returned.

I. R. BURNAGE,
Secretary, Bedford and District
Aquarist Society,
12 College Street,
Kempston, Beds.

Inter-Club

Our society is considering trying to organise an Inter-Club League, and we would be very pleased to receive any guidance or tips from any society already involved in a successful venture. In particular any pitfalls or problems which could, perhaps, be avoided with fore knowledge.

We would also be pleased to hear from any society which would be interested in taking part.

E. JONES,
Hon. Sec. Wrexham T.F.S.,
2 Parkfield,
Gresford Park,
Gresford,
Nr. Wrexham,
Clwyd.

Dear Sir,

Maybe some of your readers will be interested in the following:

On 4 July about 7 o'clock in the evening I witnessed an amazing and wonderful sight. One of my female tortoises (5 years in this Country) was digging a hole using her back legs only. She struggled, one leg at a time, lifting the very dry soil which continuously fell back into the centre of the hole. After many attempts she left this patch and proceeded a short distance away to start again. She again went through the laborious task of lifting the soil with one back leg at a time, getting slower and slower. At no time did she moisten the soil but from time to time she pointed her tailpiece downwards as if measuring the depth. At last she was practically vertical and then I could see a small white spot which expanded as she pushed vigorously until the egg was half out. She paused, then one final heave and it dropped in the centre of the hole but as she was so erect it only had $\frac{1}{2}$ in. drop. Once again, using her back legs, she moved the egg to one side to make room for the next one. The second one was also an effort but the third and subsequent ones were easier. She carried on until she had a batch of 6. Each time she moved over the egg to allow space for the next, at the same time partly covering with earth and treading the soil until they were all covered. She then filled up the soil to ground level, slowly but efficiently, treading all the time until she had quite a big area to cover, much larger than the original hole. When completely satisfied she walked off slowly to her night quarters. I knew, of course, that once the weather changed the eggs would not hatch so I immediately got a bowl and spade to dig them up. I thought it would be easy to take the whole batch without disturbing them but was astonished to find only 2 eggs in my pile of earth so I sifted my fingers through the earth and they were all spaced out in an area as large as the surface. She had obviously done this with all the treading movements to give them plenty of space when hatching. Another amazing fact was the temperature of the soil; it was really hot as I poured it over the eggs. I had read that the eggs must be transferred in the same position as layed but I could not do this as the fine dry soil just fell away so I put them in and hoped for the best. I now have them in an airing cupboard and hope to report at a later date a successful hatching of little ones.

MADGE BINGHAM,
83 High Street,
Codford St. Mary,
Wilts.

P.S. Through holidays, etc., I did not send this when written so now can continue: Sept 3rd. One egg reached the surface of the bowl and after struggling for a day the young tortoise emerged. Sept 4th second

egg surfaced and tortoise emerged on 5th. Two more surfaced that evening and emerged today 6th, and the 5th one is just showing. I have photographs of them and they weigh in between $\frac{1}{2}$ and $\frac{3}{4}$ oz. and the second born is already eating minute particles of tomato.

In Recognition

There's gravel in the Hoover,
There's gravel on the floor,
There's a leaky paper sack of it reclining by the door.
There are weeds and sundry nasty things floating in the loo;
The kids refuse to use it. What am I to do?
In the bathroom basin tubifex abound,
With a bucketful of daphnia in which a mouse got drowned.
In the airing cupboard is a jar that looks most suspicious,
I really can't believe it . . . but it looks like rotting lettuce!
In a home made incubator he is hatching little eggs,
And as it's not escape-proof—I hope they don't have legs!
There ought to be a prize,
Some sort of recognition,
For the aquarist's wife with the best disposition . . .
PATRICIA IRWIN,
The Old Chapel, Barton Grange,
Corfe, Taunton, Somerset.

PRESS RELEASE

IN ORDER to protect the connections of the fluorescent tubes against dampness or corrosion, Impelec Limited are introducing a new waterproof rubber cap manufactured by RENA.

Its design allows the tube to be laid down on any surface. The only thing to be done is to push both rubber caps onto the fluorescent tube and connect the wires.

The material used is high quality silicone rubber which has a good resistance to most dilute acids.

Each cap is attached to a two metre cable and come packed in pairs together with a circuit diagram.

Typical applications include all industries with damp atmosphere where corrosion affects normal fittings, applications such as fish tanks or any kind of tanks, greenhouses where water may be sprayed on this fitting quite safely as opposed to the conventional type. They may be used for outdoor lighting without fitting expensive waterproof covers and indeed anywhere where contact with dampness or actual water is likely or even possible.

These RENA waterproof Rubber Caps are available in two sizes; 38 mm. and 25 mm., and are distributed by Impelec Ltd., The Bury Farm, Pednor Road, Chesham, Bucks.

FRESHWATER SNAILS

by B. Fry

FRESHWATER snails were well thought of by pioneer aquarists of Victorian days. Indeed, away back in the latter half of the nineteenth century authoritative writers—and there were several of the highest standing such as the Reverend Gregory C. Bateman, Philip Henry Gosse and the amazingly versatile and prolific Shirley Hibberd—held that snails were valuable, if not necessary, for removing algal growths and keeping the bottom free of undesirable matter by eating it but also because their eggs and hatched-out progeny provided a natural food for fish. This belief persisted well into the 1930s. About this time, however, it began to dawn on aquarists that snails were neither very efficient as general scavengers nor as diligent as glass cleaners as old-time writers would have us believe. For one thing, it was observed that snails would only make a meal from a drowned earthworm or some dead *Daphnia* if nothing fresh and therefore better was available. And as for dealing with algae, it was clearly apparent that there were types of algae snails would never, or hardly ever, touch. Moreover, even the lower vegetable growths eaten by the molluscs had less appeal foodwise than the new shoots or delicate foliage of submerged plants. Thus the truth seeped through: snails in the aquarium contributed little or nothing to its well-being or sparkling appearance. In short, a dip tube removed mud and small debris and a razor blade fixed in a cleft stick peeled away algae from the glass faster and better than a snail's rasp-toothed tongue.

All the same, certain snails have their uses. Conspicuous for its decorative qualities is the red ramshorn (*Planorbis cornus* var. *rubra*), with mahogany-red shell, about 1 in. in diameter, and a coral-pink body. This snail does little damage to plants and a few specimens in an aquarium will make no noticeable difference to their appearance or growth. Much smaller in size is the white ramshorn (*P. albus*), a native species hard to come by (the red ramshorn is said to have come to us from Germany). Canals and rivers as far north as Yorkshire are sometimes inhabited by *Viviparus viviparus* (*Paludina vivipara*) that looks like a large mint humbug, or similar striped sweet, beautifully whorled and standing some 1½ in. tall. The coloration of the shell is greenish to greenish golden marked with three bands of red-

brown on each whorl. This prettily marked snail is, fortunately, no avid consumer of plant life. Years ago a snail sold by dealers who traded in a much wider variety of water life than they do today was called the yellow paludina. Its great attraction was its yellow coloration. Whether this splendid-looking snail was a distinct species or merely a colour variation of the type, I never discovered or even tried to find out. A few years before the outbreak of the Second World War two snails made their debut and became hugely popular. One a species of *Bullinus* from Australia was seen in almost every tropical fish tank. Even more in demand was the Malayan snail introduced under the technical name of *Melania tuberculata*. (It is now described in the books as *Thiara tuberculata*.) This snail, with a shell like a very elongated ice-cornet coloured olive green streaked and spotted with purplish brown, is a burrower. In point of fact it is rarely seen in the healthy aquarium unless the lights over the tank and in the room have been switched off for an hour or more. Then the aquarist can see it on the move by switching a light on again. It will be seen crawling on the glass and on the plants. *T. tuberculata* appears to eat little greenfood (apart from mossy algae). Seemingly it lives on what it finds (overlooked or unwanted fish food) in or on the compost. Hence the snail has great value as a grit cleaner. If *T. tuberculata* are seen clustering on the vegetation or walls of the aquarium during hours of strong natural or artificial light, then it is almost certain that the compost is polluted or there is a serious shortage of oxygen in the water or there are too great a number of snails in the tank.

For the benefit of those without much practical experience or book-learning, let me say at once that snails of the genera *Bullinus* and *Planorbis* deposit their eggs in clear jelly-like capsules (roughly oblong) on the sides of the tank, on the plants, on stones, plastic tubes and so forth. Snails of the genera *Viviparus* and *Thiara*, however, bring forth shelled young alive: active miniatures of the adults. As these baby snails make very rapid progress if the living is good a large number of them in a confined space soon becomes a problem fraught with danger, that is a danger to the oxygen content of the water and the health of the fish. The Malayan snail which keeps

out of sight when the tank is well-illuminated and has its young beneath the surface of the compost is a very special problem. As a rule, the aquarist has to keep this snail in check by handpicking after dark with the aid of a flashlight. Cichlids such as species of *Geophagus* also help to keep them down by their habit of sifting the compost in search of worms, crustaceans, molluscs and settled dried food. Strong-jawed fishes with a preference for aquatic larvae, and the like, such as paradise fish, bettas, combtails and puffers soon make short work of planorbis and Australian snails. Therefore, if the aquarist wishes to keep a few red ramshorn or red Australian snails in a decorative aquarium, then he must make certain that the fishes included in the set up do not delight in biting off their antennae or tearing them out of their shells.

The fact that some South American and Floridan snails grow to an abnormally large size, possess four horns and have interesting breeding habits (they lay their clusters of pinkish eggs above water level) gives them, for some aquarists, a peculiar fascination. These snails belong to the genus *Ampullaria* and are popularly known as apple snails. Most of them will rid a tank of its plants in next to no time. One species, however, called *A. cuprina*, is not too hard on plants. It prefers to live on cooked table greens, bruised lettuce leaves, algae, and biscuit crumbs. If a large jar housing a well-fed apple snail or two is kept comfortably warm, the water will soon become patchy with moving clouds of infusoria. It is easy, then, if you own an apple snail, to have a constant supply of microscopic live food for newly hatched fry.

FAIRY MOSS

by Phillip J. Brown

PLANTS belonging to the genus *Azolla* (*Azolla* is from the Greek and means killed by dryness) are often used, especially in ponds, as floating cover. They belong to their own family, the Azollaceae which is part of the Fern division (Pteridophyta) of the plant kingdom. Fertile plants are rarely found but bear mega or microsporocarps in the leaf axils on the undersurface of the plant. The two major species are *Azolla filiculoides* (Greater Fairy Moss) and *Azolla caroliniana* (Lesser Fairy Moss), the two being difficult to differentiate. Generally *A. filiculoides* branches more widely and loosely than the other species and protrudes somewhat crisply above the surface of the water.

They are both native to western N. America (though *A. filiculoides* was native to Europe until probably the last of the Ice Ages) but *A. filiculoides* was reintroduced to waters near Bordeaux, France by M. E. Roze (director of the Botanic Gardens) in 1880 and in Britain was recorded at Sunbury in 1910 (though it could have been on the Bure river as early as 1898).

To give an example of its vegetative spread *A. filiculoides* was discovered amongst Duckweed in mid-October 1913 in Jesus Ditch, Cambridge. By the end of November it had become dominant at one end of the ditch, and it was abundant everywhere by the following February.

This species is now widely naturalised in many midland and southern counties of England and it was first recorded in Wales in 1922. The spread is cut back somewhat in hard winters and regains ground in good summers or during floods (as it did throughout the Norfolk Broads in 1912).

Each leaf has two lobes, the upper floats and

processes chlorophyll and a symbiotic blue-green algae (*Anabaena azollae*) which fixes nitrogen. The lower leaf is submerged and colourless. Because of this nitrogen-fixing algae they are valued as manure in parts of the rice lands of Indo-China and are carefully propagated from year to year.

A handful of *Azolla* feels soft and spongy if picked up in the hand, and the long very thin, unbranched roots can be seen hanging down. The colour varies being especially reddish in sunlight, or strong artificial light, and turning brown towards the autumn. They do better out of doors than in the covered aquarium, though good lighting will help, and dislike temperatures much above 77°F. In the winter a resting period at about 65°F appears to help them survive. Sometimes *Azolla* will inexplicably disappear from a location, sometimes to appear a couple of years later, sometimes to disappear altogether.

The best specimens are produced in shallow trays over a peaty substrate, that are left out during the summer and brought indoors during the winter. Fructifications appear to be rare, especially so in the aquarium and reproduction is normally by rapid fragmentation.

Records for *Azolla caroliniana* are very uncertain in this country though it is found wild on the continent and is imported for the aquarium. Because of the confusion in identifying the two species, or rather telling them apart, older records are often doubtful.

Azolla pinnata (Ferny Azolla) from tropical Africa, Australia and Java is very occasionally imported for the aquarium and is always red-brown in colour with feathery roots. It is better suited for the tropical aquarium and will not last long in the pond.

A MIXED BAG

by H. G. B. Gilpin

EARLY this year some friends of mine presented me with examples of three intriguing species they had encountered living at a fairly high altitude in Majorca. These included two amphibians, a Green Toad, or as it is sometimes called Changeable Toad, *Bufo viridis*, a Laughing Frog, *Rana ridibunda*, and a Wall Gecko, *Tarentola mauritanica*.

Whilst by no means unfamiliar to me in the wild state, these were the first amphibians of their kind I had kept in confinement. On arrival both were placed in an unheated, glass sided, angle iron vivarium measuring thirty inches by eight inches by eight inches.

The floor of the vivarium is covered to a depth of two inches with a mixture of sand and loam and furnished with a large "rock" and a piece of old, gnarled tree bark. A vessel, some one inch deep and large enough to accommodate both Anurans at the same time, is set in the soil and filled almost to the top with water, so that no undue flooding occurs when the animals sit in it. Moss is arranged over most of the exposed soil but bare patches are left under and around the bark and "rock" to enable the creatures to bury themselves without difficulty whenever they feel the urge to do so. The vivarium is kept on top of a low bookcase in a shady corner of the living room.

