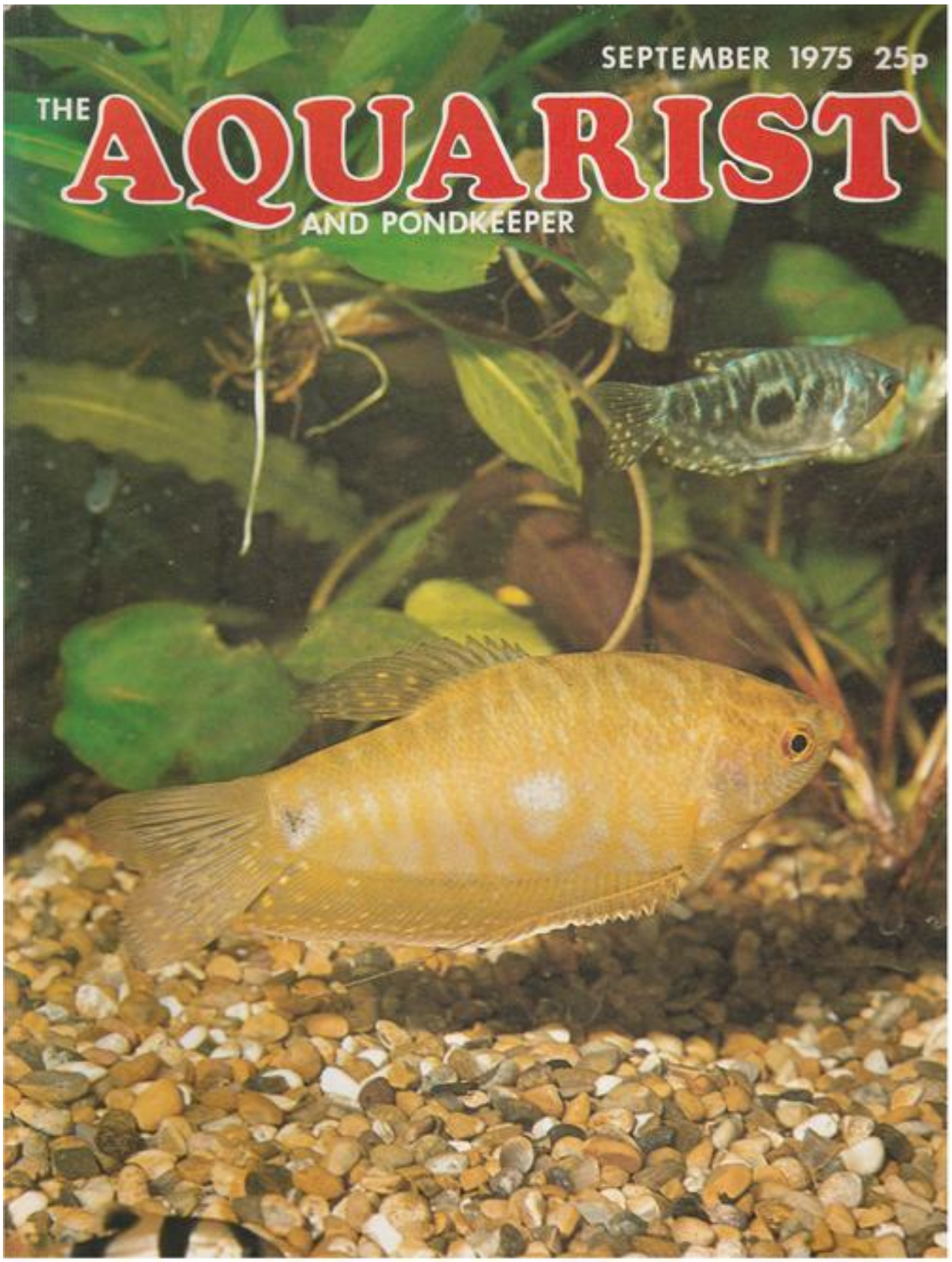
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THE
AQUARIST
AND PONDKEEPER

THE AQUARIST AND PONDKEEPER

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Our Cover:
Golden Gourami.
Courtesy of the Highgate Aquarist.

SYMBIOSIS
and *Amphiprion* species

by Steve Foley

THIS special relationship between *Amphiprion* spp. (clownfish) and anemones has been observed by marine aquarists the world over, not only with our lovable common clown, *Amphiprion percula*, but also with many other species of clowns.

SYMBIOSIS: is the name given to the living-together of two dissimilar organisms. This living-together can be of three kinds:—

1. Mutualism—where both partners gain.
2. Commensalism—where one partner gains and the other is unaffected.
3. Parasitism—where one organism gains to the disadvantage of the other.

The symbiotic partners are called SYMBIONTS.

It is my opinion that the relationship between *Amphiprion* spp. and anemones is a mutual one where both partners gain by the arrangement.

It is the purpose of this article to give personal observations leading to this view and also to give an explanation as to why and how the clown fish gain immunity to the anemones' stinging cells (nematocysts). The immunity theory is the result of many personal observations with several species of clowns and anemones. Concrete proof, by way of high magnification slow-motion film, is required to remove all doubt and I await the time when someone researching this subject at one of the universities will have the necessary equipment and techniques available to substantiate what I believe.

Several other creatures live in association with anemones, e.g. *Dascyllus*, crabs, hermit-crabs, shellfish and shrimps, probably others too that little or nothing is known about.

Whilst readers will, no doubt, visualize all manner of creatures living on, under and around anemones, all will probably be surprised to learn of ½ in. diameter bean-like creatures living *INSIDE* a *Radianthus* anemone I once had.

These creatures could often be seen to travel up and down the anemone's tentacles when fully expanded. This anemone was killed by a banner fish (*Heniochus acuminatus*) and, at the time, I did not think to open up the anemone to examine the creatures living in it.

With regard to the symbiotic relationship between *Amphiprion* spp. and anemones, the following observations should prove that clowns are not immune to the nematocysts by virtue of their birthright nor, I believe, are they protected by any built-in, or generated, defence mechanism. Four *Amphiprion percula* from Singapore, which had been quarantined away from anemones for several weeks, were placed into a 12 gallon tank containing a quarantined 12 in. diameter Philippine anemone with a red base and long thick brown tentacles. Within minutes the clowns approached the anemone, only to be stung as evidenced by the way they jumped clear after contact. The clowns made contact with the tentacles at intervals of about 5 minutes and each time contact was made a clown was stung. The belly portion most frequently came into contact during this procedure, which lasted for several hours. Also, the clowns were seen to rub some of the anemone's slime on to their own bodies. This action has also been observed with other *Amphiprion* and anemone species. Next day all the clowns were swimming in the tentacles with complete immunity.

It is my belief that when clown fish are removed from their host anemone they quickly lose their immunity to its sting—the exact duration of their immunity I have not determined. Frequent contact between clown and anemone for very short periods is then required to re-establish immunity. When the clown's body is sufficiently coated with anemone mucus contact between clown and anemone gives the anemone the same response it receives when one tentacle brushes another and, in this case, the anemone's nematocysts are not discharged. The fact that the clowns can withstand the anemone's initial stings I put down to the fact that the clown fishes' skin is extremely tough and well-scaled which aids the picking up of the anemone mucus and its adhesion to the body of the fish.

It is interesting to note that clowns which have died whilst away from anemones are quickly enveloped when dropped into an anemone's tentacles.

Two days later the four *A. percula* clowns, referred to earlier, were placed into my living room aquarium which at the time only contained four anemones: one yellowish green *Stoichactus giganteum*, one lavender and white anemone with a red base from the Philippines (perhaps *Tealia coriacea*), one pink *Radianthus malu*, one white *Radianthus malu*. Since the four

clowns came from Singapore, it is unlikely that they had ever made contact with any species of anemone, other than *R. malu*—their native host anemone. This being the case, they were faced with three alien anemones, counting the brown one in the 12 gallon tank, to which they became immune, and two familiar anemones. For several hours the clowns ignored the four anemones. One clown then ventured into the large white *Radianthus malu*. There were no sudden jolts and the clown slowly investigated its new host. Thus, the immunity derived from one anemone (the brown Philippine one) held good for another species, although they were both probably *Radianthus*. Gradually the clowns investigated the pink *R. malu* and the lavender Philippine anemone. Once again, the clowns received no jolts. We now have the immunity from one being good for three different species.

However, one of the clowns was seen to lightly touch the *Stoichactus giganteum* and it nearly jumped out of the tank in response to the nasty sting it must have had! Here we see that in this case the *Radianthus* immunity does not hold good for the *Stoichactus*, perhaps the reverse is also true, but this I have not verified. It would appear from photographs in magazines that *A. percula* do inhabit *Stoichactus* anemones, but perhaps only if alternative hosts are not available.

Almost immediately, two of the clowns paired off and occupied the largest white *R. malu*. The female of the pair began to harass the largest of the two unpaired fish, probably another female, which a few days later was found dead, and the remaining unpaired fish—a male,—was banished to the opposite end of the aquarium where the *Stoichactus* had settled. Due to the aggressive nature of the paired clowns, the lone fish was forced to seek refuge in the only place it could be safe—in the *Stoichactus*. It was, therefore, only a matter of days before the lone clown was bathing in the Stoichactus's tentacles with complete immunity. This was achieved by intermittent contact, as previously described. This particular clown also maintained a relationship with the lavender anemone which was nearby.

Therefore, it would appear that immunity to anemones of different genera, as well as several species in a genus is possible, although, as we have seen sometimes, acceptance of an alien anemone has to be forced upon a clown. Frequent contact between different genera, as with *Radianthus* and *Stoichactus*, must be maintained if the immunity is to be held.

Readers will, no doubt, be interested to learn that the paired clowns have now spawned 31 (thirty-one) times, averaging approximately 10 days between spawnings, and that I have raised 5 *A. percula* clowns which are now over 7 months old.

Why do *Amphiprion* and Anemones live together?

Amphiprion **gain:**

1. Protection—from enemies that are not immune to anemone's sting and perhaps protection from powerful currents at certain times of the year.
2. Tactile stimulation—they just enjoy the feel of an anemone on their bodies.
3. A soft resting place and a bed.
4. Nourishment.

(a) Fry

Having bred clowns in captivity, I can write with a little authority, but since I have never seen fish on the reef I can only assume the same applies, but the latter does not concern aquarists anyway.

Amphiprion percula fry do not approach anemones immediately they are born and it is 12 to 13 days before they take the plunge. They do not appear to be stung and intermittent contact does not appear to be necessary. This is perhaps due to their small size, contact not being sufficient to trigger off the nematocysts. Thus, a mucus coating can be obtained without being stung. The fry are quite obviously afforded considerable protection by the anemone, but also the fry are sometimes seen to nibble at the anemone's body and tentacles. Because of the mucus, it would seem reasonable to assume that small particles of food and minute living creatures will be trapped, giving the fry an easy meal. Also, the ejected anemone waste may provide small amounts of food and even the anemone tissue and tentacle tips may provide valuable protein for hungry fry.

(b) Adults

Once again, ejected anemone waste which often contains amounts of undigested food can provide a titbit for a hungry clown. Also, I have seen clowns nibbling tentacle tips and even sucking them. Perhaps the *Amphiprion* are able to suck out anemone body fluids in this way and thus provide a valuable snack. On one occasion, the male of my breeding pair was seen to bite off a whole 2 in. tentacle from the lavender anemone and completely eat it! The surprising thing was that the anemone did not respond in any way to this amputation.

A theory once put forward that anemones can remove oodinium and other parasites from *Amphiprion* is most definitely incorrect, especially so in the case of oodinium. A sure way of killing oodinium on fish is with copper-based remedies, usually containing copper sulphate. N.B. fish must always be treated away from invertebrates. (One product not containing copper and which is safe with invertebrates has recently been marketed).

Anemones gain:

1. Food—as clowns' left-overs and also they are deliberately fed by clowns when food is abundant.

Whilst I have had *Amphiprion* feeding anemones to the point of ramming lumps of prawn into the anemones' mouth, I have had the extreme case where food placed into an anemone (*other than the host anemone*) has been removed and dropped onto the sand to rot.

2. Stimulation—This is difficult to assess, but is a possibility.

3. Waste removal—Ejected waste can sometimes foul the anemone's tentacles, but when clowns are present it is quickly wafted away by rapid movements of the caudal fin.

4. Protection—Although the anemone protects the clowns against fish-eating creatures, the clowns protect the anemone against anemone-eating ones, such as butterflies, angels, starfish, snails, etc. Often it will take a whole family of clowns to protect their host against an enemy.

Recent reports indicate that *Amphiprion* spp. in some of the best collecting grounds are acquiring a cave-dwelling existence, due to extensive anemone removal by collectors. We could see the day in the very near future when anemones and *Amphiprion* spp. are relatively scarce, so PLEASE look after your livestock—it may one day be impossible to replace.

THE SHEDD AQUARIUM

by Mike Lloyd Williams

THE WORLD'S biggest aquarium looked in great shape when I and scores of instantly-awed other visitors popped in there on May 7, 1974. The awe starts the moment you step past the friendly ticket barrier of the late John G. Shedd's octagonal marble Doric aqua-temple on 1200 South Lakeshore Drive, Chicago, alongside the great Lake Michigan that supplies its freshwater tanks.

For the centrepiece of the entire 300 ft diameter building is something that puts humans out of their element and, by illusion, right in there with the fish: the giant Coral Reef marine tank studded with 1,000 colourful Caribbean fish of over 75 species against a background of corals, sea fans, sponges and sea whips demonstrating the inter-relationship of varied life forms on a reef.

Once a day, an unenvied diver goes in to hand-feed the lot—including barracuda, nurse sharks and green moray eels. Friendlier specimens in the same tank are angels, damsels, schools of chub, grunts and spadefish, loggerhead and hawksbill turtles as big as coffee tables, triggerfish, Nassau groupers, striped burrfish, tarpon and porkfish.

Recorded commentary—with sea-music accompaniment—and graphics, give you scientific names, classifications, distribution and habits; the lighting system, suspended above this bungalow-sized tank, gives a daylight-sundown-night-time sequence. This Colossus of aquaria cost a mind-boggling 1·2 million dollars and is the first major addition to the building since it first opened publicly in 1930 to start welcoming up to 78,658 people in a single day.

That doesn't mean, though, that the coral reef makes everything else here look like grandad's old gas-heated community tank. The designers of the whole place were ahead of their time—and the grand total of aquatic specimens on display is over 7,500, representing 350 species, housed in 204 other tanks—most of them concrete—with a gallon capacity of up to 13,500 *each*.

Take the six main galleries, for example, each 90 ft long by 30 ft wide, total capacity 450,000 gallons. Irresistible exhibits include Chico, the freshwater dolphin; six-foot-plus examples of the piraruca (*Arapaima gigas*) and arowana (*Osteoglossum bicirrhosum*) from South America; sturgeon and shark that dwarf even them; and what you could call the "oddities" displays—of archers, crustaceans, lungfish and Nigerian rock skippers, each curiosity getting the most perfect captive environment possible to encourage its unique characteristics. The piranhas were almost grinning about the space they had, and here in the galleries no fewer than 95 tanks are constantly in reserve.

Shedd's octopus and alligator-snapping turtle must be among the biggest in captivity—rugby-ball-sized and dust bin-sized respectively; the moray eel selection among the finest (green, Californian, Common Hawaiian, polka-dot, speckled and white); and the smaller marine tropicals like tangs and triggers among the healthiest.

How Shedd got its seawater and collects its specimens isn't for the amateur.

It took 160 railroad car loads all the way from Key West, Florida, to fill the four aquarium reservoirs, which together with fresh lake water—the more accessible kind—hold two million gallons. And the aquarium's own safari Pullman car, the Nautilus, does up to 20,000 miles a year with its live-in crew of six.

Pumping, plumbing, purity and temperature control would need an article of their own. Briefly, the way

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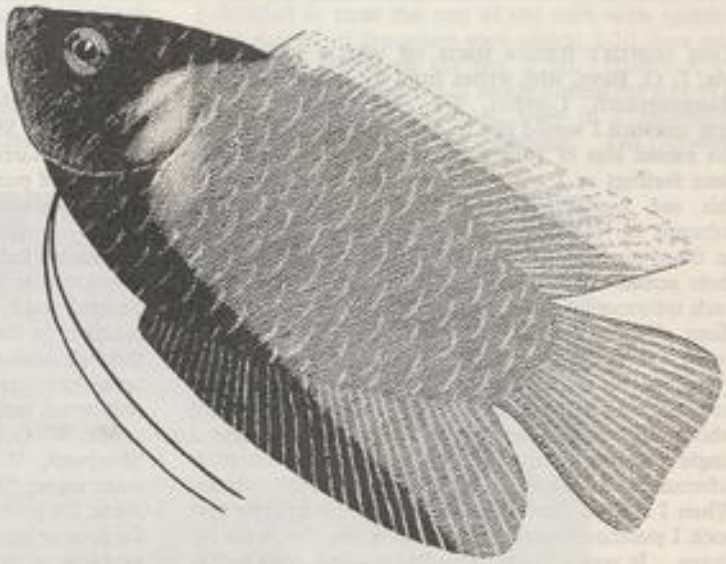
THE HONEY DWARF GOURAMI

by
Bill Simms



MANY of the Anabantids are decorated with metallic scales in bands, and therefore are extremely handsome. *Colisa chuna*, the Honey Dwarf Gourami, is without this metallic glint, and yet is quite handsome. The light part of the body is coloured like honey with a reddish tinge, the dorsal of the male has a fringe of golden yellow, while the face and lower body is bluish-black. The effect is almost as attractive as that of its similar-sized cousin, the Dwarg Gourami.

This fish comes from India, and reaches a length of about 2½ inches. It is rather shy and prefers the company of its own kind, but can be kept in a community tank for it is less aggressive than other anabantids. The water should be slightly acid and soft with a temperature above the usual 75°F, ranging up to about 82°F.