Food is supplied in as large a variety as possible and includes slugs, up to three quarters of an inch in length, small earthworms, blowflies, maggots, spiders, woodlice and, when the other items are in short supply (earthworms were particularly scarce during the spell of hot, dry weather), mealworms. The hard-skinned mealworms are the least popular offering but are taken fairly readily as a last resort.

B. viridis is a handsome toad. My specimen, probably a female, is 7 cms. in overall length which suggests that it is immature, as fully grown members of this species reach 9 cms or even more from nose to vent.

Coloration in this species is somewhat variable. Mine is basically creamy brown on the dorsal surface, heavily marked with numerous, clearly defined and irregularly shaped dark brown patches. These patches tend to become green in a subdued light and the

ground colour also takes on a greenish tinge. The ventral area is greyish white. Many small, round warts are sprinkled over the back and the flatish parotid glands are bean shaped. The webs of the hind feet are comparatively poorly developed and the dark pupils of the protruberant eyes are circled by golden yellow rims.



Green Toad

Green toads make very satisfactory vivarium inmates. Judging from my specimen, they are phlegmatic animals, not given to dashing about their quarters, even when closely approached. Neither do they appear distressed when taken into the hand. Mine remains largely quiescent when held, merely emitting a series of muted, rather musical croaks as a mild protest against the indignity of such a close restriction. It spends much of its time in full view, crouched on the summit of the "rock," only occasionally seeking seclusion by burying itself beneath the soil.

Green Toads are said to swim and jump better than other toads. Mine, however, although it spends some time sitting in its water bowl, has given little indication of jumping ability. Spread over much of Eastern Europe, Green Toads inhabit both mountainous and coastal regions and are tolerant of brackish water. They hibernate during the winter, emerging in April to breed. The reproductive cycle is completed during August, after which both adults and the fully developed young settle into their winter retreats.

Laughing Frogs, also known as Marsh Frogs, again adapt well to life in confinement. They are attractive animals and, reaching a length of 15 cms. to 17 cms. are the largest European representatives of their order.



Laughing Frog

My Laughing Frog is still quite small, being no more than 6 cms. in total length. In spite of its modest size, the day after it came into my possession it deposited a clump of spawn, about the size of a half walnut shell, in the water vessel. Unfortunately most of the eggs carried white spots, indicating infertility.

This animal is most appealing and bears some resemblance to the Edible Frog, *Rana esculenta*. Its muzzle is rather pointed and the tympanic membranes prominent. The bright green back is ornamented with well spaced, irregularly edged brown patches. Two light brown bands pass from the nostrils, through the eyes, to the posterior end of the body and broad cream bands extend along the upper jaws below the

eyes and tympanic membranes, changing to green in front of the eyes. The sides are brownish cream, marbled with dark brown and the legs brownish green decorated with brown patches. The underside of the body is cream and the dark pupils of the eyes are rimmed with brownish gold.

R. ridibunda is easier to maintain than most frogs in confinement as far as my own experience goes, largely because it does not leap frantically from one end of the vivarium to the other when disturbed and consequently does not damage itself by crashing against the glass, a hazard sometimes encountered with captive frogs. Its placid disposition (for a frog), makes it easy to catch when needed for close examination. Much of its time is spent buried in the soil beneath the bark but it is frequently seen sitting solemnly in the water vessel completely indifferent to movement outside the vivarium.

The Laughing Frog is an East European species but has survived its introduction to the Romney Marsh area in Kent in 1933. Usually found in large stretches of water, its breeding season extends from April to July.

The Wall or Moorish Gecko, current member of the considerable number of these animals I have kept, at 9 cms. long is not yet fully grown. It is a light coloured individual and more nervous than most I have encountered, spending most of its time hidden from view on the far side of the horizontal log resting on the dry sand covered floor of its quarters. After some weeks in my possession it deposited three oval, pure white eggs, each .8 cms. long, one on the visible side of the log and two on the sand. I have bred *T. mauritanica* on a number of occasions but have small hope of a successful hatching from these particular eggs.

PROTECTION SYSTEMS FOR THERMOSTATS

(continued from page 273)

For those people who have tanks in a very cold environment, such as an unheated garden shed in winter, and who therefore fear the thermostat failing to switch on rather than the reverse, fig. 2 takes care of their problem. With this arrangement *a* is set to 78 and *b* to 74. Thermostat *a* again does the switching whilst *b* remains open on standby.

Anyone wishing to protect against both kinds of failure may do so by employing the circuit shown in fig. 3. This uses three thermostats and works in the following manner. Normal switching is carried out by thermostat *a* which is set at 78. If these contacts fail to OPEN the temperature of the tank will rise to around 82, when thermostat *c* comes into operation and the tank is then maintained at around this temperature. If, on the other hand the contacts of *a* fail to CLOSE, the water temperature will fall to

around 74 and *b* will take control. Thus if the aquarist notices that his thermometer reads in the low seventies or in the low eighties, instead of the high seventies, he will know that thermostat *a* has ceased to function and he should replace it as soon as possible. In either event, no great harm will have come to his fish.

I have a biggish tank containing two large Tinfoil Barbs, old friends of mine, and they are protected by this last system; it was expensive to install but worth every penny for the peace of mind. I have used three Slick Stats clipped onto the bank of the tank. Immersion-type thermostats could have been used but they are less convenient to set. I must say that to date I have had no trouble of any kind with my thermostats but if anything does go wrong, my Tinfoils will not suffer!



OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries MUST be accompanied by a stamped addressed envelope.

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

TROPICAL QUERIES

by Jack Hems

Please give me the scientific name and country of origin of the porthole catfish?

The porthole catfish is known to science as *Dianema longibarbis*. As far as I know, it ranges in the natural state over a fairly wide area of South America.

I would like a tank of smallish barbs alone. I would not wish to include any of the avid plant eaters because I think that plenty of plants helps to make an aquarium more decorative. Have you any suggestions?

You could hardly do better than pick your barbs from the following species: *Barbus oligolepis*, *B. titteya*, *B. cummingsi*, *B. semifasciatus*, *B. lineatus*, *B. ticto*, *B. puckerli*, and the lovely sport or coloured variation of *B. sachsii* or *B. semifasciatus* popularly known as Schubert's barb, so named because it is believed to have been developed by the late Tom Schubert, of Camden, New Jersey.

Could you advise me how to 'cure' some artificial rocks I have made for my aquarium? I used a 2:2:1 mixture of granulated peat, sharp sand and cement.

First, I am not at all certain whether your rocks will stand up to prolonged soaking under water. Peat as an additive is quite likely to make them crumble away. A mixture of peat, sand and cement is known to some growers of alpine plants. It makes splendid troughs which attract mosses and lichens. However, in a severe winter or very dry summer the surface tends to flake away. To 'cure' artificial rocks, however, it is necessary to soak them in several changes of water and take frequent pH tests. When the water remains neutral (pH 7.0) or inclines to acidity, then the rocks are safe to introduce into the aquarium.

My aquarium fish are swimming at the

surface as though suffering from oxygen depletion, yet the tank is well-aerated, not overcrowded or polluted by uneaten fish food or spent vegetation. The gill-covers of the fish are open and look raw. All food is refused. What is wrong?

In all probability your fish are suffering from an attack by gill flukes. Hurry along to a specialist tropical fish dealer and tell him about the behaviour and appearance of your fish. He will no doubt have just the drug to help combat the disease.

I have tried a variety of plants in my 2 ft. tank but the only species that stays alive is the fern called *Microsorium pteropus*. Yet even this durable fern has lost many of its large green leaves. I am using a 15-watt fluorescent lighting unit and the water is soft and acid. Where do you think I am going wrong?

Probably in the strength and duration of the artificial light. Try using a 20-watt lamp and keep this switched on for at least 14 hours a day.

Is it safe to use a fly spray in a room in which tropical fishes are kept?

Not unless narrow wads of wet paper are placed end to end between the glass cover and the top of the tank to make a complete seal. And one more word of advice. Do not forget to switch off the air pump while the fly spray is being used.

I wonder whether you could supply me with some elementary advice? I have never kept fish before and would like to know the best size of tank to start with. Secondly, what sort of lighting would I require? Thirdly, could you give me the names of suitable plants and fishes to stock the tank?

Buy a tank approximately 3 ft. long. Equip it

with a 30-watt warm white fluorescent lamp housed in a reflector hood. Place the hood on a glass cover placed about a couple of inches above the surface of the water. Keep the light switched on for about 14 hours a day. Stock the tank with about 21 small and peaceful fishes such as neon tetras, black neon tetras, platinum tetras, lemon tetras, harlequin fish, Schubert's barb, platies and, say, *Corydoras* catfish. Anchor the roots of plants such as *Vallisneria spiralis*, *Cryptocoryne affinis*, *Hygrophila polysperma*, *Microsorium pteropus* and *Sagittaria subulata* in about 2½ inches of well-washed non-calcareous grit or sharp sand.

I appear to have millions of snails in my aquarium and a friend has suggested that I introduce a young terrapin to clear them out. What do you think of this idea?

I am sorry to say it is not a sensible one. The terrapin will soon grow (if it is healthy when purchased) in a tropical aquarium and it will not confine its attentions to the snails alone. Sooner or later it will make snaps at passing fishes and the smaller ones (if you have any) will lose their heads, tails or vanish completely. Larger fish will show missing scales and split fins. One way of dealing with snails is to remove every large snail you see and keep this up for a few weeks. The baby snails you find on the glass may be squashed against the sides and allowed to sink to the bottom. They will be eaten by the fish. There is a snail killer on the market which kills snails without any adverse effects on plants or fish.

I am about to use the following materials to construct a fish tank: four pieces of outdoor quality plywood for the back, base and ends and a sheet of float glass let into grooves in the wood along the front. Do you think polyurethane varnish would make a suitable waterproofing agent for the inside wood surfaces and would the usual putty-based cement be suitable for holding the glass in place?

Forget polyurethane varnish except for the exterior of a stained finish. Use two coats of an epoxy resin varnish for the interior of the tank. A silicone rubber aquarium sealant is recommended for fixing the glass. Give the finished tank a good soaking in one of two changes of water before introducing fish.

I have a catfish which my dealer informed me is known to science as *Synodontis schall*. I would like to know the length this fish may attain, its range in the natural state, and its suitability as a community fish?

S. schall reaches about 14 in. and, as far as I know,

is quite common over the northern half of Africa. A small specimen would not raise any problems in a fairly spacious community tank stocked with sturdily built fishes of about its own size. Full-grown *S. schall* however, are not suited to sharing quarters with fishes like neon tetras or platies. In short, they must be housed by themselves or with fishes too large to be looked upon as prey.

The tapwater where I live is rather hard and alkaline and my chief interest is in fishes that thrive best in soft and acid conditions. At present, I keep the bottom of my aquarium clean with the aid of an efficient under-gravel filter. Lately, however, I have been wondering whether it would be an advantage to add a peat filter to my set up; for I have been told that peat reduces the pH level of the water and absorbs some of the alkaline salts. I would appreciate your comments on this matter.

A Slim-Jim type filter (inside or outside fitting) filled with a good imported German peat or a first-class moss peat with a brand name, topped with a layer of filter fibre would certainly be an advantage. Operated for several hours every day it would reduce the pH value of the water very gradually and, at the same time, probably result in a noticeable softening of the water.

I wish to prevent glitter from the back ends and base of my aquarium which has neither gravel nor plants in it. Do you think a good enamel paint would provide a solution?

There may come a day when you would like to remove the paint from your aquarium, so steer clear of an enamel paint. Use poster paint (on the outside surfaces, of course) or tinted paper obtainable from a shop that sells artists' materials. You can get papers in lovely shades of grey, green, ochre, and so on. Even black. The paper can be stuck to the outside of the glass with a mere touch of a good adhesive at the corners. Do bear in mind that most fishes become very unhappy and scary in a bare tank, so I suggest that you introduce some well-scrubbed pieces of coal, granite or slate to provide shade and shelter.

When I switched on the light the other evening, I noticed my female guppy dead at the surface. There were no signs of injury on her body. Her mouth was wide open. Can you tell me what caused her death? All the other fishes in the tank are healthy.

The guppy is not a long-lived fish and a female after producing several batches of young sometimes dies without any visible warning. Then again, guppies are sometimes placed with other fishes that bully them, and continual bullying soon leads to

death. A fish can die, too, by choking itself on a piece of food too large to swallow. You did not mention how many weeks or months the fish had been in your possession. To return to longevity, the

life-span of a guppy is about eighteen months to two years. Guppies that exceed this life-span are exceptional.

COLDWATER QUERIES

by Arthur Boarder

I have had two black goldfish in my pond for at least eight years and they have now changed to gold. Is this unusual?

It is unusual for goldfish to change colour after so long, but of course the very hot summer has encouraged this change. If there had been as much sunshine in earlier years they might have changed before this. However, it may not be so unusual when one considers that most pondkeepers would have removed the dark fish from the pond some years ago, but it just shows that even after a number of years it is possible for such fish to become gold. I would not advise keeping such fish for breeding as they could pass on to their progeny the tendency to remain uncoloured for a long time.

Can you tell me where I can get some good fancy goldfish? I wrote to a specialist society and asked for information about this but I was told that unless I joined the society no information would be given.

I am enclosing the information which you seek; I am not surprised that you had such a brusque reply to your letter. I know the society you wrote to and can understand their narrow-minded attitude. I think that if you had received a friendly helpful letter you would have been more inclined to join, the society, which you had refused to do. I suppose that we should not really be surprised as there is a modern tendency about for discourtesy these days. Even our own post office tells us that unless we add another two pence stamp to our letters they will not be delivered immediately but be deliberately withheld for a couple of days or so. This unless attitude always suggests to me a veiled threat.

Owing to the ever-increasing cost of electricity, I have decided to give up keeping tropicals which I have been doing for a number of years. What do you recommend that I should keep instead in the form of coldwater fishes please?

There are many types of fishes which you can keep without using any electricity. No aerators nor filtration is necessary to enable you to keep and breed many types of fishes. You will, no doubt, be able to prevent the tanks from freezing during the winter.

Apart from small fishes such as Medakas and Bitterling, you can keep and breed many varieties of fancy goldfish. Apart from these there are several kinds of tropicals which will live happily in unheated water provided that they are gradually acclimatised to a lower temperature. White Clouds and some of the Platies will do well as will the paradise fish, *Macropodus opercularis*. You will find that the fishes which you usually keep at a tropical temperature will not only live in cooler water but will also breed during the summer months. Another bonus is that they will eat less and live much longer. I have had Paradise fish live in water as low as 40°F, and also *Platy variatus*. Many other tropicals could be kept at a lower temperature if their owners would take the chance of gradually lowering the water temperature.

I had a garden pond in very good condition and when I stocked it with Rudd and Orfe, the fish crowded together in one corner of the pond, pushing about and over each other for some time. They did not show any interest in food. What was the reason for this strange behaviour?

Nothing strange about the actions of the fishes, they were just spawning and this is the usual method. They chase and nudge very vigorously and no harm should come to the fish unless there are too many strong male fish in proportion to the number of ripe females.

Six months ago I bought a two inch Koi. It has grown to about eight inches long and is getting too big for its tank. What size pond do you recommend for keeping and breeding Koi in?

The larger the pond the better for these fast growing fish. For your garden I suggest that one about ten feet by eight feet and two feet deep would be very useful. It will also be an advantage if you can construct a shallow part somewhere as the fish will prefer to spawn in such shallow water. You state that you have been keeping your fish in a temperature of 72°F. This is unnecessary and you will have to gradually lower this temperature before placing the fish in an outdoor pond. This will depend of course on the temperature of the pond water. A variation

of a few degrees will make no difference to the fish, but one should never put a fish direct into water ten or more degrees F lower than that from which it came. Switch your heater off at night and do not use it again for the Koi.

I recently lost two Koi from my pond but the other fishes, goldfish and Orfe appear to be quite healthy. The Koi had an inflammation around their gills and I wonder if the trouble had been gill-flukes. What do you think?

It is always difficult to diagnose the trouble which has caused the death of a fish. One would hardly expect a doctor to be able to do the same when told of the death of an unknown patient by letter. There are several troubles which could affect the gills of a fish and the flukes seem to be one of the more common. However, I have not found that *Gyrodactylus* attack largish fish but usually are found on young fishes of about two months of age. Flukes are not, as a rule, pests which cause a quick death but there is usually a lapse of several days before a fish succumbs to the trouble. The usual signs of distress in an affected fish are that it goes off its food, the fins fold up and the fish becomes very sluggish and mouths at the surface of the water. Then after a few days, blood streaks will appear on the body of the fish and death may take place within a couple more days. The trouble can be noticed early when the fish is in a tank, but when in a pond, it may be some time before the above signs are noticed when it may be too late to effect a cure. When treating young fancy goldfish for the pests it has been found that a short immersion in a solution of a quarter teaspoonful of Dettol to a half gallon of water is a good cure. When treating a fish it is important to keep the fish in a net so that it can be removed immediately to fresh water if it turns over. Just a few seconds are usually sufficient to kill the flukes. When a fish is so treated it should not be returned to the pond at once, but kept under observation for a second treatment if necessary.

I have purchased a garden pond, 50 x 42 x 12 inches. What plants shall I use and will goldfish keep the water clean?

Your pool is very small and so will be very difficult to manage throughout the year. There will be so little water that it will be subject to extremes of temperature and in a bad winter could freeze up very thickly. It will get quite hot in the summer and so you will only have to introduce a few small common goldfish. As for plants, you can use a couple of under-water oxygenating plants such as: *Lagarosiphon major* and *Ceratophyllum demersum*. The pool is not large enough for a water lily, even one of the *Nymphaea* types. You will be well advised to treat yourself to a larger pond and use the old one for breeding *Daphnia*.

I have a tank 24 x 12 x 12 inches in which I have two Golden Orfe, two red-cap orandas and five small goldfish. The temperature of the water is kept at about 72 F. One of the orandas scraped its side on a rock and now the goldfish peck at this spot. What should be done about this please?

Remove the injured fish so that it is not worried by the other fish and keep it in a separate tank under observation. You can dab the wound with T.C.P., neat, whilst holding it carefully in a wet cloth. You may find trouble with your Orfe, as they are essentially coldwater river fish and do not like a warm temperature. Also they are such fast growing fish that they require plenty of swimming space if they are to thrive. Unless you have some aeration in the tank the orfe may be in trouble through lack of oxygen.

I have a fibre glass pool about, 7ft. 7 in. x 6 ft. 9 in. x 18 in. deep. In it I have three golden orfe; two green tench; a pair of comets; a pair of shubunkins and a pair of goldfish. I have two water lilies, plenty of oxygenating plants; water mint; brook lime; parrots feather; marsh marigold and water forget-me-not. I have also added two Koi. Some of the goldfish have now a few sores on their bodies and I think that they were injured when I bought them. What is the best thing to do with them?

It may be that the fish had a form of Ulcer disease when you bought them. There appears to be an infection which is appearing in some imported fishes. This may be difficult to cure as it appears to be an internal infection and may only be cured by feeding with food treated with antibiotics. A Vet., might be the only one who could supply these and suggest the proper dosage. I think that you have overstocked your pond, both with plants and fishes. Many of the plants you are using have little value in a pond as they are not oxygenators and can only tend to use up waste matter in the pond. I do not think that Orfe and Koi are suitable for your pond, as it is too small. Both of these fishes grow fairly fast and require plenty of swimming space if they are to thrive. The amount of stock you have, in plants and fishes would be quite sufficient for a pond twice the size of yours. You can try dabbing the wounds on the fish with T.C.P. or Dettol, once a day for a week to see if there is any improvement.

I have a 24 x 12 x 12 inch tank well planted with oxygenating plants and stocked with a variety of coldwater fishes. I have plenty of gravel on the bottom but the plants will not grow. I have a 30 Watt strip light on for about fourteen hours a day but the plants neither die nor grow. Can you explain this please?

I use an ordinary 40 watt filament bulb on a tank and it is on for approximately ten hours a day. The plants grow well, never have to be renewed and often have to be pruned. The plants are the survivors of plants I stocked some tanks with thirty years ago. I suggest that you change the lighting to an ordinary bulb and see if it makes any improvement.

I would like to set up a fair sized tank for fancy goldfish and wonder if it is essential to provide an aerator and a filter to the tank?

Provided you do not intend to try to keep too many fishes in your tank there is no need at all to use either an aerator nor a filter. I have kept fancy goldfish in tanks for very many years and have never used an aerator nor filter in any of my stock tanks. A well balanced tank will operate for many years as long as the golden rule of an inch of body length of fish to each 24 square inches of surface area is not exceeded. Just a weekly servicing is all that is necessary to keep a tank in good order. If one finds it necessary to install an aerator or filter it is a sure sign that conditions in the tank are not correct, either that too many fishes are being kept or too much food is being given. It is as easy as that. It is possible for an experienced aquarist to keep more than the allotted number of fishes in a tank but they would not grow nearly as well as if they had more swimming space. It is possible to restrict the growth of goldfish considerably by not providing plenty of space, but one has to know how to feed and to keep a constant eye on the condition of the fishes.

We have recently moved into a house which has a goldfish pond in the garden. There are a couple of fair sized fish in the pond but the water is getting dirty. What can be done about this?

There may not be enough under-water oxygenating plants in the pond or you may have been over-feeding the fish. If the water is turning green, then it is a sign that too much sunlight is reaching the water. Much can be shaded out by water lily leaves or duckweed on the surface. Plenty of oxygenating plants also tend to choke out the Algae which is the cause of the water turning green.

I am sixteen and a keen tropical aquarist. I now wish to take up breeding coldwater fishes. How many tanks and what size shall I need and which variety of fancy goldfish do you recommend me to start with?

I suggest that you start with a good strain of fantail goldfish. Just start with the one variety only. It is impossible to say how many tanks you will need when very small the fry can be crowded somewhat but to grow them on one needs plenty of space. A 24 x 12 x 12 in. tank will hold three dozen fry up to a month old, but after that they require more space and only twelve young fish would thrive in such a tank when over an inch long over-all. However, it is possible to utilise several types of container without going to the expense of proper tanks. Old coldwater cisterns can be adapted for use and plastic washing-up bowls make very good hatching containers.

WHAT IS YOUR OPINION?

continued from page 272

short time of recovery they feed. It seems, therefore, that no distress is caused to the fish. If they are left in the solution for any time after they turn over they soon die. It has occurred to me that this may be a good way of painlessly destroying ailing fish." (Mr. Richards' letter contains some interesting suggestions and opinions. I'd be pleased to hear from anyone else who has used phenoxetol at such high dosages; and from anyone who may attempt to use it as a drug with which to terminate the life of an incurable fish. Please remember, readers who use manufacturers' remedies at doses higher than those recommended by the manufacturers do so at their own risk. I accept no responsibility for the views expressed by contributors to this feature. Having said that, I shall certainly try Mr. Richards' treatment on ailing fish that may not respond to recommended dosages with branded 'cures'.)

Please send me your opinions on any of the points raised in the body of the text; and on the following: the best types of grass-like aquatics for tropical and for coldwater aquaria; breeding glowlights; suitable kitchen foods for feeding to fishes. Are regular, partial water changes really necessary in the case of an 'average' community aquarium that is not over-stocked? Many textbooks tend to dismiss dried foods as inferior substitutes for fresh, live foods. Do you agree with this view? What proportion of the diet of your fishes consists of dried foods and do you consider the best dried foods to be worse than, as good as or better than live or fresh foods? Do you supply extra food to your aquarium plants? If so, what and how? Please send me your opinions on the use of peat and/or clay under the gravel in an aquarium. I look forward to receiving a letter from you.

From a Naturalist's Notebook

by Eric Hardy

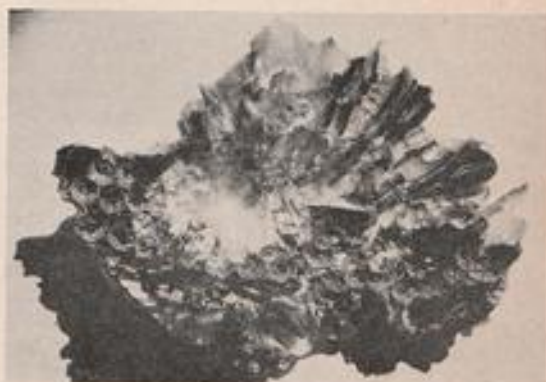
ALGAL blooms of phytoplankton, microscopic plants, cause the pea-soup appearance after summer heat-waves, not only in eutrophic lakes like the north Shropshire meres, but in our inshore waters. They are linked with phosphates and phosphorus in industrial and sewage pollution. An American term for one species is "red tide". The sudden death of these single-celled whip-tailed plants in the autumn may kill aquatic life with the bacterial poisons produced. They also secrete toxins.

Propelled by 2 flagellae or whips, these with the hard or soft skins are sometimes a help in the difficulties of identification. *Gyrodinium* is a genus of unarmed dinoflagellates with the girdle (one of the two grooves which harbour the beating flagellae) not in the more usual encircling position, but displaced on the ventral side, descending in a spiral to the left, with a trailing flagella. One of these, *G. aureolum* first discovered off Eastern U.S.A. in 1957, and Norway 1966, was first found causing a bloom in British waters off North Wales in 1971. Here milder densities reached 920,000 cells per litre. Even then it caused the deaths of lugworms. In 1975 it was found in Liverpool Bay and Morecambe Bay. It has also been found off Plymouth, and probably occurs off Jutland and Heligoland, sometimes associated with fish deaths.

I have previously mentioned recent introductions of the large Japanese or Pacific oyster, *gigas* into British waters, like the Menai Straits (from Conway tanks), Poole Harbour, River Roach, Walton Channel, Helford River, etc. Experiments also being made to raise it in marsh pond at Cockers Dyke in south Morecambe Bay have shown growth is possible in the extensive saltings behind the flat sandy coasts of Lancashire and Cheshire. One of the largest oysters in the world, it can grow more than a foot long in warmer waters, though spawned in tanks here; it probably will not spawn every year in colder northern waters, so 'seed' would have to be imported. It survived the summer and winter range of salinity and temperature in Morecambe Bay.

The influence on the ecosystem of this giant Pacific rock-oyster with a typically fluted shell-edge isn't yet clear; but its spread in SE Australia brought fears that it could bring new pests and diseases to native oysters, or compete adversely for their food. In 1974

it was banned in New Zealand; but elongated Portuguese blue-point oysters have long been introduced to British coasts without harm. Australia, of course, is



Showing its typically fluted shell-edges, Britain's new mollusc, the Japanese or Pacific oyster, *Grassostrea gigas*.

wary of introducing any more aliens for the rabbit isn't its only mistake. Common carp have become established in Canberra's Lake Burley Griffin, where 15,000 native silver perch were introduced last year to feed on young carp and, with competing rainbow trout introduced this year, should control their numbers. Biologists have used the big Japanese oyster's larvae to assay contamination by subjecting them in tanks to additions of suspect water, which affects their growth.

I wrote the other year about the last 200 Devils Hole pupfish adapted to isolation in their stony prison near Death Valley, near Las Vegas, for at least 20,000 years. The U.S. Supreme Court ruled this summer that irrigation water cannot be drawn off the limestone cavern of these inch-long algae-feeding fish. The hole was designated a reserve for the rare pupfish in 1952, but a local firm began pumping in 1968. *Cyprinodon diabolis*, to name it, spawns on a ledge just below the surface. If water drops below this level, the fish cannot reach their algal food.