Breeding this fish is somewhat easier than the ordinary Dwarf Gourami because of its more peaceful habits. Instead of punishing the female if she is unwilling to spawn, this little fellow uses persuasion and achieves results just as good—with less damage to the female.

When building its bubble nest at the surface the Honey Dwarf Gourami will incorporate small floating pieces of vegetable matter in the nest but can manage with very few pieces. I usually add just a small patch of riccia, and some is used. The nest is wide and fairly solid, and when completed the female is enticed below and is squeezed in the normal gourami fashion.

After the spawning is finished I remove the female, but not for her protection. It seems safer for the fry when they hatch. The male, as is usual with anabantids, tends the nest with more bubbles and when the babies emerge shoots them back into the nest with more bubbles when they stray. Eventually too many youngsters are emerging at the same time and he tires of his job. Then I remove him, too.

Spoonfuls of rich infusorian water are fed to the fry until they become big enough to take newly hatched brine shrimps. This kind of gourami prefers crustaceans to all other live foods, and I have used the freshwater shrimp, *Gammarus pulex*, to feed the adults, as well as bits of frozen shrimp. Like most kinds of tropical fish, this one does far better on live food than on dry, and I have found the reddish tinge of the body colour will brighten considerably when shrimp is provided consistently.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A.

Photographs by the Author

THIS MONTH'S feature starts off with a letter from Mr. I. G. Bave, who writes from 87 Aspen Gardens, Hammersmith, London, W6. He states: "In the first instance I would like to commiserate with you on the recent loss of your gouramies. I can appreciate your feelings as I am afraid we have all experienced this sad business at one time or another. The columns of *W.Y.O.?* are, in my opinion, invaluable. In them we have letters from hobbyists writing from their actual experiences, and quite happy to pass on such information. Experience is the finest teacher of them all; theory, often contradictory, is alright in books. I well remember many years ago a friend of mine, in the publishing business, telling me of two 'experts' who had written a book on tropical fishes and who at the time of writing the book had not kept a single fish between them; they had obtained their information from books already written on the subject. When I started the hobby some 20 years ago the first book I purchased was entitled *Aquariums*, by Anthony Evans. It was a Foyles Handbook—and even today, if still available, would be very helpful to the beginner. It contains approximately 30 good photographs and many line drawings of fishes and plants. The text contains some excellent advice and information." (I think the book, written by Mr. Evans, a former Editor of this journal, is still available).

Mr. Bave continues: "I have recently been plagued with algae on my plants in one of my tanks. After using Acurel F, as instructed, for the past three weeks, the problem is still not solved although the tank water is very clear." (I suggest you try Algo-Stop for getting rid of algae.) "I have a Uno thermostat with neon light that has never gone off since I installed it some months ago. The temperature has kept at a steady 75-76° so it must be working okay. Any ideas? I do wish all manufacturers advertising in *The Aquarist* would include the retail prices of their goods. It's amazing the difference in prices charged when shopping around. I think I must have saved myself £s by doing that. Some time ago I wanted a Gem tank; I was quoted no fewer than four different prices. In September of last year a Windmill air rejector was purchased and I decided to purchase a separate pump to work it. In *The Aquarist* the Golden Bell pump was advertised by one shop at £2·15. I purchased one through a mail order firm for £1·20 including V.A.T. and p. & p."

No. 1 Millfield Road, North Walsham, is the address from which Mr. K. Mason writes. "The remarks of Mr. G. Harrison, in the May issue, regarding the practice of putting Siamese fighting fish in jars so that they constantly display—regardless of detriment to health—reminded me of a visit to the exhibition at Alexandra Palace where I was surprised to see these lovely fish in adjacent small tanks, with similar effect. Several had even assumed a completely cowed position in the bottom of their little tanks—possibly through exhaustion. May I suggest that in future these tanks have cardboard dividers between each, removed only when judging takes place."

Mr. W. G. Turner's home is at 9 Blenheim Road, Sherburn, Watlington, Oxon. He writes, on the same topic: "With regard to Mr. G. Harrison's letter about his problem with fighters, I have kept these fish for four or more years and have never experienced this problem to date—or for that matter, never seen them in such poor condition in the shops. I would suggest that he goes to a shop that only sells quarantined fish as I think this is what's wrong with the fish he writes about, rather than the fact that they are kept in jars. In my experience the male fighter, as a rule, does not dash itself against the side of the jar but merely flashes his fins, shows his gills and generally shows off in an attempt to intimidate any other male fighter he sees. In my opinion the transportation of this fish is no problem provided it is packed properly and not bumped about. My own fighters have travelled all over the south and even as far as Manchester—B.A.F. Show—and have won and been in the cards on numerous occasions—in the show jars, next to each other, with no ill effects. These are usually bought as adults and live in my 4 in. × 4 in. show jars for an average of 18 months from the time I buy them.

"On the subject of hatching and serving brine shrimps, I hatch mine in a small plastic funnel that holds a pint. There is an air line fixed to the bottom and the funnel is attached to the side of the aquarium by means of a rubber sucker. I use three teaspoonfuls of salt to a pint of water. To serve them I siphon them out with a 9 in. length of air line with a rubber bulb shaped squeezer on the end. The shrimps are

washed in a fine sieve and then fed to the fishes. Ref. fish showing: I do show fishes and get a great deal of satisfaction when they win or get placed—or even if they get good marks. I belong to Basingstoke A.S. and show under F.B.A.S. rules. This Federation judges all fishes benched so you can tell how well your fish did even if it's an also ran, and you can find out a fish's failings. One of the best things about these shows is the friendly atmosphere and also the amount of friendly advice given. I am convinced that fish shows do as much if not more for the hobby than any other single factor."

Having quoted a couple of letters about Mr. Geoffrey Harrison's last letter, it's time to allow him to make a few more comments himself—and this he does from his home at 4 Teignmouth Gardens, Perivale, Greenford, Middlesex. He writes: "Thank you for printing my letter regarding the keeping of male Siamese fighters. On reading my letter in print I fear I may have been somewhat melodramatic in sharing my opinions. Although I would still welcome any advice from *Betta* experts I am glad to say that since last writing I have purchased another male fighter which is now doing well. Although not unduly aggressive he is the boss of the tank and spends a lot of his time keeping the female in her place. I was interested to note that you had an outbreak of white spot in your discus tank and treated it with a preparation of malachite green. Over the period of treatment you say you lost several small tetras and suspect the 'cure' as the cause of these deaths. You may remember a letter from a young man, in the September 1974 edition, telling how he treated one of his tanks with a preparation and lost 72 fish, mainly home bred. This preparation states specifically that its active ingredient is malachite green. I myself lost 6 neon tetras when I treated them with Magicure. I must confess I gave the neons the full recommended dose for 'normal' sized fish; but it does state that the half dose, i.e. 1 drop per gallon, be used for small fish. To refer to Van Duijn again, he states that one must be very careful with malachite green since it is very toxic in overdosage. He personally prefers less harsh 'cures'—such as methylene blue. After having lost these neons I decided to treat the rest of the tank with quinine. This got rid of the white spot within 7-10 days with no adverse effects on the fish at all. However, the plants, which had settled in nicely during the month or so after setting up the tank, were in a disasterous condition as a result of the treatment. The *Cabomba*,

Vallisneria and the *Aponogeton* were completely wiped out, whilst plants like *Hygrophila*, Amazon swords, wistaria and *Bacopa* suffered only a slowing up in growth. I had read about three books recommending quinine as a treatment for white spot; and two of these said that quinine would not harm the plants; whilst the third merely stated: '. . . may affect plant growth . . . So having no other tank at the time, except the 2 gallon one I used to treat the neons, I went ahead with the quinine treatment and suffered the consequences. A month or so later, after some cleaning up and a minor water change, I let the charcoal filter take care of the rest. Some of the *Vallis* shot up again and even sent out one or two runners. The *Aponogeton* species came up again and one even flowered; but the plant growth was never really the same again.

"This tank, in fact, is the one I had the blue/green algae in. The algae have now disappeared since I

reduced the light and added some Chloramine-T. However, I will bear in mind your suggestion of Algo-Stop if I have any further trouble. I might add that before the trouble started, the plant growth was very pleasing. The *Vallisneria* seemed to be sprouting runners occasionally. All plants, especially, the *Cabomba*, had rooted well. The tank, which is 26 in. × 16 in. × 12 in. high, was lit for about 10 hours per day with a 24 in. × 20 watt 'natural' fluorescent tube. The water temperature was about 75°F and 16°DH, with a pH of about 6·8. It may seem strange that such hard water has an acidic reaction, but this is the case and may account for the fact that such water will grow *Cabomba*, *Aponogeton* and the like.

"I have also recently set up another tank of similar dimensions, lit by a 20 watt 'warm white' tube, The plants consist of *Cabomba*, *Bacopa*, Indian fern, hair-grass, *Cryptocoryne* and lots of *Vallisneria*—both straight and twisted. All plants have rooted well and the *Vallis.* are pushing out runners all over the place. I noticed that you once said that you had difficulty with *Vallisneria* in a tropical aquarium. I gather they like rather hard water, which is well provided for in the Greenford area. Perhaps the water in your area is soft?" (I can confirm that the water in my area is soft and very slightly alkaline.) "... I have a friend who has just set up a brackish water community aquarium. The tank is 20 in. × 13 in. × 12 in., and the water, which is maintained at 75-77°F, contains about 1 teaspoonful of aquarium salt per gallon. Though plants may not be suitable for a brackish tank, she is trying one or two specimens of *C. ciliata*, *Samolus* and some *Bacopa*, which were suggested by a dealer as being most likely to adapt to these conditions. She would appreciate any suggestions from brackish water experts on the maintenance of such a community, and on the plants, if any can be successfully cultivated in it. The fish population so far consists of 2 *Monodactylus argentus*, 2 puffers, 2 scats and 3 bumble bees, all of which are young specimens of 1-2 in. long. I would like to add also that the tank is an all-glass one which, like my own, I made myself; hence no trouble is to be expected from metal in contact with salt water.

"With regard to growing wistaria, the specimen I obtained from Hobby Fish was planted in about 2 in. of gravel after cutting off excess stalk at a node. It soon produced aerial roots which found their way into the gravel. It grew quite rapidly under the 20 watt fluorescent 'natural' tube and had to be pruned a couple of months later. The pruned piece was planted at the back of the tank where it also took root. As I said, the water here is hard and acidic, and one source of information tells me that wistaria prefers water on the hard side. A summary of the conditions would be: light—20 watt 'natural' fluorescent; tank-depth—12 in.; temperature—75°F; pH 6·8; DH 16°. All in all it proved to be a robust, undemanding plant, and a strong grower—that is, until the blue/green algae got to it. However, all is not too bad now.

Young plants of Java fern.

The next letter reached me from Mr. P. W. Neville, who resides at 1A Allandale Crescent, Potters Bar, Hertfordshire. He tells us: "I was running an apparently happy community tank of 24 in. × 12 in. × 12 in. containing neons, zebra danios, *Melanotaenia macculloch*i and *M. nigrans*. The last two are the dwarf rainbowfish and the Australian rainbowfish, and were identified from Hervey and Hems. Suddenly

disaster struck and all at once the following symptoms presented themselves: fin rot, pop eye, bent spine, loss of appetite, and inactivity at the water surface. Therefore I assumed *Ichthyopthirius* or tuberculosis was responsible; and certainly all attempts to cure have failed. The most obviously suffering fishes had to be killed; and from a colleague at her work my wife learned of the following technique: drop fish from net into pan of boiling water. My experience, though limited to fishes under 2 in. long, suggests this to be quite instantaneous and suitable for squeamish persons like myself. Incidentally, as an indestructible fish I recommend *M. nigrans*. Mine are still in apparently robust health despite the sickness and fatalities around them." (Photograph 1 shows *M. nigrans*, the Australian rainbowfish).

The subject of aquatic plants is one that is possibly closer to my heart than that of fishes. I feel that an aquarium without plants is like a room without furniture or furnishings—it can be lived in but it presents a very bleak internal environment. Of the many tropical aquatic plants which I have kept over the years few if any have given me as much pleasure as the Java fern, *Microsorium pteropus* (Photograph 2). Although the plant is not a fast grower when compared with commoner species, it makes steady progress and will eventually produce a virtual forest of delightful foliage—given suitable conditions. And I know of no plant that can so easily adapt to a wide variety of environmental conditions as regards temperature and water. It does not need to be planted in sand or gravel and will happily attach itself to rocks or wood. Indeed I have frequently found young plants growing at the glass/glass joints or glass/metal frame joints in my aquaria. In all-glass tanks without rocks or gravel it can be weighted down easily with a few pieces of lead wire. Java fern is not at all fussy about light and seems to grow equally well with a little or a lot. Specimens can now be bought for about 30p—and if you have not already tried this species I suggest that you should do so. I doubt if you'll be disappointed!

Keith Sones is a teenager who lives at 34 Kingsway, Banbury, Oxon., and his subject is the plant *Nomaphila stricta*—commonly known as giant Hygrophila. Keith writes: "I find the easiest aquarium plant is gaint Hygrophila. About two years ago I bought one cutting from which I have propagated enough plants to fill my own three tanks and those of several aquarist friends. There are several ways of propagating this plant: it can be layered by holding down the stems on to the gravel with strips of lead; at every leaf joint a new plant will grow. Secondly, a leaf can be floated in the water until roots show, and then planted. Thirdly, the stem can be cut off as the plant grows too tall. A new shoot, or new shoots, will grow from the place where it was cut; and the cuttings can be planted in the gravel, where it will soon root. I find the last method the most satisfactory as it can be carried out in a community tank without making it look untidy."

Corydorus paleatus.

Although this is not the time of year when one normally thinks about power cuts and cold weather, these are worrying problems for which one should always be prepared when keeping tropical fishes. Mr. K. Page's home is at 68 Balfour Road, Preston, Lancs. Speaking of power cuts he says: "I decided to experiment before any such power cuts affected me and the results are as follows. I placed two mollies

and six guppies in a 24 in. × 12 in. × 15 in. tank when the water temperature was 80°F. I fitted a double layer of polystyrene ceiling tiles round the tank and covered the whole aquarium with brown paper. I then pulled the plug out and left them. I checked the temperature three days later and it was 76°F. The tank was again wrapped up and left. Exactly eight days after switching off the tank I removed the paper and tiles—to find my fish swimming around happily in a temperature of 63°F. I must point out that the tank looks very unsightly when wrapped, but I think you will agree it is worth it to save one's valuable stock. I hope my experiment will help other aquarists with power cut problems as I myself am no longer afraid of the threat of electricity loss." Referring to a letter written by Mr. I. D. Taylor and published quite some time ago in these pages, Mr. Page states: ". . . Mr. Taylor believes that to be successful in breeding neons you must rear at least 70% of the young. This only means that you are successful in breeding, and in rearing a lot of the young. I myself have bred and reared only about 45—but I consider myself successful in at least breeding neons."

Unfortunately Mr. Page's letter did not show the date on which it was written. Readers are reminded that letters intended for this feature should have the sender's name and address, together with the date of writing, PRINTED clearly on them—preferably at the top of the first sheet. All letters MUST be signed at the end. It would also be most helpful if contributors wrote on only one side of each sheet of paper used. Letters should be sent to me c/o *The Aquarist & Pondkeeper*, the address of which can be found at the top of the first page listing the contents of each edition. By following these simple instructions—and writing neatly—you can make my task easier and give your letters a better chance of being included in a future feature. Readers are reminded that I do not accept responsibility for, or necessarily agree with, the views and opinions expressed in readers' letters.

Photograph 3, which shows a *Corydoras paleatus* leads us appropriately to a letter from 24 Humphries Close, St. Cleer, Liskeard, Cornwall. Its sender is Mrs. Hazel Byford, and she states: "Ref. catfish breeding, I have 2 breeding pairs of *Corydoras paleatus*, all about one year old. They have both spawned several times and I have successfully reared the fry. The adults are in a tank 24 in. × 10 in. × 8 in. deep, and I keep the water fairly new by adding tap water. Plants are *Elodea*, Java moss and Amazon swords; and the temperature is 73°F. The fish behaved exactly as in the text-books, with the female clasping the eggs in her fins and sticking them round the tank; but I find that they are not fussy where they put them—on the glass, on leaves, on stones; and sometimes just dropping them on the gravel. I was lucky that some eggs were put on the front glass and was able to observe them under a magnifying glass several times for the six days before they hatched; and I could see the change and movement. I was lucky enough to see two fry emerge from their eggs; one dropped to the gravel, rather like a tiny grey tadpole. It was literally invisible in seconds. On two occasions I have seen a male 'pepper' catfish eat an egg from the glass side; although the books say 'No' I find that it is advisable to remove the adults when the young hatch as although they ignore them the buffeting of the wash set up by the big fish is too much; and the adults go for the brine shrimps before the fry realise they are there. I feed the young on fine flake food, crumbled Tetramin tablets and, after a few days, brine shrimps.

"The young grow fast and can soon take ordinary flake foods, white worms, etc. I have tried breeding albino catfish and bronze catfish but have had no success. I would like to hear from other successful breeders. . . . We hope to start an aquarists' society in this area shortly; it will be interesting to meet to talk and exchange views, although I'm not interested in showing fishes.