However welcome, this was probably a more costly decision than even the £20 fines on charges of assault

and harm imposed by a Durham court, in August, on a conservationist who was alleged to have tussled with two women collecting toad-spawn from a pond he was restocking. Chester Magistrates Court discharged absolutely two anglers who in August had pleaded guilty to stealing 5 water-lilies from an ornamental pond in nearby Tilston. The discharge was made after the magistrates told them to consider changing their plea to not guilty.

It is surprising, however, in these days of conservation propaganda, that scientists should be in trouble for conserving rare aquatic life without official permission. Is that what bureaucracy is coming to?

I was one of the invited speakers at a "summit" meeting at Ainsdale Southport, in August, of London members of the British Herpetological Society, Lancashire and local naturalists, northern officials of the Nature Conservancy Council, local authorities, etc., to settle the natterjack toad and sand-lizard conservation controversy on the local dunes. Southport Borough solicitor stated that they probably wouldn't have objected to the B.H.S. party (including two Ph.D's) digging a waterhole on the drying Birkdale dunes to save natterjacks desperately short of water, if permission had been asked first. The 26 other participants seemed only to agree that we disagreed. The discussion soon developed a haemorrhage in the clash of personalities; but fortunately nobody came to blows! The Nature Conservancy and the Lancashire Naturalists' Trust came in for heavy criticism. Though N.C.C. plans 3 new excavations these were criticised for all being in the same slack basin, and for a lack of urgency when pools were required before next spring over a wider area. So little was known of the sand-lizard that a 3-year research is to be initiated. Of 72 wet sites on the dunes last year, 35 contained natterjacks and 25 were successful. Some natterjacks bred in local garden pools. A former warden stated that no accurate natural history survey or habitat map had been made of the dunes, of which the Nature Conservancy owns a large area south of Ainsdale Shore Road and Southport Corporation the area north of it. Dr. Beebe, of B.H.S., claimed that numerous conservation meetings were filled with platitudes yet nothing was done. Only 1% of the former water was now left on these dunes and the natterjacks' reproduction capabilities are at a minimum. Manchester University's project here reported a further decline in sand-lizards since the 1974 survey.

Efforts to form a watching committee to manage conservation fell through, because the Nature Conservancy could not see their way to join, or send a liaison member; but they agreed to join a party later that month to inspect prospective sites for excavating pools at Ainsdale-Birkdale dunes. The meeting revealed a deplorable clash of personalities, rivalries between

Ph.D.s researching here, and a lack of liaison, confidence and unity from the county trust down to local field-workers who seem to be divided into numerous cliques and "closed shops". Meanwhile, the dunes suffer increasing public pressure, trespassing motorcyclists and horseriders, and a constantly falling water-table.

The explosion of the Ainsdale natterjack row into press and TV has, unfortunately, given the public the impression that it is the only haunt of natterjacks in Britain. As well as breeding over 24 kms of the old south Lancashire (now north Merseyside) dunes from Hightown to Birkdale, they have small colonies at Cockerham in the Fylde, in Cumbria at Ravenglass and Solway (formerly at Beck Heads Woodland Fen, old Lake Lancashire) and in Cheshire on West Kirby—Red Rocks shore-marsh of the Dee estuary. On the East Coast they breed at Saltfleet Haven dune-slacks north of Saltfleet-by-Theddlethope in Lincolnshire, and King's Lynn Levels on the Cambridge-Norfolk border. Their main southern haunt is Frensham Ponds, with a few old specimens at Hampshire's Wolmer Pond and some other pine and heather Home Counties and Sussex haunts. Extinct at their former North Wales haunts at the Clwyd Estuary and on the Conwy to Llanwrst, they linger in Ireland south of Castlemaine Bay in Kerry and at Roscrea (Tipperary). Sand-lizards of course are also at Devil's Ditch, Newmarket, and Studley in Dorset.

The lack of liaison in research and incomplete literature on the natterjack in Lancashire are deplorable. Before the war, I found a small breeding colony in sewers in north Liverpool, a relic of the ancient city colony in the old brook now marked by Whitechapel. A friend mapped their pre-war winter hibernation sites on the dunes. Some years ago we got a complaint for rechecking these to see how many were still used, due to an over officious official. There have been experimental introductions of the montane palmate newt, which inhabits waters in the Pennine region to the east, near Accrington and Blackburn. Crested newts have also been experimentally introduced. Natterjacks and sand-lizards are found south of the Alt, despite statements to the contrary. In 1970, the Conservancy admitted accidentally wiping out a colony of sand-lizards on their Ainsdale reserve when bulldozing a reserve road. A few years later, one of the voluntary wardens resigned because a reed-cutting machine used on the reserve killed off a breeding colony of natterjacks. The falling water-table was denied when we first warned of it.

In more permanent waters, like canals, the long, hot summer again showed plenty of the small pale flowers of *Elodea canadensis* borne on threadlike stalks from this submerged water-weed, arrowhead flowering and seeding freely and lesser bladderwort flowering wonderfully.

BREEDING LIVEBEARERS TO COVER EXPENSES

by A. Jenno

THE common livebearing aquarium fishes—guppies, platies, swordtails and mollies—reproduce so freely that they are an ideal subject for the experienced aquarist who wishes to offset expenses or even make a small income from his efforts in the hobby. Some of the rarer and more sought-after varieties of the above species can command really worthwhile prices if carefully bred for quality, colour and size.

Most of the livebearers sold in this country are imported from abroad and will almost certainly not have been born or grown up in aquaria as the hobbyist understands the term, and will usually not have been properly acclimatised to living in small transparent-sided containers, frequently without any base covering. These fishes are therefore obtained here in an upset condition, as a result of the unfamiliar surroundings they find themselves in, the rigours of transportation and handling, and the overcrowding and poor feeding which they experience whilst working their way through the commercial system. This state manifests itself as extreme nervousness, poor physical condition, and a tendency towards disease infection if this is not already present. No competent aquarist would dream of introducing such fishes into an existing established aquarium without a thorough quarantine period in a separate isolated container, and those with experience will not be surprised when a proportion are lost before there is time to correct their condition. Dealers who quarantine and acclimatise the inexpensive fishes before sale are rare, so the aquarist must expect to do this personally in every case.

This state of affairs then opens a door for the fish-breeder who can produce stock of good size in top condition, and in the regular quantities demanded by a commercial arrangement. The main essentials with respect to livebearers are that they should be healthy representative specimens, naturally, but also sexable and having most of their adult coloration. This point in their growth develops at about twelve to fifteen weeks of age, and if the fishes have been properly fed and kept in suitable environments there should also be good body size and fin development at this stage. Home-bred livebearers, produced efficiently, should command a ready market and a

conscientious breeder ought not to have difficulty in disposing of his fishes by a mutually-agreeable arrangement with his local dealer.

The main causes of mismanagement of livebearer breeding programmes are the incorrect selection of breeding stock, poor feeding, and bad aquarium hygiene.

Livebearers bred for sale will not usually require a highly complex selective breeding schedule; line-breeding, and particularly close in-breeding, should not be needed or in fact desired whilst the object is to produce from standard, already well-established strains and colour varieties. The complicated exercises which develop the best show fishes and fix new strains are not necessary here. The aim is to promote health and growth, coupled with vitality and a recognised appearance. Breeding stock should therefore be unrelated, with fresh blood being brought in for every generation. Female livebearers are very poor travellers and are more susceptible to interference and handling than are males, in general, so it is best to use home-produced females whenever possible once the breeding system is established, and to bring in good males from elsewhere for each successive generation. Membership of livebearer-orientated societies or associations will facilitate this. It should not need stating that breeding stock and selected prospective breeders must be kept in the very best conditions and have every effort made to ensure their health and reproductive potential.

Diet plays an important part in the well-being of fishes removed from their natural habitats into captivity. Livebearers eat almost anything, but have a tendency towards vegetarianism which many aquarists fail to appreciate or cater for. Soft green algae is an important item in their diet, but in aquaria it is unlikely to be present in quantity so other green foods such as peas and spinach are useful. Live foods can provide benefits which prepared dead material lacks. *Daphnia* and *Tubifex* are the traditional stand-bys and have good dietary properties, but are difficult in use because their condition is not easy to determine or maintain and can result, especially with *Tubifex*, in various mysterious troubles or outright bad health. Being of aquatic origin, they cannot be effectively

separated from other water-borne organisms which live with them in the wild and which can have effects on fish life, for instance parasitism and disease transport. Other live non-aquatic foods such as the cultured worms—micro, grindal and whiteworm—are much more suitable and are also capable of being home-produced. For fry, the Brine Shrimp nauplii reign supreme and a proper hatchery for these is a necessity.

Quantities of vigorous, growing fishes have appetites which preclude the use of relatively expensive hobbyists' fish foods. A staple bulk food needs to be found which will provide the necessary feeding requirements but is obtainable in quantity cheaply and does not pollute the aquaria when fed fairly heavily. Trout fry pellets, as developed for commercial fish-farming, suit admirably. They have a high protein content and contain other beneficial ingredients, and are of a convenient size for use with small fishes. Further vital items of diet are the vitamins which can be supplied by boiled liver minced to a convenient size, and by the addition to the aquarium water of vitamin tablets directly for assimilation by absorption. A feeding schedule might comprise, for instance, the staple food together with liver, peas and white-worm and would not need variation once its effects were proven.

Water hygiene is of the utmost importance, and particularly so in crowded rearing aquaria. Over-feeding is the prime cause of bad water conditions and nothing will help the aquarist who allows this to happen. The fishes' waste products can be handled adequately by biological filters and regular proportional water-changing in the order of ten to twenty per cent per week if feeding is correct. The biological filters should be installed so that one end of the aquarium base is left bare and all food given should be put in over this area. A weekly siphoning will then clear any uneaten excess (which should be minimal) and general sediment without these materials finding their way into the voids in the filter beds to create blockages and loss of function. The bare-base feeding area also allows the inclusion of sinking foods in sensible quantity to cater for long periods when the aquarist is not available to feed the fishes frequently.

After a batch of young fishes has been grown up in a particular aquarium and disposed of, there is a good opportunity at that point to change all of the water. During this operation the gravel filter bed can be thoroughly stirred to flush away any entrapped mulm and debris with the old water. On refilling, the aquarium will be in good condition ready for the next batch of fishes and the filter should work at best efficiency without requiring a maturation period. Biological filters and livebearing fishes are complementary in that they both prefer alkaline water conditions. Soft, acid water does not easily support

the massed bacterial life essential to the filter's operation and all of the common livebearers are happier when the water has an appreciable mineral content.

The actual breeding of this group of fishes is so easy and, indeed, automatic in suitable conditions, that there is not much to be said about it. The females will tend to be permanently pregnant in the presence of male fishes and can drop up to about two hundred fry at more or less monthly intervals. The parents will often eat the young at birth if they can do so without too much trouble, but once the fry are swimming about properly then only hungry or unusually greedy individuals will bother them. Nevertheless, in any system requiring maximum regular production it would be unwise not to provide for the protection of the fry. Breeding traps are not clever because they are always too small and thus frighten the gravid female at just the time when she particularly needs to be in a settled state, and any movement of the female to a trap or to another aquarium to give birth inevitably induces complications such as still-born fry or their abortive absorption by the female. The best protective method is to simply screen off the major part of the aquarium in which the adults are living and to provide plenty of plant growth in the smaller section containing them. The newly-born fry then have a good chance of survival by achieving shelter through the mesh in the larger safe area of the aquarium. This system works well and is reliably productive. It also has the advantage that the fry can be left in their section of the aquarium and can be fed there until they "find their feet." A period of about two weeks seems beneficial and during this time they should be given as many baby Brine Shrimp as they will eat (without overfeeding of course), as they will utilise this food more efficiently while it is held in a compact swarm in this small water volume.

Following the move to a larger rearing aquarium, the fry will need settling as quickly as possible. This is not the time to change their food or environmental conditions such as temperature or water characteristics. They have enough to do in adapting to their new surroundings and getting over the shock of being netted and moved. Any growth lost through unsettling influences is very difficult to restore later, so these are important points. Once settled in the new aquarium, however, the young fishes should benefit from the larger water volume and more stable conditions inherent in large containers. There is no need for such rearing aquaria to be very deep; nine inches of water over the filter bed depth is generally adequate, and such large-area, shallow containers encourage more efficient employment of fish-house space through increased possible water surface area. In aquaria four to five feet long, eighteen inches wide, and twelve inches in total depth, 200-300 fishes can be accommodated throughout the whole growing period

without any need for further unwanted disturbances.

Swordtails are especially fond of eating their own young or any other fry available and this proclivity can be used to good effect in the rearing aquaria. There is no point in going to a lot of trouble to obtain offspring from particular parents if they are then going to get mixed up with others being born from brother and sister matings in the rearing aquaria. Guppies, especially, pose this problem and the inevitable end result is a conglomeration of the wanted fry with others both in this way which will be deformed through inbreeding or stunted through not being able to get off to a good start in such a competitive environment, or both. It pays, therefore, to grow up Swordtails with the other livebearers so that by the time any females are able to drop fry the swordtails are big enough to eat them immediately. Speckled mollies can also be used thus.

In conclusion then, if the aquarist can raise sizeable batches of good home-bred fishes regularly he should be able to sell them easily enough. It is important to appreciate, however, that the price obtained from a dealer will not approach the final selling price charged to the retail customer. For a home breeder to be offered half of that amount is about as much as can be expected, and this perhaps only after he has established a reliable reputation with an individual dealer. Profit margins on fish sold retail are traditionally high, to cover losses and the current high overheads involved. In spite of this, if the aquarist can evolve an efficient system including setting up his aquaria in a properly insulated building, then it is still possible to more than offset expenses and to pay for the upkeep of other aquatic interests which are non-productive.

THE BLUE ACARA— —AN IMPETUOUS BREEDER

by M. H. Southom

AFTER having played around with community tanks for several years, I decided to specialise in a Cichlid. For aesthetic reasons I at first chose the Jack Dempsey and bought a 20 gallon tank for the purpose of breeding. But it so happened that on a visit to my local fish shop I noticed a pair of mature Blue Acaras looking decidedly unhappy in a corner of a large community tank. They had obviously just been brought in by an aquarist who could no longer look after them. So in a rash moment I decided to buy them. The largest was unmistakably a male, displaying the pointed dorsal fin, but the smaller of the two, I was advised by the fishkeeper, was probably a female but could be an undeveloped male.

I arranged various large stones around the tank, using granite and flint which have since become covered in a carpet of *algae*. At this point I must say that I agree with a certain correspondent to the *Aquarist* concerning community tanks. It is not until a species is kept alone (and in the right conditions) that it is possible to study and appreciate its behaviour. Community tanks are very suitable for Dentists'

waiting rooms and hospital wards, but for the serious aquarist they do not offer the individuality necessary for fish to be appreciated. I am now talking not only from a biological behavioural point of view, but also in respect of a 'pet' fish which develops its character to a greater extent when alone or with a mate only. But in any case this argument is not relevant here as fish may only be bred alone.

I installed my supposed pair of Blue Acaras in the spacious 20 gallon tank and sat back. They both appeared to recover from their ordeal in the fish shop, and the iridescent light blue came back to the gills and a tint of red soon appeared in the fins with a border of yellow lining the top of the dorsal fins. I proceeded to feed them up with white worms, earthworms and dried food. I later found I could breed white worms very easily. Take a small log or a large stone and make a small depression on a compost heap or on a flower bed. Fill it with cooked vegetables or any cooked food, and place the log or stone firmly on top. After a week lift the log and there will be clusters of white worms collected around the decaying food. But a diet based on white worms can lead to

intestinal troubles in fish.

During this period of 'feeding up' the fins became tinted with a deep red and the normal brown backgrounds turned a light grey colour making the black bands stand out well. Gradually the male's dorsal fin rose and after a week both of them were flaring their fins arrogantly. Ten days after buying them I noticed the female pecking at a flat rock repeatedly. She was obviously quite excited. But the male was very apathetic towards this rock-cleaning and so I didn't conclude that they were about to breed. However, an hour later I saw a layer of light-coloured eggs about the size of plastic pin-heads, from 300-400 in all. I was naturally very pleased with this spawning—the first ever in my tanks—but I was soon engrossed in their fascinating behaviour.

The female hovers above the eggs or rather rests her ventral fins on them fanning with her pectoral fins. This movement of water over the eggs prevents organic matter which could carry bacteria, settling among the eggs. Meanwhile the male swims around at the other end of the tank looking very detached. The female seemed dominant over the male on this first spawning and I was worried in case the male in his apathy should decide to eat the eggs. But to my relief he did become more interested and they soon started taking it in shifts to fan the eggs. I would very much like to research into this area of behaviour.

There seems to be a sign from one or the other which causes the fish which is fanning to vacate the rock, letting the other fish take over.

Within three days the eggs began to hatch, jerking up and down with their tails outside and their heads inside. As soon as the parents saw this movement they rushed in taking 5 at a time in their mouths to a previously prepared hollow in the gravel. The female would stay with the eggs, sucking up as many as possible, until the male swam up at which she would swim down to the hollow and using this 'relay' system within half a minute the rock was clear. It is an incredible sight.

In 4 days the fry were free-swimming and the parents herded them like sheepdogs herd sheep.

There seems to be a very simple technique in breeding fish. The aquarist must reproduce the conditions which in the rivers cause the fish to breed. Once a year during the rains the rivers flood over on to grasslands and masses of insects are washed down into the rivers. The pH is also probably changed slightly. So really almost more important than what you feed your fish on, is that you make a significant change in their environment. For example, I find that a sudden inundation of *Daphnia* after a week without the lights on and little food results in prolific breeding with two batches of eggs.

My Acaras have just bred for the fourth time.

NEWS FILTERS THROUGH

by Jennifer Baker

FOR over a year, an Airstream Super Twin filter has kept my 24 in. x 12 in. x 15 in. tank sparkling clear, in spite of the tireless dredging operations of my four medium-sized Bristol Shubunkins. Apart from changing the filter medium with reasonable regularity, I have paid it little attention, except for the couple of occasions when it brought first a tragedy, and then an altogether unlooked-for addition to the tank it serves.

For six months or so, a Spotted Weather Fish (*Cobitis taenia*) some 4 inches long and magnificently bewhiskered kept company with the shubunkins. I soon became accustomed to 'missing' it from the tank, only to catch sight of a beady eye and perhaps a couple of stray whiskers just emerging from the gravel in some shady corner—for, of course, this

fish loves to burrow in the aquarium compost. He (definitely male with those whiskers!) also spent much time apparently 'basking' beneath the top light, coiled gracefully around a sturdy stem of wistaria. Most of the daylight hours he spent thus relaxing, but when the light was switched off, he made several lightning darts around the tank and then settled down systematically to 'vacuum' over the tank floor for the occasional particle of food neglected or perhaps rejected by the shubunkins. In view of his odd lifestyle, I was not perturbed one morning when I peered briefly into the tank before carrying out various maintenance tasks, and was unable to find him. I assumed he was 'resting' somewhere out of my sight (though doubtless, I thought, he

would have at least *one* beady eye fixed upon me!) So I was a little startled when, on reaching into the filter box to remove the siphon pipes, I glimpsed an outsize set of whiskers wagging irately and felt a very slippery and highly agile body brush past my fingers. I withdrew my hand rather hastily and saw a frantically flailing tail disappearing into the filter wool. A messy ten minutes followed—but eventually Mr. Weather Fish was back in the tank, none the worse for his day 'out'.

I should say that I had abandoned the sieves on the siphon pipes, as they became clogged so quickly. Clearly Mr. Weather Fish, with his lithe tube-shaped body, had swum up one of the siphon pipes into the filter box where I had come upon him so unexpectedly. And having made this perilous journey once, he did it again, and again, and again! Almost every day, I would come across him in the filter box, whiskers twitching, beady eyes motionless, munching on a tasty morsel of detritus trapped in the filter wool! I became quite adept at nudging him neatly into a net and returning him to the tank. Briefly, I replaced the sieves, but they soon became as clogged as before, and I abandoned them. I racked my brains to find a way of letting into the siphon pipes the maximum tank waste whilst keeping out Mr. Weather Fish. Then one morning, I bent down to get the net to return him yet again to the tank, and when I straightened up, he was gone! One minute twitching his whiskers, next minute nothing! I was just about to dismantle the filter box and search for him in the wool when I caught a glimpse of an eel-like body flashing along the bottom of the tank. I blinked and looked again—and I could swear that Mr. Weather Fish, lying sedately upon a large flat rock, was laughing at me. The beady eye even seemed to wink! From then on, since he could obviously get out of the filter box without my assistance, I let him! Presumably he swam down a siphon pipe *against* the flow of the water—no mean feat—but I never saw him do it. (I have read of other such ingenious fishes). For the next few weeks, Mr. Weather Fish's clever trick was recounted to family and friends, and when I came across him in the filter box, we would stare at one another quite placidly.

One evening, I came home late and flopped into a chair. My eye caught sight of—a twig, was it?—on the floor almost under the table. Curiosity overcame me, I got up to have a look. Yes, it seemed to be a twig, twisted and shrivelled. But where could it have come from? Oh no! I was quite overcome. This 'twig' was poor, dried up Mr. Weather Fish. Shuddering, I made myself pick him up. He was quite dry, quite hard and quite obviously dead. But hadn't I read that fish can be revived even when all hope seems lost? Frantically,

I filled a bowl and lowered the desiccated body gently into the water. It floated, perfectly still. I couldn't bear to look any longer. The next morning, my husband flushed the lifeless remains of Mr. Weather Fish down the toilet.

It had simply never crossed my mind that he might try an alternative route home from the filter box, though I suppose I should have realised that Weather Fishes jump! But hindsight couldn't help Mr. Weather Fish; I concentrated on my shubunkins. When around a year old, they were 3-4 inches long with fine finnage though not too well coloured by show standards. In the early autumn of last year, I was very busy with a new term, and I must confess that three weeks passed before I suddenly remembered that it was high time I cleaned out the filter. As usual, I tipped the contents of the box into a plastic bowl, and was just about to pour away the water when I thought I saw something move—that is, move under its own propulsion rather than simply floating around as I wobbled the bowl. I peered into the rather disgusting and smelly mess . . . and saw one—no—two—no—three silver slivers of transparent something-or-other dart beneath a mass of dirty wool. Wrinkling my nose, I picked out of the bowl all the solid material, examining each piece carefully before I discarded it. Then I let the contents of the bowl settle, and eventually I was rewarded. The slivers were still there, motionless against one side. It had by now dawned on me that these must be baby fish—alevins—sucked up, perhaps at the egg stage, into the siphon pipes and deposited safely into the inches of water above the wool in the filter box. What a thousand-to-one chance! A breeding trap could not have protected them more successfully against their voracious parents! Of course, many more must have perished, providing a tasty snack for the adults, but since I had no idea the fish had spawned, had never even noticed any signs of pre-spawning activity, I was delighted with these three survivors. I reared them successfully in a bowl, to the stage where they looked like miniature fish, and then put them with some small tropicals in a coolish tank. After about two months, I placed them in my fantail tank where they grew rapidly. It became apparent that I had a rather neat genetic line-up—one metallic, one nacreous, one matt (another nacreous and the team would have been complete!) Unfortunately, the matt fish disappeared whilst we were away over Christmas—presumably devoured by the larger fantails—but the other two have now joined their parents in my Christmas present, a 36 in. tank, and are growing well. They won't make show-grade in colour, but they are attractive enough to me. Indeed, their against-the-odds survival almost makes up for the untimely demise of poor Mr. Weather Fish!



from AQUARISTS' SOCIETIES

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

TWO films from the Bristol Waterworks Company provided an informative evening for Bristol A.S. The first dealt with the various ways water is collected, purified and distributed, while the second gave fascinating glimpses of wild life on Chew Lake with a commentary by Dame Flora Robson.

The films were shown to a capacity audience underscoring the interest this subject has had for everybody at the present time.

RECENTLY the Bleanau Gwent A.S. presented an aquarium to the Tillery Court Disabled Centre at Aberillery. The presentation was made by R. Baker, Mayor of Aberillery on behalf of the Bleanau Gwent A.S. and Councillor E. Chickens, chairman of the Gwent Social Services accepted on behalf of the Centre. Thanks for the generosity of the B.G.A.S. was expressed by Councillor T. Mitton chairman of the Gwent County Council.

At the half-yearly meeting R. Brown was elected vice-chairman and J. Taylor re-elected as secretary, and also in July the society had a talk by R. Francis of the Fancy Guppy Association which included methods of breeding, feeding and general care of guppies. The August meetings were taken up by general club meetings and participation in the Welsh open show.

The winter programme will include talks by experts on fishkeeping, visits to other societies for social evenings and C.N.A.A. club competition and slide/tape lectures. Any new members who wish to join can be assured of a welcome and interesting meetings which are held fortnightly on Tuesdays at Bleanau Gwent Working Men's club lounge at 7.30 p.m.

AT a highly successful August meeting of the King's Lynn A.S. members were given a talk by Mr. Littlewood of Honeysome Aquatics on aquatic plants. Advice was given on best lighting conditions and many other aspects of planting an aquarium. Members were asked to try and identify a number of plants and Mr. V. George succeeded in naming most of them, his prize being a large selection of plants. This talk was thoroughly enjoyed by everyone present and is to be recommended to other societies.

Meetings are held at 8 p.m. on the second Thursday of each month at the Victoria P. House, Loke Road, King's Lynn, and anyone interested in any aspect of fishkeeping is always very welcome. Club secretary is D. Mackay, tel.: Downham 3010.

RESULTS of the Tonbridge and District A.S. open show were as follows:—Class Ak:

holamid A TABLET A DAY, SENDS WHITE SPOT AWAY
Hillside Aquatics London N12

1, Mrs. B. Scates (Erith); 2, K. Beadle (B.K.A.); 3, A. Feast (Tonbridge); 4, V. A. Feast (Tonbridge). Class B: 1 and 2, J. E. Bellingham (Tonbridge); 3, B. Sayers (Brighton); 4, P. Moye (Sudbury). Class Ba: 1 and 2, J. E. Bellingham (Tonbridge); 3, E. and T. Tester (Mid-Sussex); 4, D. and B. Purchard (Tonbridge). Class C: 1, R. F. Thoday (Bramtree); 2, J. Brown (Croydon); 3, P. Moye (Sudbury); 4, Mrs. M. Netherell (Riverside). Class Ca: 1, L. Brazier (Sudbury); 2, J. Hughes (Rochampton); 3 and 4, R. Thoday (Bramtree). Class Cb: 1 and 2, J. Brazier (Sudbury); 3, P. A. Moye (Sudbury); 4, Mrs. B. Scates (Erith). Class Da: 1 and 2, C. and D. Finnis (Strood); 3, A. C. Best (Strood); 4, E. and T. Tester (Mid-Sussex). Class D: 1, T. and J. Ramshaw (Brighton); 2, W. A. Knight (Gosport); 3, Mrs. M. Netherell (Riverside); 4, R. Felham (Tonbridge). Class Db: 1, R. S. Smith (Corringham); 2, P. Moye (Sudbury); 3, Mrs. A. Greenhall (Beckleyheath); 4, A. Johnson (Pince). Class Dc: 1 and 2, W. A. Knight (Gosport); 3, Mrs. Edwards (Thanet); 4, Mr. Houghton (Brighton). Class E: 1, C. and D. Finnis (Strood); 2, J. W. F. Hughes (Rochampton); 3, A. L. Noronha (Orpington); 4, T. and J. Ramshaw (Brighton). Class Ea: 1, Mr. and Mrs. Shirley (Godalming); 2, W. A. Knight (Gosport); 3, A. Bradnam (Tonbridge); 4, Mr. and Mrs. Woodward (Beckleyheath). Class F: 1, R. F. Thoday (Bramtree); 2, Mrs. B. Scates (Erith); 3 and 4, Mr. and Mrs. Shiner (B.K.A.). Class G: 1, B. C. Fry (Beckleyheath); 2, R. F. Thoday (Bramtree); 3, J. and J. Bookes (C.A.G.B.); 4, G. Nichols (Mid-Kent). Class H: 1, K. Nichols (Mid-Kent); 2 and 4, Mrs. M. Netherell (Riverside); 3, Mrs. B. Scates (Erith). Class I: 1 and 2, T. and J. Ramshaw (Brighton); 3, A. Feast (Tonbridge); 4, K. Dryden (Croydon). Class K: 1, T. and J. Ramshaw (Brighton); 2, G. Beal (Corringham); 3, J. Brown (Croydon); 4, T. Skeet (Croydon). Class L: 1, A. Feast (Tonbridge); 2, E. and T. Tester (Mid-Sussex); 3, Mrs. G. Sandford (Redhill and Reigate); 4, R. F. Thoday (Bramtree). Class M: 1, R. F. Thoday (Bramtree); 2 and 3, R. Roland (Bramtree); 4, S. Bartlett (Sudbury). Class Ma: 1, Mr. Rooney (Brighton); 2, Mrs. M. Netherell (Riverside); 3, Mr. Purchard (Tonbridge); 4, K. Nichols (Mid-Kent). Class Nb-m: 1, Mr. Houghton (Brighton); 2, R. F. Thoday (Bramtree); 3, A. E. Noronha (Orpington); 4, Mrs. A. Baker (Tonbridge). Class No-t: 1 and 2, A. E. Noronha (Orpington); 3, L. J. Brazier (Sudbury); 4, J. Jackson (Basingstoke). Class O: 1 and 4, A. Sharp (Corringham); 2, A. Gardener (Redhill and Reigate); 3, A. E. Noronha (Orpington). Class P: 1, J. H. Jackson (Basingstoke); 2, E. and T. Tester (Mid-Sussex); 3, A. E. Noronha (Orpington); 4, A. D. Sharp (Corringham). Class Q: 1, A. E. Noronha (Orpington); 2 and 3, M. Collins (Mid-Kent); 4, G. Owen (Orpington). Class R: 1, A. E. Noronha (Orpington); 2, W. A. Knight (Gosport); 3, S. Bartlett (Sudbury); 4, C. and D. Finnis (Strood). Class S: 1, J. Smith (Brighton); 2, S. Edwards (Thanet); 3, B. Hooper (Brighton); 4, T. Skeet (Croydon). Class T: 1 and 3, K. Dryden (Croydon); 2, J. Jackson (Basingstoke); 4, Mrs. D. Crankshaw (Eding). Class U: 1, Miss L. Feast (Tonbridge); 2, B. C. Fry (Beckleyheath); 3, J. Hughes (Rochampton); 4, D. Pearson (Tonbridge). Class V: 1 and 2, D. G. Wood

(Corringham); 3, B. C. Fry (Beckleyheath); 4, D. and S. Jackson (Redhill and Reigate). Class W: 1, Miss S. Edwards (Thanet); 2 and 3, B. C. Fry (Beckleyheath); 4, J. Hughes (Rochampton). Class Xb-m: 1 and 2, R. F. Thoday (Bramtree); 3, J. Kelly (Folkestone); 4, Mr. and Mrs. Shiner (B.K.A.). Class Xo-t: 1, 2 and 4, A. E. Noronha (Orpington); 3, J. H. Jackson (Basingstoke). Class Z: 1 and 2, Mr. and Mrs. Shirley (Godalming); 3, Mr. and Mrs. Woodward (Beckleyheath); 4, Mrs. M. and T. Tester (Mid-Sussex); 5, E. and T. Tester (Mid-Sussex); 6, J. Mathison (Tonbridge). The Best Fish in the Show trophy was won by R. C. Smith of Corringham A.S. and A. Noronha of Orpington won the award for the most successful exhibitor.

IN July Doctor Ford, a member of the Goldfish Society of Great Britain, gave an interesting, illustrated lecture to members of the society. Dr. Ford, was responsible for the development of the new flake food for feeding fishes, called Aquarion.

He spoke for nearly two hours and with the aid of slides told of the development, methods of manufacture, and how they control the quality of the flakes. The flakes were tested on fish in his laboratory for several years before they were put on the market. He has travelled around the world talking to the leading fish breeders and seeking their advice on fish feeding, and all this information, along with his own research played an important part in the development of this fish food.

TABLE show results at the Llanwit Major A.S. August meeting were: Carfish: 1, J. F. Edwards; 2 and 4, Mr. and Mrs. M. C. Guthrie; 3, J. Thomson, A.O.V.; 1, G. Fry; 2, 3 and 4, M. Eady. During the judging R. S. Wigg gave a talk on livebreeders.

ON Monday the 18th October the Lincoln and District A.S. is holding a Bring-and-Buy Sale at the Liberal Club, St. Swinburn Square, Lincoln. The usual 15 per cent to the society. Everyone who comes will be made most welcome.

THE Grimsby and Cleethorpes A.S. held a very successful open show with 516 exhibits. The Best Fish in Show award was won by Mr. and Mrs. Vernon (Retford) and the society with most points was Castledorf. Results:—Guppy: 1, N. Blenking (Bridlington); 2, Mr. and Mrs. E. Kirk (S. Humberston); 3, Mr. and Mrs. Richmond (Retford). Swordtail: 1, Mr. and Mrs. Blades (Bassetlaw); 2 and 3, Mr. and Mrs. E. Kirk (S. Humberston). Mollie: 1, Mr. and Mrs. Holmes (Castledorf); 2, Mr. and Mrs. K. Petty (Castledorf); 3, G. Hoodless (Scunthorpe and District). Platy: 1, Mr. and Mrs. Goulding (Immingham); 2, Mr. and Mrs. K. Welsh (Yock); 3, Mr. and Mrs. Blades (Bassetlaw). A.O.V. Livebearer: 1, A. Piggott (Grimsby and Cleethorpes); 2, B. Jackson (Doncaster); 3, Mr. and Mrs. Moore (Sheaf Valley). Small Barbs: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. and Mrs. Emmerson (Castledorf); 3, J. Banks (Macclesborough). Large Barbs: 1, A. Cook (Retford); 2, Mr. and Mrs. G. Berry (Scunthorpe and District); 3, J. Emmerson (Castledorf). Small Characin: 1 and 2, B. Bins and Galdon (Scunthorpe Museum); 3, B. Ward (Doncaster). Large Characin: 1, J. A. Whitley (Aireborough); 2, H. Thorpe (Doncaster); 3, G. Frisby (Hull). Dwarf Cichlid: 1, B. Bins and Galdon (Scunthorpe Museum); 2, R. Ranson (Grimsby and Cleethorpes); 3, Mr. and Mrs. P. Moerissey (Immingham). Large Cichlid: 1, Mr. and Mrs. Vernon (Retford); 2, Mr. and Mrs. Burman (Scunthorpe and District); 3, A. Cook (Retford). Angel: 1, A. Piggott (Grimsby and Cleethorpes); 2, Mr. and Mrs. E. Kirk (S. Humberston); 3, Mr. and Mrs. Richmond (Retford). Rift Valley: 1, Mr. and Mrs. P. Berry (Scunthorpe and District); 2, Mr. and Mrs. Fletcher (Doncaster); 3, Mrs. Greenwood (Immingham). Corydoras and Bechtis: 1, Mr. and Mrs. Holmes (Castledorf);

2, Mr. Carrick (Castleford); 3, Mr. and Mrs. Fletcher (Doncaster). A.O.V. Catfish: 1, T. Sanderson (Thorne); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Chester (Retford). Loaches: 1 and 2, Binns and Caidon (Scunthorpe Museum); 3, T. Sanderson (Thorne). Sharks and Foxes: 1, Mr. and Mrs. Goulding (Immingham); 2, S. White (Retford); 3, T. Sands (Bosson). Small Anabantid: 1, A. Clayton (Immingham); 2, Mr. and Mrs. Davenport (S. Humberside); 3, T. Tidwell (Grimsby and Cleethorpes). Siamese Fighter: 1, Mr. and Mrs. Chester (Retford); 2, Mr. Hooley (Bassetlaw); 3, Mr. and Mrs. J. Riley (Castleford). A.O.V. Anabantid: 1, Mr. and Mrs. K. Petty (Castleford); 2, J. Hanks (Mexborough); 3, Mr. and Mrs. J. Riley (Castleford). Goldfish and Comets: 1, L. Cox (S. Humberside); 2, D. Alcock (Grimsby and Cleethorpes); 3, G. Greenham (Grimsby and Cleethorpes). Shubunkins and Fancy Goldfish: 1, Mrs. Fulker (S. Humberside); 2, Mrs. Carter (Independent); 3, G. Greenham (Independent). A.O.V. Goldfish: 1, D. W. Jordan (S. Humberside); 2, Mr. Lancashire (Doncaster); 3, Binns and Caidon (Scunthorpe Museum). Killifish: 1, Mrs. Bee (Grimsby and Cleethorpes); 2, Mr. and Mrs. Chester (Retford); 3, J. Banks (Methborough). Danios and Minnows: 1 and 2, Mr. and Mrs. R. Lake (S. Humberside); 2, A. Clayton (Immingham); 3, A. Onslow (Loughborough). A.O.V. Tropical: 1, Mr. Carrick (Castleford); 2, Mr. and Mrs. Fletcher (Doncaster); 3, Mr. and Mrs. Holmes (Castleford). Marines: 1, L. Cox (S. Humberside); 2, Mrs. R. Baguley (Grimsby and Cleethorpes); 3, Mr. Cass (S. Humberside). True Pairs (Egglayers): 1, Mr. Carrick (Castleford); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. E. Kirk (S. Humberside). True Pairs (Livebearers): 1 and 2, B. Jackson (Doncaster); 3, Mr. and Mrs. Goulding (Immingham). Novices: 1, T. Tidwell (Grimsby and Cleethorpes); 2, Mr. Fountain (S. Humberside); 3, J. Balderson (Grimsby and Cleethorpes). Breeders (Egglayer 1-10): 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Goulding (Immingham); 3, S. White (Retford). Breeders (Egglayer 11-20): 1, S. White (Retford); 2, B. Jackson (Doncaster); 3, Mr. and Mrs. K. Welsh (York). Breeders (Livebearer 1-10): 1, Mr. and Mrs. Chester (Retford); 2, K. Prendergast (Boston); 3, A. Piggott (Grimsby and Cleethorpes). Breeders (Livebearer 11-20): 1, B. Jackson (Doncaster); 2, Mr. and Mrs. Hopkinson (Darfield); 3, Ladies Section: 1, Mrs. Petty (Castleford); 2, Mrs. M. Tidwell (Grimsby and Cleethorpes); 3, Mrs. Fletcher (Doncaster). Junior: 1, S. White (Retford); 2, M. and T. Holmes (Castleford); 3, J. Emerson (Castleford).

A TABLE show will be held by the **Ichiban Rancho Society** at 2.30 p.m. on Saturday, 26th October. Entries will be confined to members only, but prospective members and Rancho enthusiasts are ensured of a warm welcome. For further details please contact Mrs. E. Davidson, 14 Garnetts, Takeley, Nr. Bishops Cleeve, Herts CM22 6R. Telephone: Bishops Cleeve 870395.

IN August the **Merthyr A.S.** held a mini-furnished aquaria competition and the results were: 1, R. Purdy; 2, A. Payne; 3, P. Burton; 4, Gwendal Burton. There was also an inter-club friendly with Cardiff A.S., the classes and winners being: Six Best Egglayers: 1, 3 and 5, C. Turner (Cardiff); 2, 4 and 6, E. Morgan (Merthyr). Six Best Livebearers: 1 and 4, R. Purdy (Merthyr); 2, B. Baw (Merthyr); 3 and 5, C. Turner (Cardiff); 6, M. Davies (Merthyr). Total points: Cardiff 18; Merthyr 24.

THE second show of the **Dunlop A.K.S.** was extremely successful with seven hundred and fifty entries. The results were as follows: Guppies: 1, E. Seymour (Merseyside); 2, K. Thompson (Merseyside); 3, A. Whitaker (Macclesfield). Platies: 1, K. Wright (Sandgrounders); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, H. Buckley (Northwich). Swordtails: 1, B. W. Carter (St. Helens); 2, J.