The use of common names alone frequently causes confusion amongst hobbyists—and most of us are guilty of "taking the easy way out" by using common names, when, with a little bit of extra bother, most of us could learn the scientific names of most of the common fishes and plants. The following letter, from Mr. G. Carstairs of 83 West Torbain, Kirkcaldy, Fife, highlights the problem of the confusion that can result when common names are used instead of scientific names. Mr. Carstairs writes: "In the June issue you are asked for opinions on growing Java fern (*Microsorium pteropus*). A number of weeks ago I purchased two portions of what was said to be Sumatra fern and, having two tanks on a stand in our sitting room, I placed one portion in each tank." (Sumatra fern, *Ceratopteris thalictroides*, is more commonly known as Indian fern; hence Mr. Carstairs' comments which follow refer, presumably, to *C. thalictroides*, and not to the plant *M. pteropus*, commonly known as Java fern, about which I asked.) Mr. Carstairs continues: "One tank was 24 in. × 10 in. × 10 in. and the other 24 in. × 12 in. × 12 in. Both have Rosewood U/G filters and internal box filters operated by a Rena 301—which I consider a good investment. The 24 in. × 10 in. tank is lit by a 15 watt Gro-Lux tube, and the 24 in. × 10 in. by a 15 watt Wotan tube. Although all other plants flourish almost equally well—including wistaria, about which you asked recently—the plant under the Gro-Lux has made 50% more growth. Perhaps your experts could give the reason for this, whether it be the different brand of tube, the 2 in. difference in tank depth, or something which I have missed. Both tanks run at 78°F and are filled with the same water. Still on the subject of plants, I recently set up a 24 in. × 12 in. × 12 in. tank with a 30 watt tungsten strip light. A

few *Hygrophila* were planted and grew almost as fast as I cut them back; but I find that they do not grow as well under fluorescent lighting. I hope the increase in postal charges does not put an end to W.Y.O.? as this would be a sad loss; the opinions and hints to be found in it are something I look forward to very much."

Graham Franklin's home is in Switzerland but he has been a boarder at Royal Russell School, Ballards, Addington, S. Croydon. Writing about the hobby in Switzerland he says: " . . . I find the service to be a little 'sloppy.' In the whole of Zurich I have found only three retailers and all of them are very expensive." Graham goes on to say that he feels that photographs in *W.Y.O.?* should be captioned as he finds it "a bit of a bother to have to read through the text each time I want to identify something shown in a photograph." Please send me your opinions on having photographs captioned.

Some time ago I asked for opinions on external thermostats. My request brought the following reply from Mr. T. S. Rainey, of 29 Lippincourt Road, Henbury, Bristol. "I use a Springfield external thermostat, paired with a 75 watt heater, for my 3 ft. tank, and have never had any trouble with it over the four years it has been in operation. I find there are many advantages to having this type of unit. One of the most important is that it is fitted with an earthing point. There is no hit and miss when it comes to getting the temperature you require: just switch on to maximum and wait until the water has reached the required level; then turn back the control knob gently until the neon indicator goes out. What could be simpler! There is no messing about trying to hide thermostat wires in the tank because they are easily hidden along the base on the outside of the tank. Some aquarists believe, as I do, that the easy way to cure white spot in an aquarium, when you haven't a spare tank handy, is to raise the temperature to approximately 90°F for 8-10 days. On an external thermostat this only involves turning the knob to maximum and that's it. If you try altering the normal, glass tubed thermostat like this, to get various temperatures, the chances are that you will end up with boiled fish or, worse still, a loose rubber bung or broken tube. For safety, simplicity and satisfaction you cannot go wrong with an external thermostat. I now await a *heated* argument with the glass 'stat brigade!' "

From 83B Totteridge Road, High Wycombe, Bucks., comes a letter from Mr. R. Lovell about methods of killing ailing fishes. He writes: "Unfortunately, twice recently I had this problem. With the first I tried to stun the fish; but it seemed a very unhappy way of doing things. The second fish I put into a saucepan, containing water, and heated it. I must admit that the poor fish continued swimming round until it finally stopped swimming and just quivered a second or so. It was quite rigid with all its fins extended. I understand that this immersion in cold water is the humane method for cooking lobsters and crabs and is an improvement on plunging them straight into boiling water as once the water temperature reaches 140°F the fish is stunned. However, I would like to think that there is a better method." (I'm one of those unfortunate people who doesn't like to kill living creatures; hence I wouldn't fancy either stunning or scalding a fish to death. I would tend to take the moral coward's way out and flush an ailing fish down the loo. Possibly this method is, in the long run, more cruel than either of the other methods listed. Surely there must be some chemical agent available that could be used to put an ailing fish to sleep permanently—without causing it pain. Does anyone know of a substance that could be used to produce euthanasia in ailing fishes? I'm sure that if some manufacturer were to produce such a proprietory product, for the aquarist, it would sell reasonably well. Have readers any suggestions for other new products that would fill specific 'gaps' in the hobby?)

For the past few weeks I have been trying to obtain a *true* pair of ½ black red tail delta guppies—but I have been unsuccessful in my search. If you specialise in this colour variety and have a true breeding strain, or if you know of anyone who does, I'd be pleased to hear from you.

For the November edition please send me your views and comments on the following, or on any other branches of the hobby that would be of interest to other readers: (a) Under what conditions have you successfully cultivated micro *Sagittaria?* (b) What is your favourite floating plant, and why? (c) How well have your water lilies bloomed this summer? (d) How has the exceptionally hot, dry and sunny summer affected your garden pond and its contents? (e) Please send me details of the conditions best suited to the cultivation of *Ceratophyllum* (hornwort); ditto for *Marsilea* (hairgrass) species. (f) I would like to hear of your breeding experiences with egglayers using boiled willow roots or nylon mops as spawning media. (g) Under what conditions have you bred the common goldfish, *Carassius auratus?* (h) What types of rocks do you use to decorate your aquaria, and from where do you obtain them? (i) How useful do you find the sucker catfish, *Otocinclus affinis*, for keeping a tank free from algae growths? (j) Are grindal worms still popular as a live food? If you use them please send me details of the method by which you cultivate them. (k) Please send me a few notes on how you've bred and raised any species of large cichlid. I look forward to receiving a good postbag as a result of the rather larger number of questions I've posed this month. Remember, you don't have to be an expert to be able and qualified to pass on interesting, original and useful opinions or information. I look forward to receiving a letter from YOU!

Live Foods for Fish

I would like to tell you about the way I feed bloodworms to my fish. I use a length of ¼-inch glass tubing. Placing your finger over one end of the tube, you then direct the tube over a bunch of bloodworms in their container, and lift your finger off. The rush of water up the tube takes the worms with it. All you have to do then is put your finger back over the end of the tube, and put the tube into the aquarium. With a bit of practice you can feed the fish individually, but usually when the fish become trained to feed from the tube (after about 2-3 days) a mass crowd of fish will gather at the tube, until you release the worms into the water. This method of feeding may take a little more time than just tipping the worms in, but is much more interesting, and also lessens the chance of worms burrowing into the gravel, so is well worth the effort.

Another good food that is plentiful during summer is Froghopper grubs (the little green things found in the so-called Cuckoo spit). These are eagerly eaten by most fish, the small young grubs can be managed by tetras and barbs, etc., and the large grubs are gulped down by cichlids, gouramies, etc. Have any other readers tried this food before?

PHILIP MCKIE,
6 Shortwood Avenue,
Hucknall,
Nottingham
NG15 6DA

Observations of Angel Breeding Habits

It is with respect to Mr. Hems and to Mr. Whiteside and their respective features in this magazine that I have chosen this section to air the following observations.

I cannot profess a lifetime's fish-breeding experience (I'm not that old) but I have bred several successive generations of Angel fish and it is on this experience that I base the following.

Preferring the natural selection method of pairing Angels, i.e. allowing them to grow-on together and eventually select their own mates, I have noticed:

(a) When a Marble/Silver cross is allowed they will pair and spawn much sooner than will Marble/Marble or Silver/Silver pairs of the same age.

(b) The Marble/Silver cross always pair-off as male Silver and female Marble. I have yet to record a *natural* pairing of male Marble and female Silver.

(c) If three batches of Angels of the same age, each comprising about 15 to 20 fish, are grown-on for future breeding pairs as (i) Marble and Silver mixed (ii) all Marble (iii) all Silver, the first spawnings always come from the mixed batch, followed by the Silvers, and it is not until much later that the Marbles decide to spawn.

I would be most interested to learn if this is considered a common occurrence, and if so the reasons for it. Having discussed these traits with fellow breeders in this area (especially item (b) above) and heard them speak of similar observations I cannot believe that it is just coincidental that the pattern continues to repeat itself.

P. G. WATSON,
Petnne,
31 Common Road,
Hemsby,
Great Yarmouth.

Appreciative Reader

I would like to express my thanks, through your columns, for the great help that Mr. Jack Hems and Mr. Boarder have given me in the past. I wrote a letter asking Mr. Hems for advice about Black Mollies. He sent me a two-paged letter, that seemed so friendly, that it appeared to come more from an old acquaintance, than a complete stranger. Mr. Boarder is also the same way when he replies.

Where else could you get such expert advice free, for the cost of a stamp? The Aquarist is lucky to have such people writing in its pages. Good luck to them both.

H. J. PRATT,
20 Shakespeare Square,
Ilford,
Essex. IG6 2RU.

Amphibious Guppy

I thought your readers might be interested in something that happened to one of my fish. After having come home from a fish show, the show-jars were emptied in the tank, and then put outside into the washhouse. The next day I noticed that a full-sized bottom sword guppy was missing. After a fruitless search I checked the jars and found the unfortunate fish on the bottom of a jar 4 in. by 4 in.

I have enclosed the amount of water that was in the jar. Fortunately the fish was still alive after 27 hours. Is this a record? Who needs water?

MR. J. T. KANE,
95 Brenden Crescent,
Billingham,
Cleveland.

(Mr. Kane enclosed a plastic bag containing one or two drips of water. Ed.).

Dropsy Cure?

I would like to tell you about an apparent cure for that scourge of a disease, dropsy. This is Ringer's Solution. I think I should explain that this solution is used in biological cases to mimic the body juices and keep body tissues alive artificially. Different kinds of animals have different strengths of juices and so consequently different percentages of this solution have been produced.

Having a goldfish sick at school with dropsy, I looked the cure up and found the only one listed (and as far as I know the only one in existence, and a temporary one at that), to be sea-salt crystals. Not having any, I enlisted the aid of the School's Biology Department; and they suggested the Ringer's Solution for frogs, that being the approximate nearest one to fish. The fish affected with the disease was then put into a small tank containing the solution and left alone.

After one day it seemed a bit better and by a further twenty-four hours the fish was cured. Unfortunately, I am not sure whether this is a permanent cure, or just a temporary one.

The solution consists of: (1) water, 1,000 g.; (2) potassium chloride ·42 g.; (3) calcium chloride ·28 g.; (4) sodium chloride 7·50 g.; (5) sodium bicarbonate ·2 g.

I am not sure why this works, but there is a healthy fish to prove it.

Yours sincerely,
D. TALBOT,
17A Nightingale Road,
Hampton, Middlesex TW12 3HU.

A.O.S. Livebearers

Can anyone help me to find breeders of A.O.S. Livebearers, as down here in the South East we cannot get any anywhere. We would be most grateful for any help.

MRS. A. ADAMS,
17 Lower South Road,
St. Leonards-on-Sea,
Sussex TN37 6RH.

Also

Concerning any rumours that Hastings & St. Leonards Open Show is cancelled; this is *not* true.

I have taken over the job of Show manager. We are holding our Open Show on 21st September at Ore Community Centre in Hastings.

ANN ADAMS (MRS.),
Show Manager.

For Beginners

As a beginner in the keeping of tropical fish I have found it difficult to find a good book on the subject. I have found the books generally available tend to comprise two categories. Those simple to understand, but only dealing in generalisations ("if there is not enough light the plants do not grow well," or "too much light and they grow too fast"). Fine, but what is the amount of light generally considered necessary? A small point but it gives an indication. Secondly, complex books giving a fair amount of technical detail which only helps to confuse.

Why not have a small section each month or bi-monthly in the magazine given over to subjects specifically aimed at beginners. This could progress over a period of time into quite complex areas which hopefully would lead to a greater interest in aquariums etc.

M. R. Wales,
72 Grainger Close,
Brighton Hill,
Basingstoke,
Hants. RG22 4EA.

Tru-lite

Having seen the True-lite fluorescent tube reviewed in your issue for May 1975, I called at one of the dealers handling them and inquired the price.

I was unblushingly asked £4·50p for a 24 in. tube. Naturally, I refused to be robbed at the rate of £2·25p per foot, and I hope all other aquarists will follow my example. There is no reason whatsoever that any fluorescent tube should be priced like this. If it is an import, then it should cease to be imported at once and a British manufacturer investigate the possibility of producing an equivalent at a much lower price.

In fact, it seems to me that British manufacturers neglect the aquarium scene shamefully. The best and quietest air-pumps on the market are French, and an air-pump I bought from an old and revered British company proved to have been made in Japan. Another hitherto making its own motorised filters, now offers one made in Germany.

This isn't good enough. It is about time—indeed long past time—that we were offered British goods at reasonable prices. Why, it might even reduce inflation!

LAURENCE SANDFIELD,
Press Officer, E.D.A.S. (F.B.A.S.)

I make no apologies for this strong reply to Mr. Sandfield's letter. I, and many honest fellow traders have suffered this type of cheap non-criticism for many years without defending ourselves and now I intend to put the record straight.

Clearly from the content of Mr. Sandfield's letter he is not a businessman and certainly not a professional aquarist or he would realise the economic and practical absurdity of his statements and suggestions.

When, oh when, will we stop reading in the aquatic press the constant uninformed complaints of profiteering, the anguished cries for a cheaper hobby? Try model aircraft making or golf and see what they set you back!

Firstly, I would unblushingly have asked £5·25p for a 24 in. True-lite as this is the suggested retail price. The method of manufacture of True-lite is such that they will always be more expensive than ordinary fluorescent tubes. The complete phosphor coating and complex structure, built-in longevity (they carry a maker's guarantee of 2½ years and have a life expectancy of approximately 9 years) and the fact that they are imported will always ensure, unfortunately, a high initial outlay. Duro-test hold world patents on the manufacturing process of True-lite and therefore it is not possible for another company to make or market these tubes. True-lite is cheaper in the long term, however, than inferior lighting systems and True-lite users such as London Zoo; Wilhelma Zoo, Stuttgart; Frankfurt Exotarium; Massachusetts General Hospital, to name only a few, have sound economic and scientific reasons for using this light.

I think that gives some explanation as to the expense of True-lite but please allow me a little more space to comment on the underlying implications in Mr. Sandfield's letter.

I agree that the best equipment available to the British aquarist is either imported or made under licence. The reasons are many and complex but one paramount problem is that British manufacturers are frightened to invest money into tooling and equipment to make pumps, aquariums and power filters, etc., of quality, for a hobby that over the years has shown a reluctance to spend money. Aquarists tend to want their hobby on the cheap, and by and large, they get it! In Europe and America the hobby is a prosperous one; with good equipment, fish and journals readily available but at a price British hobbyists would simply refuse to pay.

This is why so many British Pet and Aquatic shops are shamefully run, with filthy aquariums stocked with dying fish, staffed by incompetents and patronised by hobbyists who deserve no better. Nobody is making a fortune in this trade; we work long hours and give a lot of help free of charge, which all too often goes unappreciated, but if you want an even cheaper hobby, then the large number of dealers who do their job badly will proliferate and the intelligent, honest, hard-working professionals will be frightened off, as many already are. So don't come to my shop if all you want is "a few bob knocked off," you won't be welcome. Do support your local dealer if he obviously takes time and trouble over his stock and you his customer. If his aquariums resemble open sewers take your money elsewhere. Only by adopting this attitude will you prove to the manufacturer and retailer alike that you are worth the enormous investment that is necessary to make this hobby and profession not only more sophisticated but honourable.

J. B. Adams,
Director,
The Ark Aquatic Centre Ltd.

MAKE YOUR OWN CABINET AQUARIUM

by David N. Pope

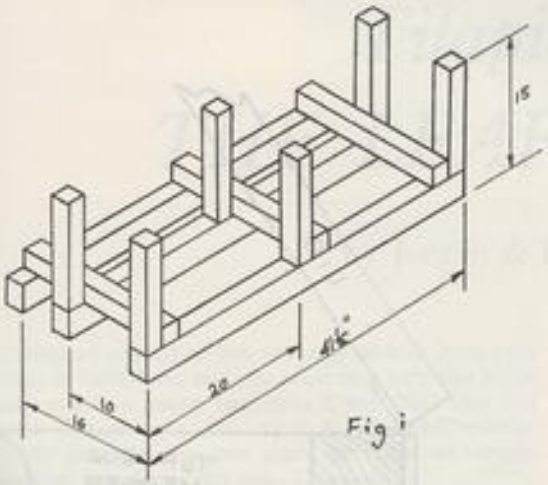


Fig i

LOOKING AT my two tanks on their angle frame one evening I thought how untidy they looked with cables and tubing hanging down the back. This combined with the fact that my toddler daughter delighted in "feeding" my fish with anything which came to hand, made me decide to do something about it.

The solution to my problem was to enclose a tank in a cabinet to form a tidy, daughter-proof and presentable piece of furniture. The actual construction of this cabinet was so easy and successful that I decided to pass on the following plans and instructions to anyone else who may be suffering from similar problems to mine.

My first move was to dispose of my two smaller tanks and frame, and purchase a 39½ in. × 15 in. × 12 in. tank on its own. These plans were formulated around this tank but they can easily be adapted to suit any size tank available.

The wood used was ordinary softwood purchased from my local "Do it Yourself" Shop, and the only

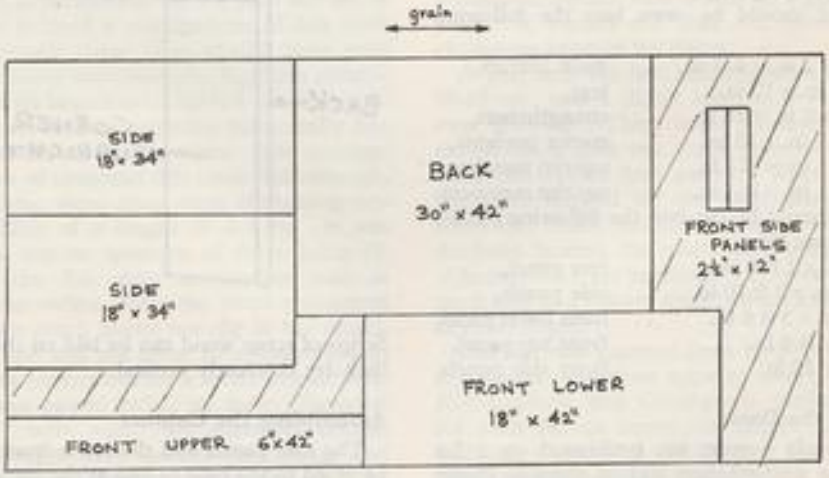


Fig ii

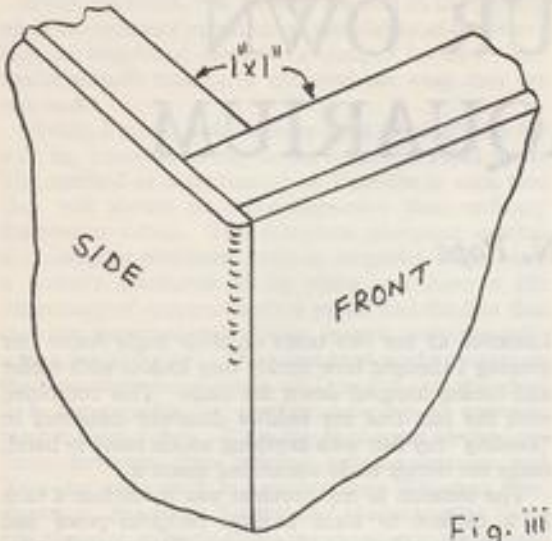


Fig. iii

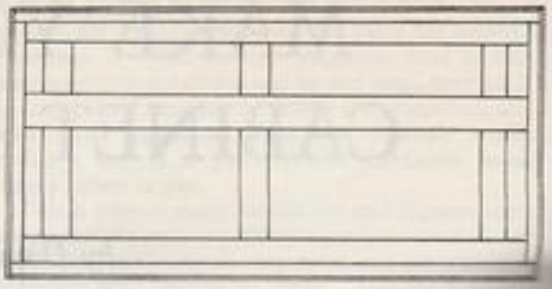


Fig. iv

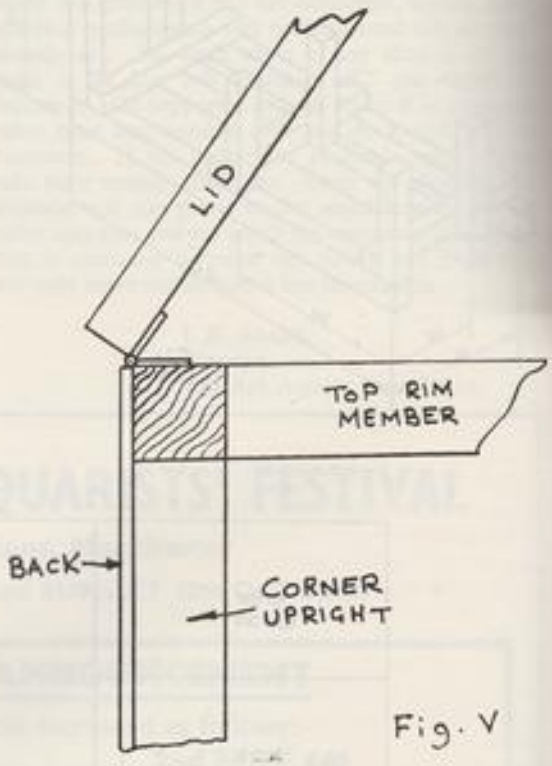


Fig. V

tools required are a saw, steel-rule, screwdriver and a hammer.

Materials Required

Soft wood: 11 ft of 3 in. × 2 in.
11 ft of 2 in. × 2 in.
16 ft of 1 in. × 1 in.
One 8 ft × 4 ft sheet of veneered ¼ in. plywood,
One 18 in. × 42 in. piece of veneered chipboard,
One 24 in., or several shorter hinges,
Three yards of edging strip.

The soft wood should be sawn into the following lengths:

Three of 3 in. × 2 in. × 41½ in.	..	main bearers,
Six of 2 in. × 2 in. × 12 in.	..	legs,
Three of 2 in. × 2 in. × 18 in.	..	strengtheners,
Four of 1 in. × 1 in. × 18 in.	..	corner uprights,
Two of 1 in. × 1 in. × 41½ in.	..	top rim members,
Two of 1 in. × 1 in. × 16½ in.	..	top rim members.

The plywood should be cut into the following pieces, as shown in figure (ii):

One of 3ft 6 in. × 2 ft 8 in.	..	rear panel,
Two of 1 ft 6 in. × 2 ft 10 in.	..	side panels,
One of 1 ft 4 in. × 3 ft 6 in.	..	front lower panel,
One of 6 in. × 3 ft 6 in.	..	front top panel,
Two of 2½ in. × 12 in.	..	front side panels.

Constructing the Base

The three main bearers are positioned on a flat surface and the strengtheners laid on them as shown in figure (i).

Mark and drill for screws and then glue and screw the strengtheners to the bearers.

The legs can now be glued in position as shown. Strips of scrap wood can be laid on the legs to ensure they dry absolutely vertical.

Assembling the Cabinet

The side panels and the lower front panel can now be glued to the base to join at the corners as shown in figure (iii).

Next the rear panel is glued on, leaving a two inch gap along the bottom for ventilation and easy retrieval of anything dropped down the back of the cabinet.

The four corner uprights are now glued into position, these should end one inch below the top rim of the panels.

Now the front upper panel and the two front side panels are added.

Finally the top rim members are glued in position as shown in figures (iii) and (iv).

The lid can now be fitted to the top rear rim member as shown in figure (v). Either one long hinge can be used or several smaller ones.

All that remains is to glue the edging strip around the front aperture.

This cabinet is very easy to construct and anyone thinking of making one should not be deterred through lack of woodwork experience as I certainly haven't any. The finished result definitely shows off the fishes to their best advantage and also seems to insulate the tank from draughts.

Tilapia zillii, THE LEAF-CHOPPER

by Jorgen & Pamela Hansen

DIFFERENT SPECIES of fish can vary greatly from each other in behaviour, and you often take surprises home with you in a plastic bag, even if you think that you have chosen your fish carefully and deliberately. As for example once two years ago when we bought what we later found out were *Tilapia zillii*.

It had become customary for the dealer himself to import fish from wholesalers in the Far East and one of our local shops ordered a consignment of fish from Singapore. Amongst these there should have been 100 *Hemihaplochromis multicolor* (the Egyptian mouthbrooder) of an extra large size i.e. up to 8 cm. in length. We had looked forward to acquiring some really fine *H. multicolor*, which are seldom seen. The consignment of a couple of thousand fish came right enough, and amongst these were some bags containing unidentifiable cichlids of a length of 4-5 cm. It was clear that there was no question of these being *H. multicolor* but the fish were nonetheless sold as Egyptian mouthbrooders, with the usual guarantees that they did not touch plants nor dig in the gravel, were peaceful, and did not grow to a large size, in other words were perfect fish for a dwarf-cichlid tank.

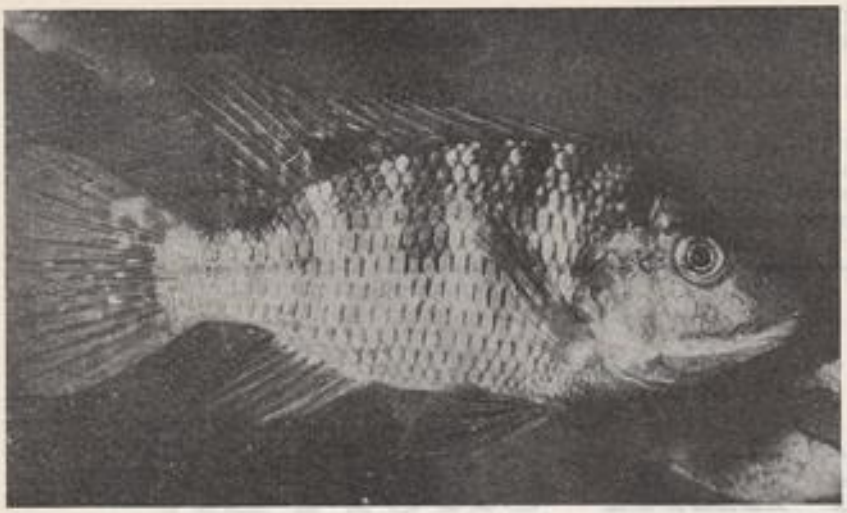
Not many days passed before all these "Egyptian mouthbrooders" were sold. We ourselves bought four, as we thought they looked interesting, and identified them as a *Tilapia* species by the so-called *Tilapia* patch on the posterior half of the dorsal fin. The fish proved to be too small for a closer identification; we could not anywhere find a photo which at all resembled our specimens.

We placed our new purchases in a 200-litre tank with other small African cichlids and fed them alternately with *Daphnia*, Cyclops, dry food, porridge oats, and wheat germ. All the fish grew well and especially our four *Tilapia*. A large Amazon sword plant disappeared mysteriously and the same fate immediately overcame some sturdy 1 metre long *Vallisneria spiralis*, with which we replaced the sword plant. It turned out that our newcomers had a gluttonous appetite for plants.

A year later the fish had reached a length of from 10-15 cm., and it didn't seem as if they would ever stop growing. They were definitely not peaceful either: the largest was a real tyrant, not only to the other fish but to their owner. When *algae* and the like were scraped off the front glass with a razor blade this small, peaceful fish swam rapidly towards the hand holding the razor blade and grabbed a bite of human flesh not particularly deep or sore, but making it look as if a sharp knife had cut a little slice off the attacked finger.

Our fish now measure from 15-20 cm in length and still devour with great appetite most plants excepting *Riccia*, *Pistia* and *Ceratopteris thalictroides*. When fed with lettuce leaves the largest fish delights in grabbing a mouthful of lettuce at the surface, thereafter tyrannizing the remaining fish and preventing them from getting any lettuce, until it is itself ready for a new mouthful. Thus it continues until it is full up or there is no more lettuce.

The fish stir up the bottom so that the 200-litre



Left: Note the relatively large scales and dark bands over the body.

Below: *Tilapia zillii* has sturdy, forward directed mouth.

tank they now have for themselves is almost impossible to keep clean without an effective mechanical filter and a weekly change of half the water.

When the fish had reached a considerable size we thought that it was now time to find out the exact species to which they belonged. We learnt from a friend who had spawned the fish that it was not a mouthbrooder, the eggs instead being spawned in a hollow dug in the gravel. This was welcome information as only six species of *Tilapia* were known to be substratum spawners. Of these the description of *Tilapia zillii* (Gervais 1848) best fitted our fish. The number of spiny and soft fin rays and scales along the lateral line in *T. zillii* are here compared with the number in our fish:

	T. zillii	Our fish
Dorsal fin	XIV-XVI/10-13	XIV/13
Anal fin	III/7-10	III/8
Pectoral fin	14-15	14
lateral line	28-30 scales	29 scales

Description

Almost the whole head is an irridescent turquoise. Uppermost on the gill covering is to be found, as in most cichlids, a large black spot. The basic body-colouring is greyish, with six black bands, of which the two most anterior are Y-shaped, running across the body. The belly is red from the anal fin to the head, with the red colour continuing partly over the lower jaw. The middle of the ventral surface of the lower jaw is black. In the posterior half of the dorsal fin is to be found the aforementioned characteristic black *Tilapia* spot.

T. zillii has a well developed set of teeth especially well suited for cutting plant parts. The teeth are arranged in five rows with the first row being decided cutting teeth. Together with *T. rendalli* *T. zillii* is

classified as a "weed-chopping substratum spawner" or, more popularly, "leaf chopper".

In nature *T. zillii* occurs in waters of a temperature ranging from 14-28° C. It is found in Africa in the area around and north of the equator; in Jordan and Syria, in lake Tiberias, lake Mariut, the river Niger; in ponds in Egypt; and in the Great lakes. It reaches a size of 30 cm in nature, and is caught in large quantities in lake Quarum to be used as industrial fish.

Before spawning, a hollow is generally dug but the eggs are not always spawned here. At 2 mm. in diameter the eggs are smaller than mouthbrooder eggs, and sticky, and are spawned in rows of 15-20. When newly hatched, the young are not borne to the hollow, but brushed there by the parents' fins. *T. zillii* spawn at an interval of 24 days. Both male and female are more strongly coloured at breeding time.

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

I should be grateful for any information you can give me with regard to the horse-faced loach.

This fish is known to science as *Acanthopsis choiorhynchus*. It is a member of the family *Cobitidae* and is found in the natural state in south-east Asia. It probably reaches about 7 in. Specimens reaching the aquarist are usually from the Great Sunda Islands. It is retiring, feeds on almost anything, and appears to mind its own business.

Please give me some information with regard to the scientific name, general requirements and the country of origin of the triangle cichlid.

This fish is known to science as *Uaru amphicanthoides*. It is found in the same waters as *Pterophyllum* species. Hence it flourishes best in soft, acid water and a strictly tropical temperature. It eats the regular live foods, and substitutes for live foods, and, except when courting or in breeding condition, may be kept in a community tank housing fishes of a quiet non-bullying disposition. It still remains a rare fish. By this I mean that although it has turned up every now and again over the last forty years, few aquarists, except those living in towns and cities boasting a first-class dealer's shop, have ever seen it.

Please let me know whether *Nannacara anomala* would be suitable for introduction into a community tank?

I have not kept this delightful pygmy cichlid since the 1930s. For a cichlid it is very manageable; for it is peaceful, does not tear the plants, eats anything, hovers about the bottom yet does not dig up the compost and at full size does not exceed 2½ in. The male may be distinguished from the female by his longer and more pointed dorsal and anal fins.

Is it necessary to clean the bottom of a tank employing under-gravel filtration?

If the filtration system has been in operation for a few years then the answer is take down the set up and give the compost a good wash before replacing the filter plates. If, however, the filtration system has been in operation for only about six months, then siphon out the excessive dirt lodging in the interstices of the compost. Repeat the operation about six months hence and again when you think it is necessary.

I am not at all successful with discus even though I remove two buckets of their 4 ft. aquarium water every week and top up again with heated water fresh from the tap. As a rule the fish assume a dark appearance and die before many weeks are out. I maintain a temperature of 86°F (30°C). Where am I going wrong?

You are going wrong in at least one direction, and this is in adding several gallons of fresh tapwater to the aquarium every week. Discus require very soft and acid water. Few parts of the British Isles can provide soft and acid water from the tap. I suggest that you turn up some of our back numbers and read the authoritative articles on the conditions and care necessary for discus.

I have obtained some members of the *Mormyridae* and cannot find much in my books about this family. Please can you give me some information about mormyrid's requirements and behaviour in the aquarium?

Mormyrids are rather light-shy and retiring, so their tank should contain dense thickets of plants or some tall stones to afford adequate shade and shelter. Next, they seek their food on the bottom and require various worms, small crustaceans, gnat larvae, shredded meat,

flake food and the like, preferably introduced at night. A temperature in the middle to upper seventies (°F) is satisfactory. If other fishes are kept with them, then they should be of a non-boisterous and non-bullying nature. Perhaps the most easily kept species of the *Mormyridae* for the home aquarium are those of the genus *Gnathonemus*.

If I install an under-gravel filter, large stones for retiring places, and omit all plant life, will I be able to maintain a healthy environment for fish?

I have seen quite a few well-filtered tanks furnished with stonework instead of plants. The fishes looked none the worse for their rather bare surroundings. Mark you, some species of fish are more suited to such an environment than others.

Please can you give me some information about a tropical plant bearing the botanical name of *Egenolfia?*

Egenolfia is what is known to science as a rheophyte. This, translated into layman's English, means a plant which grows in places likely to be flooded after heavy rain or at certain seasons of the year. Some rheophytes are only underwater for a few hours at infrequent intervals, other may be submerged for weeks on end yet still survive. Many of these plants, usually ferns such as species of *Bolbitis*, *Microsorium* and *Egenolfia*, submerged for lengthy periods of time make decorative and satisfactory aquarium plants. Species of *Bolbitis* and *Microsorium* have been grown by tropical aquarists for several years now, but I have not seen the fern *Egenolfia* advertised in the aquarium press. I am not certain whether it is native to Africa or Asia or both.

My pair of blue acara have spawned twice but on each occasion the much smaller male has eaten the eggs and the female has then knocked him about most cruelly. What can I do to obtain a successful spawning?

I think it would be a good plan to separate the fish for a few weeks. Fix a sheet of glass across the middle of the tank to divide it into two compartments. Keep the male in one compartment and the female in the other. Now, feed the male on plenty of maggots, chopped or whole earthworms, meat and thin strips of raw fish. This special attention should result in an increase in size and strength. When he looks fighting fit, remove the glass partition last thing at night. In all probability, the fish will court, spawn and raise a family. If they do not behave in a friendly manner, then repeat the performance in the weeks ahead.

I moved a piece of stone under which one of my *Hypostomus plecostomus* kept retiring to for long periods of time and to my astonishment I found about two score of quite well-grown fry lying and moving about in a trough-shaped depression in the sand. My aquarium book elicited the information that this species has not bred in captivity. Do you think I am the first aquarist to have achieved this feat?

Over the last twelve months, I have received several letters from readers informing me that their *Hypostomus* catfish have bred in their tanks. In every case fry have been found under slabs of stone, waterlogged wood or in one case a large sea shell. All I can suggest is that as there are more than a few species of *Hypostomus* or *Hypostomus*-like fishes arriving or are at present being kept in this country, then one or more species are more likely to breed in captivity than the catfish once known as *Plecostomus plecostomus*.

Is the beacon fish easy to breed and what is the best way to go about it?