Buckley (Northwich); 3, T. Paux (Merseyside). Mollies: 1, E. Seymour (Merseyside); 2, R. Armstrong (Dunlop); 3, B. W. Carter (St. Helens). A.O.V. Livebearers: 1, R. Grant (Merseyside); 2, Master I. Hopkins (Dunlop); 3, Mr. and Mrs. K. B. Agar (Aireborough). Small Anabantid: 1, T. Hampton (Dunlop); 2, Master I. Hopkins (Dunlop); 3, P. and A. Squirrell (Wythamshaw). Large Anabantid: 1, E. M. Stillwell (Sandgrounders); 2, Mrs. R. Houghton (Southport); 3, D. Algie (St. Helens). Fishers: 1, Mr. and Mrs. Tomlinson (Macclesfield); 2, P. Atkinson (Southport); 3, T. E. Davies (Heywood). Small Cichlids: 1, P. Walsh (Blackburn); 2, P. Jones (Wrexham); 3, T. Hampton (Dunlop). Large Cichlids: 1 and 2, J. Radley (Heywood); 3, R. Lamb (Southport). Angels: 1, F. Oliver (Wrexham); 2, G. Parr (St. Helens); 3, M. Reilly (Wythamshaw). Rift Valley Cichlids: 1, E. M. Stillwell (Sandgrounders); 2 and 3, S. Wolstenholme (Heywood). Small Barbs: 1, Mrs. R. Houghton (Southport); 2, J. Buckley (Northwich); 3, H. Butler (Dunlop). Large Barbs: 1, C. Eason (Sandgrounders); 2, A. Vassiere (Merseyside); 3, A. Davies (Dunlop). Small Characins: 1, Miss S. Goddard (Macclesfield); 2, R. J. Stephens (Blackburn); 3, Mrs. R. Houghton (Southport). Large Characins: 1, Mrs. R. Houghton (Southport); 2, Poulton Bros. (Southport); 3, S. Seymour (Merseyside). Toothcarps: 1, Mr. and Mrs. J. Taylor (Merseyside); 2, J. Buckley (Northwich); 3, R. Paine (Merseyside). Minnows: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, Mrs. R. Houghton (Southport); 3, R. J. Stephens (Blackburn). Danios: 1, L. Newton (Blackburn); 2, R. J. Stephens (Blackburn); 3, A. Bolan (Wythamshaw). Rasboras: 1, Mrs. R. Houghton (Southport); 2, M. Howarth (Morecambe Bay); 3, R. Jervis (Sandgrounders). Corydoras and Brechias: 1, B. W. Carter (St. Helens); 2, T. Hampton (Dunlop); 3, D. R. Reading (Merseyside). A.O.V. Catfish: 1, L. Newton (Blackburn); 2, Mrs. R. Houghton (Southport); 3, R. Lamb (Southport). Loaches: 1, S. Wolstenholme (Heywood); 2, Master I. Hopkins (Dunlop); 3, B. Newport (Runcorn). Sharks: 1, T. Claves (Dunlop); 2, R. Armstrong (Dunlop); 3, B. Dawson (Heywood). Flying Foxes: 1, R. Armstrong (Dunlop); 2, Mrs. D. T. Armour (Independent); 3, B. Dawson (Heywood). Breeders Egglayers (Hard): 1 and 2, A. Vassiere (Merseyside); 3, P. and A. Squirrell (Wythamshaw). Breeders Egglayers (Easy): 1, S. Foote (Accrington); 2, J. Radley (Heywood); 3, D. Wilson (Merseyside). Breeders (Livebearers): 1 and 2, Poulton Bros. (Southport); 3, L. Newton (Blackburn). Pates (Egglayers): 1 and 2, R. J. Stephens (Blackburn); 3, A. Vassiere (Merseyside). Pates (Livebearers): 1, B. Parr (Hyde); 2, B. W. Carter (St. Helens); 3, A. Bailey (N. Warwick). A.O.V.: 1, P. Walsh (Blackburn); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, R. Lamb (Southport). Juniors (Egglayers): 1, Master M. Burgoyne (Bridgewater); 2, Miss J. Baldwin (Sandgrounders); 3, Master I. Hopkins (Dunlop). Juniors (Livebearers): 1 and 2, Paula and Sandra Taylor (Merseyside); 3, Miss S. McBridge (Aireborough). Common Goldfish: 1, S. Foote (Accrington); 2, E. Seymour (Merseyside); 3, C. H. Whitney (Accrington). Fancy Goldfish: 1 and 3, Mrs. Hall (Aireborough); 2, S. Foote (Accrington). A.O.V. Goldfish: 1, S. Walsh (Accrington); 2, D. R. Reading (Merseyside); 3, Mr. and Mrs. Harvey (Sandgrounders). Marine: 1, P. and A. Squirrell (Wythamshaw); 2, J. Midgley (Wythamshaw). 3, D. A. Neave (Hoylake). Ladies: 1, Mrs. B. Sey (Dunlop); 2, Mrs. A. Hopkins (Dunlop); 3, Mrs. J. Warner (Vale Royal). Mini-Jars: 1, F. Oliver (Wrexham); 2, Mr. and Mrs. K. B. Agar (Aireborough); 3, B. Jones (Wrexham).

IN August the **New Forest A.S.** were hosts to Pisces A.S. and Bournemouth A.S. who were entertained with a table show and quiz. The quiz master was A. Weir (chairman of Southampton A.S.) and the winning team were Bournemouth A.S. The fish classes were: Rasbora, Characin and Dario/W.C.M. Minnow, and these were judged by Mr. Markham of the Petersfield A.S. Results: 1, Bournemouth A.S.; 2, Pisces A.S.; 3, New Forest A.S.

The next leg of the competition will be held at the Community Centre, Pelhams Park, Winton, Bournemouth, when Bournemouth A.S. will be the hosts, on Monday, 4th October. The New Forest A.S. secretary is R. Travers, 6 Auckland Avenue, Brockenhurst, Hants SO4 7RS, who will be pleased to supply details of membership on application.

THE successful **Reigate and Redhill A.S.** open show was unfortunately marred by the untimely death of several exhibits while they were on the bench. The society has made every attempt to discover the cause of the fatalities and the East Surrey Water Company were very helpful when approached with the matter. It appears that Bletchingley is the first draw-off point from the pumping station where the chlorine is added and, although the dosage is minimal, it was sufficient to cause distress or, as in some cases at the show, death. The pH is between 8 and 9 and the hardness is approximately 100ppm. To combat the chlorine it is recommended that any water used should be sprayed from the tap and left to stand for 24 hours so that the chlorine may disperse. As the show is to be held at the same venue next year the above precaution and any other action necessary will be taken to safeguard the exhibits. It is hoped that this will not discourage people from entering future shows, whether they are Reigate and Redhill A.S. or those of any other club and the society apologise for this unforeseen happening. Results were as follows:—

Class Ag: 1 and 2, R. Paine (Haslemere); 3, Mrs. Rushbrooke (Reading); 4, L. Woolfer (Haslemere). Class B: 1, Doris Crickshank (Ealing); 2 and 3, J. Bellingham (Tonbridge); 4, K. Groves (Horsham). Class Ba: 1 and 2, J. Netherell (Riverside); 3, K. Smith (Rimneyrède); 4, T. and J. Ramshaw (Brighton and Southern). Class C: 1, Mr. and Mrs. M. Rooney (Brighton and Southern); 2, T. and J. Ramshaw (Brighton and Southern); 3, A. E. Noronha (Orpington); 4, R. D. Wright (Croydon). Class Ca: 1, T. Skeet (Croydon); 2, Mrs. A. Holmes (Crawley); 3, J. Cole (Reigate and Redhill); 4, Mrs. P. Edwards (Thames). Class D: 1, B. Sayers (Brighton and Southern); 2, Mrs. Val Connolly (Gosport); 3 and 4, May Netherell (Riverside). Class Db: 1, Mr. Hooper (Brighton and Southern); 2 and 3, W. J. Sutton (Catfish Association G.B.); 4, Mrs. Beattie (Godalming). Class Dc: 1, Mr. and Mrs. Ron Houghton (Brighton and Southern); 2, K. Connolly (Gosport); 3 and 4, P. Chapman (Brighton and Southern). Class E: 1, F. Dean (Caterham Nomads); 2, J. Netherell (Riverside); 3, Mr. Hooper (Brighton and Southern); 4, Mrs. Lees (Corby). Class Ea: 1, R. Shirley (Haslemere); 2, K. Connolly (Gosport); 3, Mr. and Mrs. L. Tilly (Saracens); 4, B. Sayers (Brighton and Southern). Class F: 1, Gina Sandford (Reigate and Redhill); 2, P. Wint (Reigate and Redhill); 3, W. Morton (Reigate and Redhill); 4, D. Robson (B.K.A.). Class G: 1, B. Nicholls (Mid-Kent); 2, Mr. and Mrs. M. Rooney (Brighton and Southern); 3, Mr. and Mrs. Ron Houghton (Brighton and Southern); 4, R. D. Wright (Croydon). Class H: 1 and 4, May Netherell (Riverside); 2, B. Nicholls (Mid-Kent); 3, R. J. Hard (Haslemere). Class J: 1, T. and J. Ramshaw (Brighton and Southern); 2, J. Randall (Midhurst); 3, A. I. Feast (Tonbridge); 4, B. Sayers (Brighton and Southern). Class K: 1 and 3, R. G. Rice (Brighton and Southern); 2, Joe Netherell (Riverside); 4, T. Petherick (Reigate and Redhill). Class L: 1, M. West (Kingston); 2, W. P. Sutton (Catfish Association G.B.); 3, B. Nicholls (Mid-Kent); 4, K. Groves (Hors-

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sham). Class M: 1, K. Connolly (Gosport); 2, D. and B. Puchard (Tonbridge); 3, B. N. Barford (Saracens); 4, Mr. and Mrs. M. Rooney (Brighton and Southern). Class Nb-m: 1, K. Dryden (Croydon); 2, A. E. Noronha (Orpington); 3, K. Connolly (Gosport); 4, Doris Cruickshank (Ealing). Class No-t: 1, 2 and 4, A. E. Noronha (Orpington); 3, Mr. and Mrs. L. Tilley (Saracens). Class O: 1, J. H. Jackson (Basingstoke); 2, A. E. Noronha (Orpington); 3, B. N. Barford (Saracens); 4, D. Robson (B.K.A.). Class P: 1, Mrs. Lees (Corby); 2, 3 and 4, J. Randall (Midhurst). Class Q: 1, 2 and 4, A. E. Noronha (Orpington); 3, J. Holmes (Crowley). Class R: 1 and 3, R. J. Hard (Haslemere); 2, R. Winalade (Kingston); 4, A. E. Noronha (Orpington). Class S: 1, A. Shearer (Reigate and Redhill); 2, J. A. E. Smith (Brighton and Southern); 3, T. Cruickshank (Ealing); 4, D. Robson (B.K.A.). Class T: 1 and 3, K. Dryden (Croydon); 2 and 4, A. E. Noronha (Orpington). Class U: 1, D. J. Mackay (Kingston); 2, J. Randall (Midhurst); 3, Hazel Gardner (Reigate and Redhill); 4, R. J. Hard (Haslemere). Class V: 1 and 2, Hazel Gardner (Reigate and Redhill); 3, E. Binstead (Portsmouth); 4, Misses D. and S. Jackson (Basingstoke). Class W: 1 and 3, Mr. and Mrs. B. Fry (Bexleyheath); 2, B. N. Barford (Saracens); 4, J. Randall (Midhurst). Class Xb-m: 1, A. E. Noronha (Orpington); 2, Mr. and Mrs. L. Tilley (Saracens); 3, K. Connolly (Gosport); 4, J. H. Jackson (Basingstoke). Class Xo-t: 1, 2 and 4, A. E. Noronha (Orpington); 3, K. Dryden (Croydon). Class Z: 1, K. Connolly (Gosport); 2, J. Cole (Reigate and Redhill); 3, J. H. Jackson (Basingstoke); 4, W. F. Woodward (Bexleyheath).

THE Village Bar A.S. will be holding their open show in Birmingham on 19th December. The main attraction is the "Village Bar Trophy" for the British Native Fish Champion of Champions. Due to the need for proper care of these fish the society need to have some idea of the number of entrants to provide the necessary facilities. Please send all enquiries to the Aquarium Show Secretary, 81 Barton Road, Oldbury, West Midlands B68, with a S.A.E. by 5th November, and details will be sent. There will also be classes for tropical fish.

RESULTS of the Dorchester and District A.S. annual club show held in August were:—Furnished Aquarium: 1, Mrs. W. Voss; 2, P. Jefferies. Barbs: 1, D. Young; 2, C. Ackerman; 3, R. Christopher; 4, Fox Family. Characins: 1, R. Taylor; 2, D. Young; 3 and 4, G. Fitzgerald. Hermis. Hybns. Chirodon: 1 and 2, K. Mitchell; 3, M. Angel; 4, D. Norman. Gichlids: 1, D. Young; 2, G. Fitzgerald; 3 and 4, R. Taylor. Angels: 1, 2 and 4, D. Young; 3, H. Cornick. Labyrinth: 1, H. Tinsman; 2, M. and S. Ackerman; 3, N. Derrick; 4, R. Christopher. Siamese Fighters: 1, R. Taylor; 2, M. Hurst. Tropical Catfish: 1 and 2, R. Taylor; 3, D. Edwards; 4, R. Christopher. Corydeas and Brochis: 1, Fox Family; 2, D. Norman; 3, T. Fitzgerald; 4, R. Thompson. Rasboras: 1 and 4, D. Edwards; 2, Fox Family; 3, Mr. and Mrs. D. Young. Danios and W.C.M.M.: 1, Mrs. W. Voss; 2, Fox Family; 3, G. Moorcroft; 4, Mrs. Angel. Leach: 1, G. Fitzgerald; 2, R. Fitzgerald; 3 and 4, Fox Family. A.O.S. Egglayers: 1, J. Christopher; 2, M. Angel; 3, R. Christopher; 4, R. Thompson. Pairs of Fish: 1, A. Weller; 2 and 4, Fox Family; 3, M. and S. Ackerman. Guppy (Male): 1 and 4, D. Young; 2 and 3, R. Voss. Guppy (Female): 1, R. Voss; 2 and 3, Fox

Family; 4, G. Fitzgerald. Swordtails: 1, R. Voss; 2, P. Jefferies; 3, M. Hurst; 4, A. Weller. Platy: 1, M. Hurst; 2, H. Tinsman; 3, T. Fitzgerald. Molly: 1, R. Voss; 2, C. Ackerman; 3, W. Voss. A.O.S. Livebearer: 1 and 2, D. Young; 3, Fox Family. Common Goldfish and Comet: 1, Fox Family; 2 and 3, R. Voss; 4, G. Moorcroft. Shubunkins: 1, Fox Family; 2, H. Cornick. A.O.S. Coldwater: 1, D. Edwards; 2, J. Taylor. Breeders: 1, 2 and 3, D. Young; 4, K. Mitchell.

Results of the August table show were: Senior Barbs: 1 and 3, Mr. and Mrs. D. Young; 2, C. Ackerman; 4, R. Voss. Pairs: 1, Mrs. Angel; 2, Mr. and Mrs. D. Young; 3, D. Young. Junior Barbs: 1, M. and S. Ackerman; 2 and 3, G. Moorcroft. Pairs: 1, M. and S. Ackerman; 2 and 3, A. Weller.