There is no great difficulty in breeding the beacon fish (*Hemigrammus ocellifer*). The basic requirements, of course, are a pair or trio of the fish in spawning condition. This is denoted by the fuller sides of a ripe female and the brighter colours of the male. Also, there is increased activity on the part of both sexes. A tank holding about 7 gallons of water is large enough. It should be filled with matured water preferably on the neutral to acid side and well-furnished with feathery- or thread-leaved plants. After introducing the fish at normal tropical temperature (about 75°F or thereabouts) this should be increased to the upper seventies or low eighties (°F). The extra warmth combined with a plentiful diet of gnat larvae, whiteworms, and other livefoods, should soon result in egg-laying. As the eggs are not very sticky some will adhere to the plants and some will sink to the bottom. Be this as it may, incubation is completed within the space of two days. Immediately egg-laying is over, the cannibalistic parent fish should be moved to another tank. The fry should be fed on infusoria, a proprietary liquid fry food, or flour-fine dried food.

I have been told that catfish of the genus *Corydoras* were known in aquarium circles as long ago as the eighteenth century. Is this true?

There were no aquarium circles, as you put it, in the eighteenth century. However, it is true that certain species of *Corydoras* were known to zoologists nearly two hundred years ago.

I have two dozen neon tetras in a 4 ft. well-planted tank. What other species would you recommend to live with the neons and make a good and lively show?

I suggest black neon tetras (*Hyphessobrycon herbertaxelrodi*), the platinum tetra (*Gephyrocharax atracaudatus*), the enamel fin (*Pristella riddlei*) and the harlequin fish (*Rasbora heteromorpha*).

COLDWATER QUERIES

by Arthur Boarder

I have a pair of broad-tail Veiltail goldfish and wish to breed from them. What are my chances in a tank, 24 × 12 × 12 inches?

I think that your chances of success with your fish in a tank are very small. They may spawn in the tank but it is almost certain that many or all of the eggs may be eaten by the fish or if any fry hatch, they could be eaten too. To have much chance of success you need at least one extra tank so that when the fish spawn, they can be removed to another tank to leave the eggs to hatch in safety. This is a better method than removing plants with eggs and leaving the fish in the original tank, as fewer eggs are likely to be lost. I favour a pond for the parent fish for spawning purposes and I then remove the eggs to a hatching tank. However, if you have spare tanks your method can be successful. I have never tried breeding fish entirely in tanks, but I have, on occasions, taken a special spawning pair from the pond to place them in a well-planted tank so that they may finish spawning there. They are then returned to the pond when spawning is finished, usually early afternoon. I have found that not only do I know the parentage of any hatched fry, but the number of fertile eggs is increased considerably over eggs left in the pond. The obvious reason is that the sperms of the male fish have a restricted area in which to find the eggs than when in a largish pond.

There is one point I would like to make in respect to my occasional removing of a pair from the pond. I never use a net to catch the fish, but a large saucepan, so that there is less chance of removing any mucus from the fish. Any variety of goldfish caught in a net are likely to receive some damage, however slight. Most fish when in a net thrash about and the chances of the removal of some of their mucus covering is enhanced. Once part of this covering is missing the fish is open to attacks by pests or diseases.

Even if you are successful at hatching some fry, you are not yet out of the wood. After a month the fry will become large enough to be sorted out and spread out in other tanks. One spawning could produce a few hundred fry and although when very small they do not appear to mind being rather crowded, once they are about an inch long over-all, they must have more space and the rule of an inch of body length of fish to 24 square inches of surface area becomes important if the fry are to thrive properly.

We have a fibre glass pool with goldfish, water snails and some water plants. The water will not keep clear and is very green although we have used a recommended cure. Shall we now increase the dosage of the cure?

I do not know what the material you are using contains but I would not recommend that you increase the dosage more than the makers suggest. The green matter in the pond is Algae, which is a single-celled plant. I imagine that anything strong enough to kill the Algae could harm the useful water plants. Of course, the substance you are using may be harmless to other plants but I would be loath to use it. I would prefer to try to clear the water by allowing much of the surface to become covered by water-lily leaves, etc. This would shade out much of the sunlight which is the cause of the growth of the Algae. With sufficient other plant life the Algae would have little chance of thriving. Contrary to popular belief, water snails never yet kept the water in a pond clear. They can eat some water plants, they eat fishes' eggs and can tend to foul the water with their droppings.

Can you please settle an argument? Will goldfish eat tadpoles?

The answer is yes and no, which sounds very muddled. However there are more than one kind of tadpole. There are the frog, the toad and the newt. Goldfish will eat frog tadpoles as soon as they are clear of the jelly mass and continue to do so until the tadpoles are fully grown and their hind legs are forming. At this stage the frog tadpoles can swim very quickly and it would have to be a very active goldfish to catch them. Toad tadpoles are different. When small they may be eaten but once they are about half grown, goldfish will not eat them. If the goldfish have been used to eating frog tadpoles, they will immediately go for toad tadpoles when they are introduced to the tank or pond, but they will be spat out at once and thereafter ignored. It is a well known fact that the toad's skin secretes an acid-like substance and if a dog attempts to bite one it will foam at the mouth and become distressed. It may be that at a certain stage in the development of the toad tadpole, this protective coating is formed. Newt tadpoles can be eaten by fishes.

I have bought two silver fish which have rather large heads. The dealer said that they were Ogens (my spelling), but I cannot find anything about such fish. What do you think they are?

From your description I suspect that the fish are

Nishikoi carp and the variety you have could be Platinum Ohgons. There are many different types and colours of Koi and they have been given names by the Japanese who were responsible for the development of these attractive carp hybrids. It may be questionable as to whether these fish are hybrids as the exact origin appears to be rather secret.

The water-lilies and other plants in my pond have suddenly become sickly and are covered by a brownish substance. What can be the cause of this please?

It appears that the water has become very foul and this has upset the water plants. There must have been a quantity of decaying matter in the pond which has polluted the water. You had better clean out the pond, clean the plants and make a fresh start. Any pond which has been functioning for some years and has not been cleaned out, must have a lot of accumulated matter on the bottom. In warm weather gases form among this matter and can foul the water. The water plants can stand a certain amount of pollution, but there comes a time when even the hardiest ones cannot survive.

I have a number of fantails in a tank which is in good condition and the fish are not in any way over-crowded. At times the fish seem to suffer from irritation and dash about, rubbing themselves against plants and rockwork. I have examined them carefully but can see no signs of pests or disease. What can be the matter with them?

When fish act in this manner it often indicates that they are suffering from an attack of flukes. These are small leech-like creatures which can move about on a fish and suck its juices. However this rubbing action is not always due to flukes and can be caused by the condition of the water. If it contains a quantity of minerals it becomes troublesome to fish and they then are inclined to rub themselves and dash about. When the cause is an attack by flukes there are soon, some other signs of trouble. The fish keep their fins closed, go off their food and mouth at the surface. At a later stage they show blood streaks on the body, become emaciated and die. A fish can live from ten to fourteen days when attacked and so if the trouble is diagnosed early the pests can be destroyed. If a fish is examined with the aid of a strong magnifying glass, the pests can be seen. The treatment is to immerse the affected fish in a solution of a quarter teaspoon of Dettol or T.C.P. to a gallon of water. The fish must not be left in the solution unwatched and then only for a minute or so. If the fish turns over, it must be returned to fresh water when it will soon recover. This same treatment can be used to treat a fish which is attacked by fish lice, (*Argulus*).

If none of the signs mentioned are not in evidence then change the water completely, cut out all dried food for a fortnight, and feed sparingly on live foods, earth-worms preferably.

On the under sides of water-lily leaves in my pond are a number of semi-circular discs of a transparent jelly-like substance. Are these fish eggs or what?

The substance is the egg covering of the eggs of water snails. The kind are from the snail, *Planorbis corneus*, the Ramshorn snail. If you find other lumps of jelly in the shape of a sausage, they will be the egg capsules of the Great Pond snail or Fresh Water Whelk, *Limnaea stagnalis*. You will be able to see tiny dots among the jelly which are the young snails. Fish, like goldfish, lay their eggs singly in amongst water plants, usually near the surface. They are tiny beads of jelly about the size of a pin's head and they adhere to plants or anything else with which they come in contact.

THE SHEDD AQUARIUM *(continued from page 208)*

Shedd does it all is with five separate storage and supply systems; for heated and chilled marine water and heated, chilled and natural freshwater. Tank labels in five colours tell you what kind you're looking at.

In an Oriental-decor gallery of their own are the balanced aquaria for smaller freshwater trops—seven large central tanks and 65 others holding up to 65 gallons each.

Near-neighbours of the non-profit-making Shedd Aquarium are both the Adler Planetarium and the Chicago Natural History Museum. If you have a camera handy, one of the best skyline shots of the Windy City is right outside the door. And if you have more than your one-dollar entrance fee handy (less or nothing for Shedd Society members) the on-premises Sea Shop has aquatic souvenirs in all materials and at all values.

As you leave, you can't help paraphrasing W. C. Fields' condemnation of water as a drinking proposition: "Fish make love in it." The man had no imagination.

But finally, isn't the lovemaking native wildlife of the local lake intself overshadowed by all its exotic rivals? Not a bit of it—the lake's Pyramid of Life gets its own lively feature tank with trout, catfish, bass and, for honest good measure, an old Coca Cola tin dumped on the gravel.

The label on his tank?: "Lake Michigan—It's The Real Thing."

MARINE QUERIES

by Graham F. Cox

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.

The latest addition to my marine aquarium is a Butterflyfish which I have identified from your description in "Tropical Marine Aquaria" and "Tropical Aquarium Fishes" as the Brown Butterfly (*Chaetodon collaris*).

Having only recently joined the ranks of marine hobbyist, I am not yet proficient enough to make the snap identifications generally possible with long experience and, not trusting dealers 100 per cent anyway, I bought the fish purely on the merit of its appearance, i.e., good colour, lively, all fins intact and confident enough to come and have a good look at me whilst I was examining it.

The reason I am writing to you is that in both books referred to above you state that you have experienced difficulty keeping *C. collaris* and that it is only for the advanced hobbyist, yet my specimen appears to be almost the opposite. It is very active, quite tame and has been feeding well from the first day it was purchased on a mixed diet of Tetramin Flakes, Earthworm, Whiteworm, and Heinz baked beans.

My queries are:

1. **Is there to your knowledge, a fish closely resembling *C. collaris* which I may be confusing it with?**
2. **What specific difficulties if any am I to beware of?**

The only difference I can find from your description and picture is that the body lightens to a slightly yellow colour in the dorsal area and dorsal fin but the red, white and brown extremities are clearly defined.

I have also obtained some small anemones the largest being about 15 mm across, the outer skin covering is pale green and the tentacles shading to brown; they don't appear to be armed with a sting, at least not a strong one as *C. collaris* seems to enjoy trying to eat them and throwing them around. Could you give me a hint of what they might be, I cannot find any references to them?

I will close by saying thanks for a lot of useful and practical information which has for me at least made marine fishkeeping an initial success.

Chaetodon collaris is an extremely "unreliable" species in as much as that out of every three we import, two will eat almost anything offered and the third starves to death in our tanks some two months later. It was for this reason that I described it the way I did in TMA. You appear to have bought a good one.

I do not know of any fish which resembles *C. collaris* sufficiently to be mistaken for it by anyone.

Your anemones would appear to be the small colonial anemones of several species commonly imported from Indonesia and invoiced as "Mushroom polyps"—which I suppose is a fairly accurate description of their appearance. Certainly the butterfly fish will eat them—as he will almost all anemones except *Cerianthus* species—and a great number of other invertebrates as well. If you are attempting to create a complete sea aquarium, i.e. a living community of algaes, fishes and invertebrates, then I would strongly recommend you to steer clear of all fishes in the following genera:—*Chelmon, Parachelmon, Chaetodon, Goniochaetodon, Prognathodes, Hemitaurichthys, Megaprotodon, Heniochus, Forcipiger*, etc., i.e. of all

the fishes known loosely as Butterflyfishes.

Finally, I thank you for your very kind remarks about the small amount of assistance which I may have been able to render you, but deplore your unfortunate remarks about not trusting dealers. Until you do find a dealer, in whom you can place 100% trust (and I assure you that such men are, in my experience, in a vast majority in this nation's Pet Industry) then you are going to lose a great deal of money and patience, and cost a lot of blameless creatures their lives.

A prime example of what I mean here is buying sessile invertebrates to house in an aquarium with a butterflyfish or vice versa!

FOR THE HERPETOLOGIST'S BOOKSHELF

by Andrew Allen

THIS month I discuss further books upon the diversity of reptile and amphibian form and species, starting with two in the Hamish Hamilton "World of Nature" series. These are LIVING REPTILES OF THE WORLD by Schmidt and Inger (1957), and LIVING AMPHIBIANS OF THE WORLD (1963) by the late Doris Cochran. Standards of presentation and approach are similar in both; the reptile volume is not on my own bookshelf, so I shall confine discussion to Cochran's work.

Her book is a visual treat, large pages of quality paper adorned by 222 superbly chosen illustrations, 77 in colour. These exemplify the tantalizing beauty of frogs and newts, their enormous variety of colour and shape, in a manner no prose could achieve. Many species illustrated will prove new to British herpetologists; the startling hues and bizarre form of several South American groups provided an aesthetic surprise for this reviewer (me, to be less pompous), reared on the subtler shades of European taxa. Marvel, for example, at the Two-toned arrow poison frog (*Phyllobates bicolor*), a fiery red anuran portrayed with clusters of black tadpoles clinging to its back; or the plastic-moulded Zetek's frog (*Atelopus zetecki*), all angles and gangling legs; or the Golden mantella (*Mantella aurantiaca*); or . . . but see for yourself.

Only a very talented text could hold its own beside such illustrations. Cochran's effort fails in this, but manages to be readable and interesting. Brief chapters on amphibian biology and care in captivity can be dismissed as weightless things. The rest of the account consists of family-by-family descriptions of the different groups.

Caecilians receive scant attention, enough just to whet the appetite. Urodeles and anurans occupy more paper, as befits their species abundance. For each family a number of notable species are cursorily described. No one animal receives detailed study, but the overview is good, studded with fascinating oddments of biology or legend. And although the author was American, species from every land take their rightful place. One can glean much unexpected information, unpretentiously presented, forming a haphazard rag-bag of riches rather than planned assemblage. Hight point of the text is the rigorous standard of systematics, low point the short bibliography. The end result is not a classic, but a book that pleases, and from which much may be learnt.

Older and less easy to find is REPTILES OF THE WORLD by R. L. Ditmars, Sturgis and Walton 1910. Though not on the bookshop shelves, several public, reference and university libraries hold copies. It might also be worth keeping an eye on the second-hand dealers, for species accounts date more slowly than those on general biology.

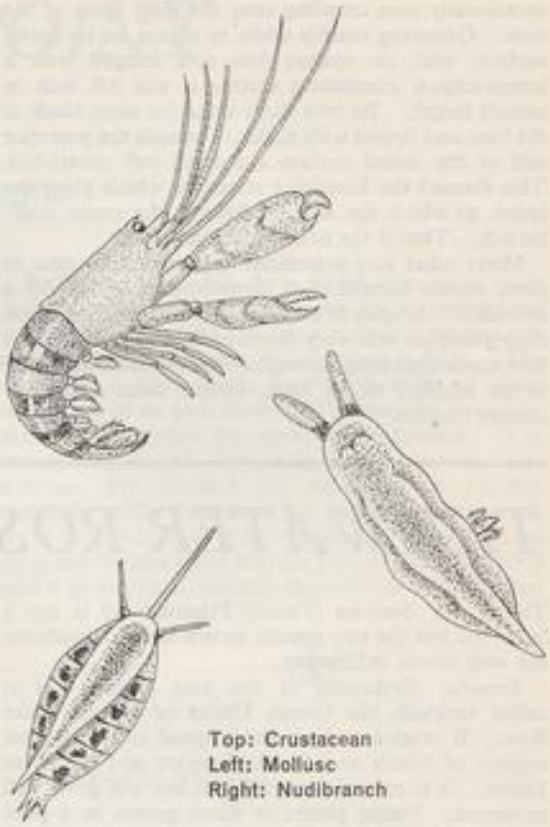
This book is not a masterpiece from the mould of Gadow (see a previous review) or Boulenger, two greats of the era. But good binding and compact presentation, added to other virtues, make this an honest work. It is a species by species account at the level of distribution and natural history, including detailed classifications and unusual anecdotes. The 373 pages are a mine of information to which I still refer often, penned by a man who possessed great practical experience in his subject gained from wide travels and zoo work.

Of course age brings faults. The classifications have been outdated by subsequent taxonomy. The numerous half tone photos were doubtless magnificent for their time, but appear drab and lifeless to our eyes. But this is not intended as a glossy book to look pretty; it is a working book, and still of use if the limitations are recognized.

LIVING ROCK

(PART 2)

by H. G. B. Gilpin & Q. G. B. Gilpin



Top: Crustacean
Left: Mollusc
Right: Nudibranch

It was several months before we realised that the larger piece of rock in the two feet long tank still sheltered some hitherto unsuspected inhabitants. The first indication we had of their presence was a flurry of movement in a heavily shaded hollow beneath the rock and a sudden disturbance of sand in its immediate vicinity at feeding times. Constant observation on our part and increasing confidence on theirs finally gave us a clear view of a prawn-like creature, almost certainly *Potonia custos*, some three centimetres in overall length. Subsequently two more of the creatures were discovered.

They were basically white in colour, banded with pale grey. The left chela was much enlarged, considerably more developed than the right, and the rostrum reduced to a mere point on the carapace. Although in time their nervousness decreased to some extent, their appearances remained strictly confined to feeding times which invariably occurred at 8.30 in the evening. As a particle of food drifted towards their retreat a sudden upheaval, accompanied by an instaneous flash of snapping claws, took place, the morsel disappeared and utter stillness returned. In their native habitat these animals frequent large sponges and mussel beds.

Although at first sight it might be supposed that such retiring animals scarcely merit a place in an aquarium, in actual fact they add enormously to the interest of a community and their very timidity stimulates a constant urge to sit, glued to the tank, in the hope that they will move into view. "Living Rock" is a great time-consumer!

Some crustaceans whose activities could be observed at all times were two minute amphipods whose burrows in the sand were pressed right up against the glass front of the aquarium so that their whole internal structures were exposed and the agitated movements of their inhabitants as they scurried along the tunnels could be seen. Both animals and their burrows were too small for satisfactory observation with the unaided eye but a small powered hand lens, held close to the glass obviated this difficulty.

Numerous tiny molluscs appeared from time to time, on the rocks and creeping across the sand. Mainly conical in shape, these varied in size from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch and seemed to feed mainly on algae. A $1\frac{1}{4}$ inches long clam attracted attention and another particularly interesting specimen, $\frac{1}{4}$ inch in entire length, was often seen crawling across the glass, its rhythmically moving, translucent foot sole travelling slowly over the surface. Viewed ventrally its shell was cream in colour, fairly heavily blotched with dark brown. An intriguing feature was the retractile siphon, protruding from the anterior end and when fully extended equal in extent to half that of the body.

By no means the least fascinating member of this miniature world was a small sea slug, or nudibranch,

occasionally seen crawling over the glass front of the tank. Gleaming marble white in colour on its dorsal surface, with an opaque foot sole fringed with a lemon-edged, translucent mantle it was 3/8 inch in overall length. Its two short tentacles were black at the base and tipped with pink. Towards the posterior end of the dorsal surface a reddish tuft protruded. This formed the breathing structure which gives the order, to which the animals belong, the name nudibranch. That is the naked-gilled animals.

Many other tiny organisms appeared from time to time, mostly incapable of identification, except by a specialist. In spite of the obscurity surrounding them, their presence was very worthwhile and provoked us into much thumbing through all the available literature in an attempt to, at least, isolate them into their correct families.

At first sight this very varied living community might well suggest considerable feeding problems. This, in fact, did not prove to be the case. Small quantities of food were introduced each evening and it was amazing how quickly the lowly forms of life adapted themselves to a regular mealtime and how soon the prawns, crabs and bristle worms came to expect the arrival of food at a fixed time.

The diet included dry marine flake food, readily taken by the worms and crustaceans, freshly hatched brine shrimps and a "squirt" of Liquifry for baby live-bearing fish. Occasional offerings of tiny pieces of raw meat were provided. They became particularly popular with the crabs, shrimps and prawns. Care was taken, of course, to see that all meat fragments were cleared up before they had time to cause pollution of the water.

THE WATER ROSE by Phillip J. Brown

THE genus *Samolus* (Family Primulaceae) is not a large one but the two species grown in our aquariums are well worth cultivating.

Samolus floribundus is the best known and is called variously the Green, Under or simply Water Rose. It originates from the tropical and temperate regions of North and South America and the West Indies. It is naturally amphibious but will grow well submerse. Young plants or those grown in a poor substrate form only the rosette of crisp, light green rather ruffled leaves which vary in shape but are usually rather spatulate with blunt rounded tips. The leaves shade into a flat petiole which with the nervation is almost white. The nerves are branchy and stand out in relief from the leaf's surface. It looks very attractive planted next to rocks in the middle areas of the aquarium. More readily emerse, but under good conditions also submerse, it will form a flowering stem (more technically a raceme). This will grow to about fifteen inches in height. In the aquarium, dependant upon its height, it will either grow out of the aquarium or just above the surface. Leaves grow alternately on the flowering stem and are smaller about two inches long by one inch wide at its widest point. Submerse new plants will form adventitiously in the axils of the upper leaves. Thin white roots will also grow down from it. In shallow water or in damp soil and warm conditions it will readily produce small white flowers. Leaves are rather smaller and thicker looking on these plants. If the flowers are left they will produce small seed pods which will gradually turn brown. Once these have formed they can be removed, allowed to dry for a few days, and then shaken out onto warm (68-70°F) damp soil and covered with a pane of glass. They will root quickly and can then be planted out in the aquarium when a few inches high.

The Water Rose prefers a fairly rich substrate, mature gravel with some clay added or dirty sand and some earth and gravel will produce fine specimens. It should be planted in a light position with sunlight available if possible, this may be important especially for flowering but does not appear to be crucial.

Water conditions are not too important but growth appears to be retarded in very hard water. Temperature can be up to 78°F (contrary to some authorities) and at least as low as 65°F. I have found it to take quickly and grow well in the aquarium and it makes an unusual and attractive feature. Because of its ease of propagation it is always cheap to buy but surprisingly hard to obtain considering its value over many of the short lived tropical marsh plants currently obtainable in the shops.

Less commonly seen but worth cultivating in the unheated aquarium is *Samolus valerandi*. *Forma submersa* is the aquatic form. If seen at all it is generally sold as *Samolus floribundus* but is taller and with somewhat narrower full-edged leaves, 2½-3½ inches long. It is from Europe, and the Mediterranean area, North Africa, western Asia Minor and Bulgaria. It grows in boggy places usually near the sea and is able to withstand moderately brackish water. Its common name is Brookweed. In shallow water and moist earth conditions it bears small white flowers. Its main requirement is strong light; in winter this is essential if it is to overwinter. It is more difficult to cultivate than *Samolus floribundas*.

VIEWPOINT

by A. Jenno

REGULAR READERS may remember my design for a "trap-tank", shown in this column in the July 1974 issue (volume XXXIX, No. 4), which was intended as an aid in saving livebearer fry from the cannibalistic-tendencies of their parents. My objections to the more traditional breeding traps sold commercially were given at the time and need not be dwelt on again, save perhaps to mention that their small size was the biggest criticism.

The trap-tank has been in use since and has been fairly successful, but experience shows that although it does ensure the safety of the great majority of the fry it does have some bad points. Inevitably, some fry are eaten, but the main problem is that when the time comes to move the fry to a larger environment for growing on, it is an inconvenient piece of apparatus from which to net the young fishes. They simply flit back under the grille section when the net is put into the water, and if seriously frightened may even rise through the grille into the adults' living area where they are likely to be promptly eaten. If the base area can be partitioned off while the fry are in that part of the tank so that they cannot go back over the filter bed, then they can be caught more easily, but this may result in crowding if they are numerous and there may then be a tendency for them to panic and jump out or damage themselves against the glass sides.

Something is needed, then, which gives more room during netting and yet keeps the fry accessible and away from the adults. I tried various arrangements and finally settled on the design shown in fig. 1. The divider is a rigid plastic mesh with holes of about one eighth of an inch across. The material is sold by gardeners' supplers for small mesh fencing. It is strong and durable but easily cut to fit with large scissors. My dividers are supported in position vertically with double-sucker heater-holders stuck on to the inside walls of the aquarium. I find that the pregnant females retire into the Java Moss instinctively whilst giving birth, and this then affords initial shelter before the fry find their way through the mesh to the safe area. A small lamp fitted on that side might help attract them in the right direction, but it does not seem to be really needed as they tend to automatically swim away from the adults. The mesh is green, so the fry probably accept it as plant and certainly do not hesitate to swim through.

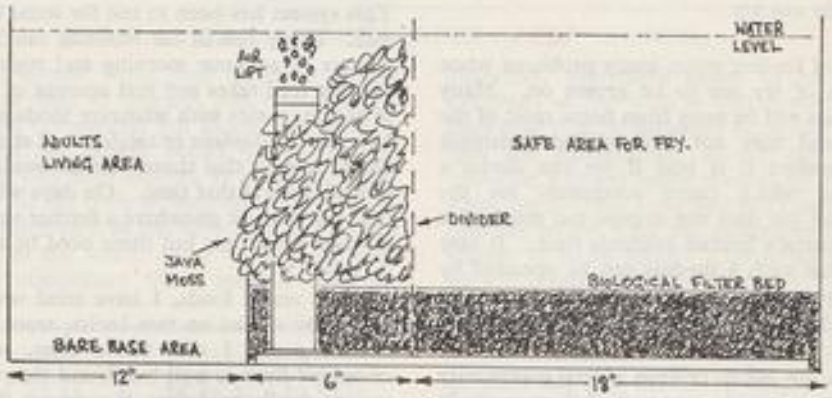


FIG. 1 (NOT TO SCALE)

At present the system is in use in two aquaria, each with a base area of thirty-six by twelve inches. They are divided half way along their length and each contains six large female swordtails and one male. Swordtails are easily the most canabalistic of the common livebearers, so much so that I find it difficult to obtain even a few fry without the provision of some

kind of protection. Guppies and platies are not so difficult if the adults are well-fed, and Mollies seem to vary individually, with the speckled or marbled varieties being generally the worst, but *all* of my Swordtails really relish fry and when several adults are kept together such a system becomes essential. A further benefit in this design is that the females do not have to be netted and moved at any time. They are then far less nervous, they feed better, and do not age so quickly. I am convinced that frequent netting helps cause the bent-backed condition which many large female livebearers develop whilst still relatively young. By inducing the fry to move into an area of eighteen by twelve inches there is no immediate need to transfer them to another aquarium, so they can receive their initial feeding in a much more settled condition. After about a week my own fry are moved into a larger environment, usually of at least twenty-five gallons capacity, and then they remain there until grown up and ready for disposal. In this way the fry only suffer one move during their juvenile stage and this is done at the time when they can best stand it because then they are feeding on newly-hatched Brine shrimp and the continuation of this in the new aquarium helps settle them down again quickly.

The subject of feeding raises many problems when large quantities of fry are to be grown on. Many amateur aquarists will be away from home most of the day at work and may not have skilled assistance available. Therefore it is best if we can devise a feeding method which caters adequately for the fishes' needs and yet does not impose too much of a load on the aquarist's limited available time. It may be important that such a shedule can be operated by one person only at all times, and that time consuming and expensive methods of acquiring foods should be avoided.

Where only a few fishes, or even several community aquaria, are kept it is fairly easy to feed them properly by the traditional methods using a large variety of live, table and dry foods, but when fishes are grown on in quantities in numerous aquaria this idea becomes more difficult to apply and the amounts required necessarily prohibit the use of some favourite foods. Aquatic live foods are a good example. The purchase or the collection from natural sources of sufficient quantities of *daphnia* or *tubifex* in order to include these as a *basic* item of diet is practically impossible. They may be used as supplementary foods, but any efficient programme is best set up to avoid dependence on these. It is also my opinion that the possibility of disease or parasitic infections being transferred with these foods is too high to justify their regular use in crowded environments.

It follows, then, that we should experiment to discover one or two basic, easily obtainable staple foods which require little preparation and are not expensive in quantity. We can then add luxuries and refinements whenever possible to put a little life into what may otherwise become a rather dreary diet. I have a feeling, however, that much of the demand for constant variety in fish feeding is caused by aquarists' considering their fishes as being little people, and so ascribing to them human values of taste and preference. This may result in good feeding, but it can also make for unnecessarily troublesome requirements. Any quantity breeding system must have an efficient and easily operated feeding programme.

Taking the average amateur aquarist then as an example, let us assume that the fishes can be fed in the morning, in the early evening, and by the use of a night-light to avoid total darkness, again late at night. If the growing-on aquaria have a bare base section so that sinking foods can be given fairly heavily without being lost in gravel, then those three feeds ought to suffice. Fig. 2. shows the programme presently in use in my own fish-house. It can be seen that the morning and late-night feeds are fast and easily applied methods and the early evening feed is the one where any messing about and provision of variety occurs. This system has been in use for some time and works well. Every fish in the building can be fed within a quarter of an hour morning and night and only the evening feed takes any real amount of time, and this, of course, varies with whatever foods are being given. I do not use *daphnia* or *tubifex* at all at the moment but would suggest that those who do would find it easiest to feed these at that time. On days when the aquarist is not at work or elsewhere a further small feed can be given at lunchtime but there need be no obligation to do this.

As to staple foods, I have tried several items and have now settled on two basics, trout fry pellets and cooked peas. I did, for a time, use boiled and crumbled liver as well but found that various complications finally made me discontinue this as a regular food. In quantity, liver is expensive and the boiling is messy and takes time. It needs refrigeration if stored and very easily pollutes the aquarium water if overfed. It was used in the first place because of a worry I had over vitamin deficiencies in dry foods, but I now believe that if the trout-fry pellets are obtained fresh and then stored in sealed air-tight containers they do provide these necessary ingredients in the diet and of course other, fresher foods will as well. At any rate, there has not been any obvious change in the fishes' health or growth since discontinuing the liver.

Where trout are farmed on a commercial basis, trout pellets are used exclusively. At the University of Aston Fish Culture Unit practical results show that trout grow rapidly and do not suffer from any defici-

iences when fed only on this one food. It would seem therefore that if a fish which in the wild takes most or all its food alive can be so fed, then surely our tropicals should be capable of using the same diet.

As many aquarium fishes, especially the livebearers, are more vegetarian in their feeding habits than trout, my second basic food choice is cooked peas. They are easy to prepare and feed, and by comparison with commercial fish foods, are cheap to buy. The peas are simply boiled up in the tin, allowed to cool, and then mashed to break the skins. Feeding is carried out with appropriately-sized lumps of the mash, which sink to the bare base and do not easily disperse in the water. The "processed" kind have a better consistency when mashed than the "garden" variety.

It will be noticed that on my schedule the baby fishes receive newly-hatched Brine Shrimp as often as it can be given during the first few weeks. No other food brings them on so well. It takes time and trouble to hatch the eggs, particularly in regular quantities, but there seems to be no satisfactory substitute so the work is well rewarded. Of course, from time to time shortages occur; for instance due to eggs not hatching or, in my case especially, the container rotation being messed up temporarily, and when this happens I use Biol and Liquifry as stop gaps. Another handy food for emergencies is freeze-dried shrimp in tablet form. This is fine enough for the fry and is taken eagerly.

	FRY 0-3 WEEKS	YOUNG 3-12 WEEKS	ADULTS
MORNING 8 A.M.	BRINE SHRIMP BIOL	BRINE SHRIMP (3-6 WEEKS ONLY) TROUT FRY PELLETS	TROUT FRY PELLETS
EVENING 6 P.M.	PEAS BIOL	PEAS CHOPPED WHITEWORM OTHER AS AVAILABLE	PEAS WHITEWORM OTHER AS AVAILABLE
NIGHT 11 P.M.	BRINE SHRIMP BIOL	TROUT FRY PELLETS	TROUT FRY PELLETS

FIG. 2. ALTERNATIVES IN ORDER OF PREFERENCE.

PRODUCT REVIEW

TROPICAL MARINE CENTRE MEDICATIONS

A range of curative chemicals intended for application either directly in the affected aquarium or in a quarantine container. The concentrations supplied allow convenient "drops-per-gallon" dosage rates. Full instructions are included with each package.

Dessamor—A disinfectant for cases of Fungus, Fin Rot, Neon Disease, gill inflamations, and bacterial and fungal problems with livebearers. Recommended treatment times are periods of several days, depending upon the particular trouble and its severity. Dosing can be repeated where necessary.

Faunamor—A contact insecticide to combat Ichthyophthirius (White Spot), which is not harmful to plant life and should be effective within twenty-eight hours. It is said not to damage scaleless fishes.

Odimor—A specialised treatment for Oodinium on marine fishes. The solution does not contain copper and has been satisfactorily tested on over three hundred species of invertebrates. Application is over a two- or three-day sequence.

Marine Cure—A broad spectrum medication for protozoan infections, flukes and crustacean parasites on marine fishes. It may be used as a quarantine preventative or in a three-day treatment. The solution is poisonous to invertebrates.

pH Buffer—A powder compound which can be used in marine aquaria whenever the alkalinity value of the saltwater drops below pH 8·1. Application is by preliminary mixing to produce a liquid addition. The aquarium cannot be overdosed because any excess will simply precipitate out until required.

All of the above products are well packaged and should be storable for long periods. No expiry dates are given, so I assume shelf life is good. The instructions supplied with Odimor and Faunamor state that all plastics in the environment should be removed before treatment because this material tends to render the medicines ineffective. All-plastic quarantine tanks should not be used and where non-removable plastic equipment, such as undergravel filter plates, is present then larger dosages are advised to compensate for its effects. Research has obviously proved this to be a significant point, and I would commend the manufacturers for bringing it to the aquarist's notice. Presumably the idea will apply to the use of some other proprietory brands also.

Odimor in particular should be a welcome addition to the marine aquarist's methods because it now allows treatment of infected fishes living in an invertebrate aquarium. I was able to test Dessamor and Faunamor and found them to be effective and easy to use. Two adult female Zebras which had torn their sides in a badly-constructed spawning trap were treated for fungus, and White Spot and "shimmying" was erradicated from a group of young Mollies.

Prices (at time of writing):—

Dessamor—10 ml 87p, 100 ml £4·86.

Faunamor—10 ml 96p, 100 ml £5·28.

Odimor—10 ml £1·48, 100 ml £6·92.

pH Buffer—small 65p, large £2·60.

All include V.A.T. Distributed to the trade by The Tropical Marine Centre, 25 Hay Lane, Kingsbury, London NW9 0NH. Telephone 01-204 5866.

A. JENNO.

THE INTERPET HYDRO-THERMOMETER

Every aquarist who likes to set up his artificial environments in a decorative manner will try to hide from view as much of the maintenance equipment as possible, so that the simulation of a natural underwater scene is truly representative. Marine aquaria, in particular, benefit if pieces of test apparatus are not visible.

The combination of a hydrometer and a thermometer in one composite unit is a welcome step forward in this direction. Density measurements are commonly taken daily or at least twice-weekly by conscientious marine aquarists, so it is convenient to carry out the routine temperature checks at the same time with the same instrument. There is then no real need to have another thermometer permanently fixed to the inside front glass of the container, with a consequent improvement in natural appearance.

The Hydro-Thermometer is just under eight inches long and about half an inch in diameter at its widest end. Construction is as other hydrometers except that the normally hollow main body contains a spirit-in-glass thermometer and a Fahrenheit scale. Coloured bands are provided on both the temperature and density scales to mark the ranges 70-84°F and 1·020-1·025 respectively, for rough guidance. The instrument is well-made and has a protective storage container. The hydrometer section is calibrated for use in water which is at tropical temperatures, but no indication is given on the instrument or on its container of the exact value used.