OVER 400 tropical and coldwater fish were on display at the annual open show of the **Hounslow and District A.S.** The results were as follows:—Class Ak: 1, T. Butler; 2, R. S. Hart. Class B: 1, H. H. Crew; 2, P. Hoppenbrouwers; 3, A. C. Tull. Class Ba: 1, R. P. Adams; 2 and 3, H. Pratt. Class C: 1, M. Dore; 2, R. Hollins; 3, R. F. Thoday. Class Ca: 1, R. S. Hart; 2, R. F. Thoday; 3, A. Chaplin. Class D: 1 and 2, T. Butler; 3, R. P. Adams. Class Db: 1, F. P. Cripps; 2, A. Constantino; 3, R. S. Hart. Class De: 1, K. E. Taylor; 2, Mr. and Mrs. Houghton; 3, R. F. Thoday. Class E: 1, C. W. Goddard; 2, R. Rowland; 3, B. Brown. Class Fa: 1 and 2, R. Barford; 3, Mrs. M. Pratt. Class F: 1, R. Barford; 2, R. P. Thoday; 3, R. S. Hart. Class Fc: 1, D. B. F.; 1 and 3, M. Alexander; 2, A. H. Crew. Class G: 1, R. F. Adams; 2, R. P. Thoday; 3, T. J. Ramshaw. Class H: 1, J. Carpenter; 2 and 3, K. Taylor. Class J: 1, T. J. Ramshaw; 2, F. P. Cripps; 3, A. M. Crew. Class K: 1, J. Ramshaw; 2, D. Dore; 3, A. Chaplin. Class L: 1, M. Dore; 2, R. P. Thoday; 3, A. P. Taylor. Class M: 1, G. Biggs; 2, Mr. and Mrs. M. Rooney; 3, A. M. Crew. Class N-b: 1 and 2, A. E. Noronha; 3, D. Cheswright. Class O: 1, A. P. Taylor; 2, R. Barford; 3, A. E. Noronha. Class P: 1, A. M. Crew; 2, F. P. Cripps; 3, F. Adams. Class Q: 1, 2 and 3, A. E. Noronha. Class R: 1, A. E. Noronha; 2 and 3, A. Constantino. Class S: 1, J. Smith; 2, P. Hoppenbrouwers; 3, S. Powell. Class T: 1, A. E. Noronha; 2, M. Wright; 3, Mrs. D. Cruickshank. Class U: 1 and 3, F. Pinder; 2, F. Hoppenbrouwers. Class Ucd: 1, 2 and 3, H. Pratt. Class V: 1, F. Pinder; 2, J. Hughes; 3, P. C. Ross. Class W: 1 and 2, J. Hughes; 3, B. Brown. Class X-bm: 1, D. Cheswright; 2 and 3, R. P. Thoday. Class X-ot: 1 and 2, A. E. Noronha; 3, V. Valfely. Specialist: 1, J. V. Carpenter; 2, A. E. Noronha; 3, C. Cheswright. Highest club points: Orpington.

AT the first fortnightly meeting during August, the **Port Talbot and District A.S.** held a "bring and buy" auction, conducted by the chairman, J. Egan. It was one of the most successful held by the club, and club funds were boosted considerably. The other meeting took the form of a friendly inter-club match, with Rhondda A.S. who were comfortable winners by 26 pts. to 16 pts. Results were as follows: Class M: 1, G. Legge (Rhondda); 2 and 3, B. Ashcroft (Rhondda); 4, A. and M. Smith (Rhondda); 5, J. Egan (Port Talbot); 6, P. and Y. Watts (Rhondda). Class T: 1, B. Fouracre (Port Talbot); 2, Mr. and Mrs. Callister (Port Talbot); 3, M. Thomas (Rhondda); 4, B. Ashcroft (Rhondda); 5, B. Fouracre (Port Talbot); 6, C. Morrison (Port Talbot). Knock-out. A.O.V. Egglayers: 1, M. Thomas (Rhondda); 2 and 3, P. and Y. Watts (Rhondda); 4, T. Clifford (Port Talbot). A.O.V. Livebearers: 1, A. and M. Smith (Rhondda); 2, G. Legge (Rhondda); 3, C. Morrison (Port Talbot); 4, B. Ashcroft (Rhondda).

While judging was in progress, both clubs competed in a quiz written and conducted by Port Talbot members R. Cotton and T. Edwards. Port Talbot were the winners in a closely fought contest.

The month was rounded off with a visit to the C.N.A.A. National Fish Show at Cardiff,

where the club distinguished themselves by winning the trophy for the club with the most points in the show. Club member Miss C. Ruppert also took the trophy for the most pointed individual.

AT the August meeting of **Brighton and Southern A.S.** there was a discussion on the open show and exhibition which had been held on the previous Sunday. There was also a table show which was judged by D. Lambour. Results were as follows:—Seated Pairs (Livebearers): 1, Mr. and Mrs. Smith; 2, E. and T. Tester; 3, Mr. and Mrs. Sayers; 4, Mr. and Mrs. Hooper. Seated Pairs (Egglayers): 1 and 4, Mr. and Mrs. Houghton; 2, Mr. and Mrs. Rooney; 3, Mr. and Mrs. Sayers. Coldwater: 1, Mr. and Mrs. Sayers; 2, Mr. and Mrs. Ramshaw; 3 and 4, Mrs. P. Box. A.G. Furnished Aquarium: 1 and 2, Mr. and Mrs. Ramshaw; 3, K. Box.

THE August meeting of the **Rhondda A.S.** (C.N.A.A., F.B.A.S.) was attended by thirty members and visitors and after the usual preliminaries a quiz organised by G. Legge was held. This was won by the "A" team captained by D. Richards in an exciting contest with the "B" team by 145 points to 134. In the marathon well-supported table show was being judged and the results were as follows: Malawi: 1, P. and V. Watts; 2, M. Thomas; 3, G. Legge; 4, M. Parsons. Koi: 1, P. and V. Watts; 2, 3 and 4, M. Thomas.

THERE was a record entry of 714 for the **Stroud and District A.S.** open show, the results being as follows:—Stroud A.S.: E. Jones, one second; D. Capper, one fourth; A. Hodges, one third; J. Cole, one second. Cotswold A.S.: P. Lusty, one second; K. Hodges, one fourth; Mr. and Mrs. Hodges, one third. Nailsea A.S.: J. Dibble, two firsts, one second, one third, two fourths; P. Fitchett, one third; D. Kenwood, two firsts, two thirds. Newbury A.S.: K. A. Hillier, one second; P. Cripps, one third; R. J. Canning, four firsts, one second, two thirds. Evesham A.S.: Mrs. Wing, one third; R. Wing, one first, one second, two fourths; G. Ludlow, one third. Port Talbot A.S.: C. Morrison, two firsts, one second; Miss C. Ruppert, one first, one fourth. Merthyr A.S.: Mr. and Mrs. Parry, one first, two thirds, three fourths; R. Bennett, four fourths; Marilyn Davies, three second, one third; B. Bose, four seconds; Mrs. Morgan, one first. Newport A.S.: M. Addicot, one first, one second. Bath A.S.: D. and R. Clark, two seconds, one fourth; N. Pethecary, one third; S. Owen, two thirds; D. Sullivan, one first. Yate A.S.: R. Poci, one second, two fourths; R. Bennett, one fourth. Bristol A.S.: C. Cowle, two seconds; L. Littleton, one first, one second, one third, one fourth; V. Cole, two firsts, two seconds, one third, one fourth; Mrs. Pedersen, one second. Rhondda A.S.: M. and A. Smith, one third, one fourth. Sudbury A.S.: S. J. Bartlett, one first, one second; P. Moye, four firsts, two seconds; C. J. Richards, two firsts, one third. Basingstoke A.S.: J. Jackson, two firsts, one second; M. Strange, two firsts, one second; T. Fraser, one second. Delton A.S.: S. Wood, one first, one fourth. Loughborough A.S.: A. Onslow, two firsts, one third, one fourth. Malvern A.S.: J. Walton, one third, two seconds. Kidderminster A.S.: A. Howard, one second. Gloucester A.S.: D. Parry, one first, one second, one third, two fourths; R. Freshney, one fourth; M. Freshney, one fourth. Reading A.S.: M. Dore, one second, one third, one fourth. Whitehouse, one first, one fourth. Whiteway A.S.: K. Daniels, one second. Rubery A.S.: J. Malloy, one first, Whitefield and Smith, one third. Leamington A.S.: Mr. and Mrs. Chamberlain, one second, one third. Devizes A.S.: M. Brown, one first, one fourth. Trowbridge A.S.: M. Butcher, one second, two thirds, one fourth.

MEMBERS of the **Mid-Sussex A.S.** were asked recently for any suggestions as to what they would like to see on next year's pro-

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gramme, and have been invited to submit any ideas to the committee. The children's party, which is held annually, will this year, be on Saturday, 4th December. Again members were requested to put forward their ideas for the 'tableau' and it should be well noted that help will be needed at the actual show.

THE Brighton and Southern A.S. are arranging for a coach to go to the Federation of Northern Aquarists Societies Exhibition, at Belle Vue, Manchester, on Saturday, 23rd October. Any M.S.A.S. members who are interested in going, please contact N. Short. Mr. Bartles, who was the speaker, outlined the ways in which one begins to show fish, and how knowledge widens with experience. Results of the table show, which was judged by B. Slade, were: A.O.V.: 1, S. Bartles; 2, E. and T. Tester; 3, A. Temple. Marines: 1, N. Short; 2, Mrs. Shankland; 3, J. and B. Bartles. Further information may be obtained from the secretary, B. Slade, "Sundown," Bolney Road, Anstey (H. Heath 53747).

FRANK C. TOMKINS

WE understand that Frank C. Tomkins, chairman of the Federation of British Aquatic Societies recently suffered a severe heart attack and will be unable to keep his engagements for some time. We take this opportunity to wish Frank a speedy recovery and look forward to seeing him in action once again in the near future.

MEETING DATE CHANGE

FUTURE meetings of the **Llantwit Major A.S.** will be held on the second Monday of the month, at the Red Dragon Club, St. Athan.

SHOW SECRETARY CHANGE

Southend, Leigh and District A.S.: A. J. E. Smith, 39 Willow Walk, Hadleigh, Essex SS7 2RW, Southend 555540.

SHOW CANCELLATION

THE Fur, Feather and Aquaria Show which was to have been held on the 27th November, has been cancelled due to extensive repairs to the building.

AQUARIST CALENDAR

2nd October: East London Aquarists and Pondkeepers Association annual show breeders, to be held at Ripple Road School, Barking. Entry forms can be obtained from Mr. J. London, 41 Maybank Avenue, Hornchurch, Essex.

2nd October: Goldfish Society of Great Britain, Open Show, to be held at Wimbledon Community, St. Georges Road, S.W.19. Schedules from G. E. Herring, 94 Penwith Road, S.W.18.

3rd October: Newbury & District A.S. Fourth Annual Open Show at the "Plaza," Market Place, Newbury. Schedules and full details from Mrs. S. Canning, Show Secretary, 6 South End, Thatcham. Tel: Thatcham 64254.

3rd October: Eboracum Aquarists Open Show at Nunthorpe Grammar School, Scarcroft Road, York.

10th October: South Leeds A.S. Open Show to be held at Hunslet Boys Club, Hillside Road, Leeds 10. Benching 12 noon to 2 p.m. Schedules from Mr. A. Austwick, 151 Throstle Road, Middleton, Leeds 10. Tel: Leeds 703149.

10th October: A. A. Jones and Shipman A.P.S. First Open Show will be held at their Works Canteen, Watergate Lane, Leicester (1/2 mile from M1 Junction 21). Benching 11.00 a.m.-1.30 p.m. Schedules now available from Mr. M. Braimbridge, 123 Martin Street, Leicester. Tel: Leicester 667319.

10th October: Hartlepool A.S. Open Show at Lonscar Hall, Seaton Carew, Hartlepool. Further details from Mrs. A. Lion, 1, Loyalty Court, Hartlepool, Cleveland.

10th October: Immingham A.S. first annual show.

17th October: Torbay A.S. annual Open Show at Torbay Chalet Hotel, Marldon, Paignton. Schedules from Mr. J. R. Davis, 43, Haldon Road, Torquay, Devon.

17th October: Sunday—Midlands Aquarist League, six class open show, Bulkington Parish Hall, Bulkington, Nr. Nuneaton. Details C. Chamberlain, 2 Stanley Court, Sydenham Drive, Leamington Spa. Tel: 28957.

23-24th October: British Aquarists' Festival Silver Jubilee, Belle Vue, Manchester. Further details shortly. See display advertisement pages.

31st October: Doncaster & District A.S. Open Show. Benching 12 noon to 2 p.m. (Note change of venue) The Carcroft Miners Welfare Hall, Carcroft.

7th November: Halifax A.S. Open Show at The Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Details from D. Shields, Cobblestones, Gainest, Kings Cross, Halifax. Phone Halifax 60116.

14th November: Bradford & District A.S. Open Show will be held at Textile Hall, Westgate, Bradford. Details from show secretary J. Cornforth, 15, Weymouth Avenue, Allerton, Bradford, W. Yorks.

20th November: Goldfish Society of Great Britain. General Meeting 2 p.m., Conway Hall, Red Lion Square, London, W.C.1.

27th November: Fur, Feather and Aquaria Show, King's Hall, 39 Lower Clapton Road, London E.5. Schedules from Sybil Hedges, Kot Korner, 150 Ashburton Ave., Seven Kings, Ilford, Essex IG3 9EL. Tel: 01-590 3239.

19th December: Village Bae A.S. open show, Birmingham. Details from show secretary, 81 Barton Road, Oldbury, West Midlands B68.

THE AQUARISTS' BADGE



Re-introduced in response to numerous requests this attractive metal badge, which has a brooch type fitting, depicts an angelfish and a goldfish in silver on a blue background with a red surround bearing the words *Aqua cunae vitae ager nobis* ("Water is the Cradle of Life and the field of all our Endeavours").

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