Price 97p inc. V.A.T. Distributed by Interpet, Curtis Road, Dorking, Surrey, RH4 1EJ. Telephone Dorking (0302) 3202.

A. JENNO.

THE STYLE AQUARIUM

manufactured by Style Manufacturing Co., of 91, Moyser Road, London, S.W.16.

The Style Aquarium and Stand is the ultimate in all-glass aquaria for the hobbyist. It is most pleasing to the eye both as a home for one's fishes and as a piece of furniture.

The aquarium (sold also as a separate unit) rests on an all-glass base which has a lower shelf suitable for books, magazines or even ornaments. Before filling it is essential, of course, to ensure that the floor surface upon which the unit is to stand is quite level—it is possible to overlook this point where fitted carpets are involved and which may conceal any irregularities in the flooring.

Sliding glass lids cover the aquarium and under them is the housing for lighting units with separate box for starter unit. Such fittings would reside above the anti-condensation lids separating them from the aquarium proper. Access holes for heater, filter connections are provided at the rear corners of the cover glass.

The top panel of glass is darkened which increases the reflection of light to the bottom of the tank. Both the water line finish and the division between aquarium and base are covered with a four inch strip of wood-grain plastic veneer which greatly enhances the general impression of sleekness.

The vertical angles at the rear of the unit are neatly capped with narrow plastic and it might be suggested that the same finishing touch be applied to the front vertical edges as well.

Available sizes are:

Aquariums	Stands
24 in. × 15 in. × 12 in.	24 in. × 26 in. high × 12 in.
30 in. × 15 in. × 12 in.	30 in. × 26 in. high × 12 in.
36 in. × 15 in. × 12 in.	36 in. × 26 in. high × 12 in.
48 in. × 15 in. × 12 in.	

The complete unit has been extremely well designed, constructed and finished and succeeds in escaping from the cumbersome two-tier aquarium structure which has been with us for too long.

L. ADSETT.

THE HIGHGATE AQUARIST

MR. EBERHARD SCHULZE is the proprietor of The Highgate Aquarist—a new aquarium shop situated a mere couple of minutes' walk up the hill from Highgate (Northern Line) Station. The premises and tanks are kept spotlessly clean. Conspicuous, too, is the fitted carpet: a luxury not often met with in establishments of this kind. The rows of tanks that line two walls of Mr. Schulze's shop are mostly given over to discus. By this I mean that, instead of mounting the usual display of bread-and-butter fishes sandwiched between a few of the less common or rare species, Mr. Schulze stocks, or usually has in stock, some half-dozen different types of discus in a variety of sizes and prices. However, he does have an ever-changing range of other cichlids, characins, cyprinids, livebearers and the rest. He does not go in for marines.

Mr. Schulze is a perfectionist. Which explains why his fishes look so colourful and healthy. Every tank—at least every tank housing discus—is filled with soft water filtered through a special peat. The clarity and purity of the water is ensured by the use of external power- and under-gravel filters. Mr. Schulze has made a special study of aquarium water and he certainly knows more about pH and DH than I have the time or the years left to find out for myself.

It is interesting to note that Mr. Schulze obtains his wild-caught discus from Mr. Hans Willi Schwartz. Willi Schwartz is one of the most remarkable men at present in the tropical fish business. His headquarters are in Manaus, the one-time rubber barons' city situated some 1000 miles up the mighty Amazon. From steamy Manaus a score or more of boats owned by Mr. Schwartz travel to and fro about the Amazonian river system. The job of the crews of the boats is to make contact with collectors of fishes in some of the remotest areas of Brazil. Thus Mr. Schwartz is able to dispatch thousands of fishes to almost every part of the world where tropical fishkeeping has become, or is becoming, a way of life rather than just an ephemeral interest.

Among the literature on fishes and aquarium subjects in general The Highgate Aquarist has for sale, I noticed copies of the latest issues of DATZ, *Das Aquarium*, *Aquarien Magazin*, TI (*Tatsachen und Informationen aus der Aquaristik*). So those who are fortunate enough to read German will find much of interest to discuss with Mr. Schulze who keeps himself well-informed about all the developments in the hobby which are taking place in areas far removed from the British Isles and the United States.

Jack Hems

PRESS RELEASE

MINIATURE 500 watt AC POWER CONVERTER

FOR use when mains power is cut or there is a supply breakdown. The Tower Power Converter can be brought into instant use to provide emergency power of 500 watts AC at 230 volts for approximately three hours at a time.

It is a more powerful version of the 200 watt Tower Converter, which aroused considerable interest when it was introduced six months ago. The new model operates by connection to two ordinary 12-volt car batteries. This 500 watt Converter is air-cooled, almost silent and measures only 6½ in. × 9 in. × 4 in. and is finished in matt black. It is supplied complete with jump-leads for connection to the batteries, and the retail price is £80 plus VAT.

Among the many applications of the Converter for emergency heat or power are small workshops, offices, shops, surgeries and many power tools, also kitchen catering equipment and gas-fired or solid fuel central heating installations, and domestic oil-fired systems.

Recharging the batteries is achieved when mains power is restored, by plugging in the cable lead at the back of the Converter to a mains supply socket, setting the switch to "charge" and leaving overnight.

For further information please telephone or write to Mr. E. M. Grice, Tower Flue Components Ltd., Morley Road, Tonbridge, Kent, TN9 1RA. Tel: Ton 67055/6/7.

"He always puts his cats out at night."

ARMITAGE PRODUCT NEWS

GUSSIE Aquarium Backgrounds—

ARMITAGE HAVE introduced a range of intriguing aquarium backgrounds from the U.S.A. These are high quality reproductions of paintings created specially for aquariums. The range includes three designs:

"Sunken Galleon" (see photograph)
"Atlantis"
"Natural Bridge."

Each gives the illusion of considerable depth and adds the right amount of colour and interest without detracting from the fish and plant life in the tank.

These backgrounds are available in two sizes:—for 2 ft tanks at a retail price of £1·00p
and
3 ft tanks at a retail price of £1·50p

However, they can be trimmed to meet the exact sizes of aquariums within this range.

ES-ES Flexible Heater

The ES-ES "Flexible" aquarium heater is now available through pet and aquatic stores in this country. This unique heater is designed to rest within the sand or aquarium compost; it warms the plant roots as well as the water which greatly improves plant growth. Additionally, it has the advantage of being completely unobtrusive in the tank.

The "Flexible" heater is made from long lasting non-perishable silicone rubber tubing which encloses a heavy duty 100 watt element. It is suitable for tanks up to 15 gallons. Retail Price is £2·30. The manufacturers are Messrs. Singleton Brothers (Electronics) Limited, Cornwall, who make a wide range of aquarium heaters and accessories under the famous and internationally known "ES-ES" Brand Name.

Messrs. Singleton Brothers (Electronics) Limited, Cornwall, are part of the Armitage Pet Products Group of Companies.

Adds to the Scene!

by Hilary Maynard

My 1st is in PLANK but not in JOIST,
My 2nd is in LIQUID but not in MOIST.
My 3rd is in JOYFULNESS but not in GLAD,
My 4th is in PAINFUL and also in SAD.
My 5th is in BELLRINGING and also in RUNG,
My 6th is in PLAINSON but not in SUNG.
My 7th is in LETTUCE but not in LEAF,
My 8th is in ARMFULL but not in SHEAF.
My 9th is in TWINKLED but not in STAR,
My 10th is in DISTANCE but not in FAR.
My 11th is in ACUTE but not in SHARP,
My 12th is in PIANOFORTE but not in HARP,
My 13th is in TROTTER but not in SOW,
My whole shows your taste and artistic know-how!

Answer on page 238

Junior Aquarist

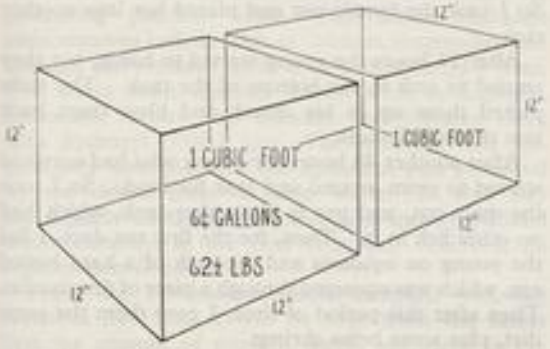
BEGINNERS' CORNER

by Bill Simms

(1) TANK CAPACITIES

Does the talk of tank capacities leave you feeling confused or vague? How much water does a 24 in. tank hold? What's its weight? How many fish . . . ? These and similar questions have to be answered at times—particularly when it comes to placing an aquarium on a sideboard. Many a would-be aquarist has placed on in such a position, and then found that the drawers could not be opened because of the weight of the water-filled tank.

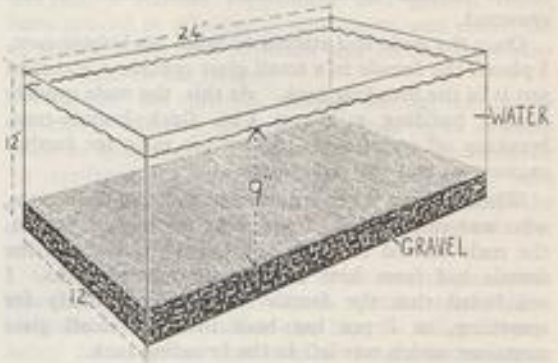
Start to calculate with a 24 in. × 12 in. × 12 in. tank, for that is easy. In actual fact it is two cubes,



each 1 ft. each way. But let us work it out in inches first by multiplying the length by the breadth by the height, because other tanks are of less even size. 24 multiplied by 12 is 288 (square inches), and this multiplied by 12 again is 3456 (cubic inches).

There are 1728 cubic inches in one cubic foot, so our multiplied answer of 3456 is divided by that, and the answer is 2 cubic feet. We must now refer to some given figures which are that 1 cubic foot contains 6¼ gallons, and one gallon weighs 10 lb. So our 2 cubic feet contain 12g gallons (hence the usual description of a 12 gallon tank), and the weight of water in it is 125 lb. This is 1 cwt. 13 lb., and is the reason why the drawers in the sideboard would not open for they were jammed tight by the weight on top.

There are times when we wish to know fairly exactly just how much water there is in a tank—when working out how much of a certain remedy to add, for instance. Taking the 24 in. tank once more: the water is probably an inch from the top, and there are 2 in. of gravel in the bottom. Therefore we must



work out 24 in. × 12 in. × 9 in., which is 288 × 9= 2592 cubic inches. We know that 1728 cubic inches make one cubic foot, so 2592 divided by 1728 produces 1½ cubic feet, or 9 and 3/8ths gallons, weighing 93¾ lb. This is somewhat better for some purposes, but never forget when working out where to place the aquarium that the tank itself weighs something, as does the gravel on the bottom. I once had 14 tanks in a spare bedroom over my sitting-room—where I sat down one evening to work out the total weight. Within a very short time after reaching a total I had half-emptied every tank upstairs!

MY SUCCESS AND TRAGEDY WITH SIAMESE FIGHTERS

by Stephen Elliott (aged 14 years)

THE RED *Betta splendens* (Siamese Fighting Fish) is one of many beautiful tropicals, particularly when breeding. The pair I used for breeding were almost the same size, the male being 2½ in. and the female 2 in.

The male was introduced into an 18 in. × 12 in. × 12 in. tank on a Saturday morning so that I could study the mating procedure during the day. It was well planted with *Elodea canadensis* and *Cabomba caroliniana*, there was also a pile of rocks for the female to hide from the wary male after she had spawned.

Once the male had started to build his bubble-nest, I placed the female in a small glass container and then put it in the breeding tank. At this, the male quickly started building a strong ¼ in. thick bubble-nest, breaking off at intervals to visit his mate for further excitement and encouragement.

When the nest was complete I introduced the female, who was already full of roe, into the tank. At this, the male started to chase the female around, so the female hid from him behind the pile of rocks. I concluded that the female was not yet ready for spawning, so I put her back into the small glass container which was left in the breeding tank.

The next day I looked at the male's bubble-nest and I was pleased to see that it was still intact, if not better. I proceeded to introduce the female to the tank for a second time. The male started to show off his large colourful fins and beckoned the female to come with him under the bubble-nest. After a show of courtship, she came to him and the male finally embraced with her.

The male would roll over on his side and curve his body around her, thus he was able to squeeze her until she released several eggs. At the same time he exuded his sperms so that the spawn would be fertilised. After a few seconds the male released his grip, and the female dropped away from his embrace; while doing so, the female would let go of her spawn and it would fall to the bottom. Then the male swam down to the bottom of the tank and picked the eggs up in his mouth. After this the male would swim to his nest and blow the eggs into it. This procedure went on until there were about 150 eggs, all fertilised and blown into the nest.

After this happened the male started to chase the female around, so I concluded that she had finished her work and that the male was guarding the nest. So I took the female out and placed her into another tank.

After 24 hours the young started to hatch, but they tended to sink to the bottom of the tank. The male picked them up in his mouth and blew them back into the bubble-nest.

After another 48 hours the young who had survived started to swim around and look for food. So I took the male out, and put it in another tank, which had no other fish in it. Then, for the first ten days, I fed the young on *infusoria* and the yolk of a hard boiled egg, which was squeezed through a piece of fine muslin. Then after this period of time, I gave them the same diet, plus some brine shrimp.

It was 15 days after the young had hatched that the heater began to go faulty, and during the night the temperature of the water must have risen to about 90°F. So when I looked at the young the following morning I found that every one of them had died through overheating.

I am now having a tremendous success in breeding Swordtails and Guppies, but I am thinking of breeding Siamese Fighters again.

Answer to Adds to The Scene:

AQUARIUM DECOR

NEW PRODUCTS

AQUATICA 500
Technical Information Pamphlet No. 1

THE AQUATICA 500 has been developed primarily for the use of the home aquarist. It is a piece of scientific apparatus involving a complicated chemical process in order that purified water of a very high quality can be obtained. The Aquatica 500 Kit comprises of the Aquatica Cartridge containing ion exchange resins, and the various tap attachments, and can fittings along with some plastic hose which enables instant purified water to be produced in a matter of minutes.

It is important to note here that this is not softened water but purified water; that is, water that has had the calcium carbonate content removed (removal of temporary hardness) and therefore soft water, but also removal of various elements and dissolved impurities that are always found in tap water.

The Aquatic Cartridge

THE AQUATICA Cartridge has been developed for use in the Kit, by one of Britain's leading water purification companies. The disposable cartridge contains a mixture of both anion and cation exchange resins. Both these resins work in different ways, but their action is totally complementary to each other in producing purified water. The cation exchange resin removes cations such as calcium, magnesium and sodium, and replaces them with hydrogen (H+)ions. The anion resin removes anions such as sulphate, carbonate, nitrate and chloride and replaces them with hydroxyl (OH-) ions. The hydroxyl ions immediately combine with the hydrogen ions produced by the cation resin to form water. In this way the Aquatic Cartridge produces high quality purified water instantly, at the turn of a tap. There is no regeneration *in situ*.

From the information leaflet enclosed with the Aquatica 500 Kit, it will be seen from the tables that the amount of purified water, according to the area of the country in which the cartirdge is used, varies from some 12 to 80 gallons. It must be pointed out here that this is the total production of pure water, and *does not in any way whatsoever indicate the total life of the cartridge for use to the aquarist.* For example, in an area that would produce from the cartridge about 60 gallons of water, it is quite feasible that a further 200 gallons usable to the aquarist can be obtained. It must also be stated that the purified water obtained from the Aquatica Cartridge in the primary use should be mixed with ordinary tap water of the locality in order to make the resultant water usable for the breeding and keeping of the more difficult fishes. This has been explained more fully in the leaflet supplied with the Aquatica 500 Kit. It is therefore advisable that the Aquatica hardness test kit should be used in conjunction with the Aquatica Cartridge. This will enable the user to determine as accurately as necessary when the cartridge is of no further use whatsoever, and is ready for replacement.

Now, by using the Aquatica 500 and Cartridge, water chemistry is made easy for the aquarist, and would-be breeder of more problematic fishes requiring particular water conditions.

Distributed in the U.K. by Aquatic Nurseries Limited, Aqua House, Oak Avenue, Hampton, Middlesex TW12 3PR.

Span P.R. Services

FOLLOWING the successful launch in 1974 of a range of three fish care products, Lotus Water Garden Products Ltd., of Rickmansworth, have now added a further two preparations to bring the total available to five. The original three: Sterazin, for the treatment of general bacterial diseases; Algizin, for the control of algae and treatment of white spot; and SeaVita, a vitamin supplement and general tonic; have proved so effective as treatments, and successful as selling lines, that Myxazin and Haloex have now been added to the range.

Myxazin has proved, during testing, to be an extremely effective treatment for pox virus diseases such as lymphocystis. Fish are treated individually by applying the medication to the damaged area and, once treated, the addition of Myxazin to the pond water prevents the recurrence of similar conditions.

Haloex has been developed to remove all poisonous fluorines and chlorines from pond water. The chemical make of Haloex also has the effect of pre-aging the water so that it is no longer necessary to wait two to three weeks after filling the pool before adding the fish. Once the pool is filled the water requires only aeration for a period of approximately half an hour to provide a mature environment for fish.

Both Myxazin and Haloex are supplied in small glass bottles attractively presented in full colour cartons. The recommended retail price is 70p for each, inclusive of V.A.T., and this is considerably lower for a larger quantity than other treatments of similar type currently available.

Lotus Water Garden Products Ltd., The Highlands, Rickmansworth, Herts.

News 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.

THERE were 651 entries for the **Sudbury A.S.** open show and the results were as follow: Best Fish in Show: J. Brown (Croydon). Highest Pointed Visiting Society: Basingstoke. Class B: 1, P. Newbury (Gosport); 2, M. Lewis (Sudbury); 3, D. Cruickshank (Ealing); 4, T. Burvill (Basingstoke). Class Ca: 1, R. Leslie (High Wycombe); 2, P. Lambourne (Riverside); 3, J. Bayly (Sudbury); 4, E. Stainer (S.L.A.S.). Cc: 1 and 2 F.B.A.S. Champion, T. Burvill (Basingstoke); 3, K. Usher (Doncaster); 4, R. Walsh (Sudbury). Cb: 1, G. Lucas; 2 and 3, E. Fanthem; 4, C. and J. Richards (All of Sudbury). D: 1 and 4, W. A. Knight (Gosport); 2, I. Pierce (High Wycombe); 3, M. Nethersell (Riverside). Da: 1, J. H. Jackson (Basingstoke); 2, T. Jones (S.L.A.S.); 3, K. Usher (Doncaster); 4, K. Purbrick (Hendon). Db: 1, P. Coyle (Walthamstow); 2, T. Fraser (Basingstoke); 3 and 4, P. Newbury (Gosport). E: 1, J. Hughes (Rochampton); 2, A. Chaplin (Basingstoke); 3, T. Wooley (Saracens); 4, I. Lecky (Basingstoke). Ea: 1, C. and J. Richards (Sudbury); 2, C. Goddard (Sudbury); 3 and 4, C. Brietkreutz (Suffolk). F: 1, J. Bayly (Sudbury); 2, P. Brown (Southampton); 3, K. Usher (Doncaster); 4, D. Reilly (Runnymede). G: 1 and 2, D. and P. Lambourne (Riverside); 3, T. Wooley (Saracens); 4, G. Fanthom (Sudbury). H: 1 and 3, M. Nethersell (Riverside); 2, D. Winder (East Dulwich); 4, C. Kislingbury (Runnymede). J: 1 and 3, E. Fanthem (Sudbury); 2, P. Lambourne (Riverside); 4, P. Moye (Sudbury). K: 1, M. Strange (Basingstoke); 2, T. Cruickshank (Ealing); 3, P. Moye (Sudbury); 4, D. Winder (East Dulwich). L: 1 and 3, D. Winder (East Dulwich); 2, C. Kislingbury (Runnymede); 4, B. Leslie (High Wycombe). M: 1, J. Brown (Croydon); 2, C. Kislingbury (Runnymede); 3, D. Reilly (Runnymede); 4, T. Cruickshank (Ealing); Nbm: 1, M. Strange (Basingstoke); 2, A. Chaplin (Basingstoke); 3, D. Reilly (Runnymede); 4, C. Kislingbury (Runnymede). NOT: 1, 3 and 4, K. Usher (Doncaster); 2, T. Fraser (Basingstoke). O: 1, J. Randell (Haslemere); 2, A. B. Noronha (Orpington); 3, G. Lucas (Sudbury); 4, R. J. Hard (Haslemere). P: 1, C and J. Richards (Sudbury); 2 and 4, A. E. Noronha (Orpington); 3, A and J. Waldman (Sudbury). Q: 1, E. Fanthem (Sudbury); 2 and 3, K. Usher (Doncaster); 4, A. E. Noronha (Orpington). R: 1, K. Usher (Doncaster); 2, R. Onslow (Basingstoke); 3, T. Wooley (Saracens); 4, G. Lucas (Sudbury). S: 1, K. Doswell (Havant); 2, D. Cruickshank, (Ealing); 3, C. Lucas (Sudbury); 4, M. Chambers (W.A.D.A.S.). T: 1 and 4, K. Usher (Doncaster); 2, P. Moye (Sudbury); 3, A. Chaplin (Basingstoke). XBM: 1, P. Moye (Sudbury); 2, M. Strange (Basingstoke); 3, R. Onslow (Basingstoke); 4, C. Breitkerutz (Suffolk). XOT: 1, 2 and 4, K. Usher (Doncaster); 3, T. Fraser (Basingstoke).

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DURING the main part of the July meeting of the **Mid-Sussex A.S.** members were given a lecture on showing fish by Mr. Mervyn Strange of Basingstoke.

Mr. C. Corbin and Mr. J. Burtles judged the monthly Table Show and awarded the prizes as follow: Killifish: 1, P. Dearing; 2, E. T. Tester; 3, D. Soper; Novice, P. Dearing. Botias: 1, D. Instead. Coolie Loaches: 1, and 2, A. Roffe; 3, P. Berry; 4, D. Soper; Junior, A. Roffe. Livebearers: 1, A. Holmes; 2, E. Stanger; 3, E. and T. Tester; 4, C. Roffe; Junior, D. Instead; Novice, E. Stanger. Coldwater: 1, D. Istead; 2, A. Farmer; 3, R. Stanger.

It was agreed to hold a meeting (not on programme) on Thursday, 14th August at the Fox and Hounds at 8 p.m. The lecture will be on the Amazon by Mr. D. Soper. There will be no table show.

Anyone who is interested in joining the Club is welcome to attend a meeting as a visitor. Further information may be obtained from the Secretary Mr. B. Slade, Sandown, Bolney Road, Anstye. Tel: H. Heath 53747.

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THE first open competition held by the **Dunlop Aquarium Keepers Society** proved to be a rousing success, with a record number of entries for the Northern area. 808 exhibits of tropical, marine and coldwater fish were on display and over 1,000 visitors came to see them. 26 societies competed, and 185 exhibits were from the society's own members. Dunlop managed to win five trophies, including the Best Fish in Show Cup.

The trophy winners were as follow: Best Livebearers (Class A): R. W. Carter (St. Helens). Best Anabantid (Class B): M. Rimmer (Sandgrounders). Best Cichlid (Class C): A. Roche (Dunlop). Best Barb (Class D): A. Vaissier (Merseyside). Best Characin (Class E): J. Ridley (Heywood). Best Toothcarp (Class F): B. Marshallses (Blackburn). Best Minnow, Danio, Rasbora (Class G): P. Wrench (Northwich). Best Catfish (Class H): G. Muckle (Sandgrounders). Best Shark or Flying Fox (Class I): R. Armstrong (Dunlop). Best Junior Entry (Class M): Master B. Lees, (Castleford). Best Coldwater Fish (Class O): S. Foote (Accrington). Best Marine Fish (Class P). A. Davies (Dunlop). Best Novice Entry (Class Q): W. Lewis (Dunlop). Showman with most points: P. Batchelor (Loyne). Best Fish in Show: R. Armstrong (Dunlop). Other section winners were: True Pairs: Master J. Emerson (Castleford). Breeders: S. Hooton (Sandgrounders). Any other variety not listed: P. Batchelor (Loyne). Ladies (any variety): Mrs. B. Sey (Dunlop). Decorated Jars: E. Jones (Wrexham).

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THREE classes of fish were judged at the July meeting of the **Brighton& Southern A.S.** There was another large number of members in support. Corydoras: 1 and 2, Mr. and Mrs. Rooney; 3, T. Ramshaw; 4, Mr. Collins. Killies: 1 and 4, B. Sayer; 2 and 3, Miss K. Sayer. Labyrinths: 1 and 2, G. Clarke; 3 and 4, T. Ramshaw. Plants: 1, Miss K. Sayer.

THERE were 437 entries at the Annual **Accrington & District A.S.** Open Show. The Best Fish in Show award went to Mr. S. Hooton of Sandgrounders Society in the Cichlid over 3 inches class. Results were as follow: Guppies: 1, T. Marshall (F.G.A.); 2, Mr. and Mrs. Greenhalgh (Bury F.G.A.); 3, Miss N. Burton (Blackburn). Platies: Miss J. Brown (Blackburn); 2, L. Burt (Wythenshawe); 3, Miss N. Burton (Blackburn). Swords: 1, Miss N. Burton (Blackburn); 2, Mr. and Mrs. Burton (Blackburn); 3, Mr. and Mrs. Newton (Blackburn). Mollies: 1, Masters N. and M. Rimmer (Sandgrounders); 2, Mr. Ackroy (Aireborough); 3, M. Baker (Warrington). A.O.V. Livebearer: 1 and 3 Mr. and Mrs. Newton (Blackburn); 2, P. Walsh (Blackburn). Characins (3 in.): 1 and 3, P. and M. Batchelor (Loyne); 2, D. Sugden (Bradford). Characins (over 3 in.): 1, J. Ridley (Heywood); 2, Mr. and Mrs. Ham (Lytham); 3, D. Chapman (Nelson). Cichlids (3 in.): 1, Mr. and Mrs. Burgoyne (Farnworth); 2 and 3, Mr. and Mrs. Myatt (Hudderfield). Cichlids (over 3 in.): 1, S. Hooton (Sandgrounders); 2, D. Gregson (Blackburn); 3, W. Edwards (Farnworth). Angels: 1, I. Essex (Heywood); 2, Miss J. Brown (Blackburn); 3, D. Gregson (Blackburn). Barbs (3 in.): 1 and 2, Mr. and Mrs. Stock (Farnworth); 3, W. Smith (Osram). Barbs (over 3 in.): 1, G. Metcalfe (Loyne); 2, A. and S. King (Farnworth); 3, Mr. and Mrs. Brown (Accrington). Egglaying Toothcarps (A): 1, and 2, M. B. Fairclough (Farnworth); 3, C. Whitsey (Accrington). Egglaying Toothcarps (B): 1, 2 and 3, M. B. Fairclough (Farnworth). A.O.V. Egglaying Toothcarps (C): 1, D. Ridyard (Leigh); 2, C. Whitsey (Accrington). Carps and Minnows: 1, J. Hopkin (Warrington). Labeos, Sharks and Foxes: 1, Mr. and Mrs. Newton (Blackburn); 2, D. Sugden (Bradford); 3, D. P. Gardiner (Blackburn). Danios: 1 and 2, Mr. and Mrs. Burton (Blackburn); 3, Miss J. Brown (Blackburn). Rasboras: 1, A. Baldwin (Nelson); 2, M. and N. Rimmer (Sandgrounders); 3, Mr. and Mrs. Burton (Blackburn). Fighters: 1, T. Davis (Heywood); 2, W. Smith (Osram); 3, Mr. and Mrs. G. Brown (Accrington). Anabantids (3 in.): 1, M. and N. Rimmer (Sandgrounders); 2, P. Squirrell (Wythenshaw); 3, Mr. and Mrs. Ham (Lytham). Anabantids (over 3 in.): 1, G. Waterhouse (Sandgrounders); 2, Mr. and Mrs. G. Crowley (Middleton); 3, D. Sugden (Bradford). Livebearers (Pairs): 1, Mr. and Mrs. Newton (Blackburn); 2, Mr. and Mrs. Jarvis (Sandgrounders); 3, J. Turner (Doncaster). Pairs (Egglayers): 1, A. Oldham (Wythenshaw); 2, Mr. and Mrs. Stock (Farnworth); 3, Mr. and Mrs. Myatt (Huddersfield). Breeders (Livebearers): 1, A. Baldwin (Nelson); 2, Mr. and Mrs. Newton (Blackburn); 3, D. Ridyard (Leigh). Breeders Egglayers (A): 1, J. Ridley (Heywood); 2, G. Boys (Lytham); 3, Mr. and Mrs. Jarvis (Sandgrounders). Breeders Egglayers (B): 1 S. Hooton (Sandgrounders). Catfish and Loach (3 in.): 1, Mr. and Mrs. Newton (Blackburn); 2, D. G. and S. Harvey (Sandgrounders); 3, P. and M. Batchelor (Loyne). Catfish and Loach (over 3 in.): 1, P. and M. Batchelor (Loyne); 2, Mr. and Mrs. Burton (Blackburn); 3, Mr. and Mrs Jervis (Sandgrounders). A.O.V. Tropical: 1 and 2, P. and M. Batchelor (Loyne); 3, I. Holt (Nelson). A.V. Marine: 1, P. Squirrel Wythenshawe); 2, K. Smith (Middleton); 3, Mr. and Mrs. Crompton (Accrington). Juniors: 1, Miss N. Burton (Blackburn); 2, P. Sugden (Bradford); 3, Miss L. Ridley (Heywood). Ladies A.V.: 1, Mrs Newton (Blackburn); 2, Miss A. Gregory (East Lancs.); 3, Mrs V. Brown (Accrington). Mini Jars: 1, M. Wild (Accrington); 2, Master N. Holden (Accrington); 3, K. Smith (Middleton). Common Goldfish and Comets: 1, H. Penhall (Osram); 2, Mr. and Mrs. Wolstenholm (Blackburn); 3, Mr. Ackroyd (Aireborough). Moors: 1, Mr. Ackroyd (Aireborough); 2, C. Wallbank (Blackburn); 3, M. Wild (Accrington). Veiltails: 1, A. Phillipson (Doncaster); 2, S. Foote (Accrington); 3, C. Whitsey (Accrington). Shubunkins: 1 and 3, S. Foote (Accrington); 2, C. Whitsey (Accrington). Koi: 1, Mr. and Mrs. Wolstenholm (Blackburn). Fantails: 1, R. Duckworth (Doncaster); 2, S. Walsh (Accrington); 3, C. Whitsey (Accrington).

Orandas: 1, C. Whitsey (Accrington); 2, R. Duckworth (Doncaster); 3, A. Phillipson (Doncaster). Lionheads: 1, M. Penhall (Osram); 2, C. Wallbank (Blackburn). A.O.V. Coldwater: 1 and 2, G. Harvey (Sandgrounders); 3, D. Harvey (Sandgrounders). A.V. Fancy Goldfish: 1, H. Penhall (Osram); 2, R. Duckworth (Doncaster); 3, C. Whitsey (Accrington).

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OFFICIALS were elected for **Brize Norton A.S.** at the last meeting and the new committee is as follows: Chairman: C. J. Adair; Secretary, D. A. Tovey, 28 Northolt Road, Carterton, Oxon. Treasurer and Library Keeper, D. Gilks. The club now meets at the Lord Kitchener at Curbridge every other Tuesday evening, August 5, 19, September 2, 16, 30 October 14, 28, and so on every other week.

As a new club with a strength of about twenty, new members will be welcome to come along to the meetings. The programme planned for this year includes a combined evening and slide show with another local club and various F.B.A.S. slide shows subject to availability. The club also plans to visit the Belle Vue festival, Manchester in October.

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THE West Midland section of the **British Cichlid Association** paid a visit to Bristol Zoo early in July and during the visit to Bristol a call was made on the very friendly home of Mrs. Redcliffe a well known breeder of Rift Lake Cichlids.

At the group's July meeting the main item of the evening was a slide show entitled The Tale of a Fish, the commentary being given by J. Reeves. It was decided to hold an extra meeting per month so anyone interested in cichlids will be made most welcome on the second and last Tuesday of every month at the Midlands Vaults, Upper High Street, Wednesbury at 8.00 p.m.

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WITH a record number of 441 entries and a very high standard of fish the **Cardiff A.S.** open show proved a great success. Best Fish in Show was won by C. and J. Richards, Sudbury A.S. F.B.A.S. Champion Class Q (Swordtails): K. Usher, Doncaster A.S. Most points in Show: C. Turner, Cardiff A.S. Most points Cardiff member: C. Turner. Best Coldwater: D. Warmeant, Cardiff A.S. Barbs: 1, Mr. and Mrs. Dore (Newport); 2, G. Best (Swansea); 3, M. Strange (Basingstoke); 4, C. and J. Richards (Sudbury). Characins: 1 and 2, C. and J. Richards (Sudbury); 3, C. Turner (Cardiff); 4, C. Harding (Cardiff). H and H Characins: 1, C. Harding (Cardiff); 2 and 3, C. Turner (Cardiff); 4, A. C. Tull (Salisbury). Cichlids: 1, R. Daws (Cardiff); 2, B. Guy (Cardiff); 3, T. Fraser (Basingstoke); 4, J. Egan (Port Talbot). Angels: 1, R. Onslow (Basingstoke); 2, K. Usher (Doncaster); 3, R. Dore (Newport); 4, J. J. Edwards (L. Major). Dwarf Cichlids: 1, T. Fraser (Basingstoke); 2 and 3, G. Best (Swansea); 4, F. Timmins (Gloucester). Haplochromis Der: 1 and 2, C. Morrison (Port Talbot); 3 and 4, A. S. Gibson (Reading). Anabantids: 1, F. Timmins (Gloucester); 2, E. Jones (Port Talbot); 3, J. Harding (Cardiff); 4, D. Warmeant (Cardiff). Siamese Fighters: 1, C. Harding (Cardiff); 2, D. Warmeant (Cardiff); 3, C. and J. Richards (Sudbury); 4, G. Parker (Dow Corning). Egglaying Toothcarps: 1, K. Usher (Doncaster); 2, M. Addicott (Newport); 3, R. Poots (Yate); 4, C. Churchill (Yate). A.V. Catfish: 1, Mr. and Mrs. Dore (Newport); 2, C. Turner (Cardiff); 3, Master J. Edwards (L. Major); 4, Mr. and Mrs. Harding (Cardiff). Corydoras: 1, B. Guy (Cardiff); 2, G. Best (Swansea); 3, P. Moye (Sudbury); 4, R. Daws (Cardiff). A.V. Tropical (Jnr.): 1 and 2, J. Edwards (L. Major); 3, A. Parker (Dow Corning); 4, B. Bow (Merthyr). Rasboras: 1, C. Turner (Cardiff); 2, P. Moye (Sudbury); 3, T. Fraser (Basingstoke); 4, C. Harding (Cardiff). Danios/W.C.M.M.: 1, M. Strange (Basingstoke); 2, P. Moye (Sudbury); 3, S. Bartlett; 4, R. Javis (Gloucester). Loaches/Botias: 1 and 2, A. C. Tull (Salisbury); 3, C. Turner (Cardiff); 4, K. Usher (Doncaster). A.O.V. Tropical Fish. 1 and 4, C. Turner (Cardiff); 2, R. Onslow (Basingstoke); 3, B. Guy (Cardiff). AA.V. Sexed Pairs: 1, M. Strange (Basingstoke); 2, Master J. Edwards (L. Major); 3, R. Daws (Cardiff); 4, P. Moye (Sudbury). Guppy (M): 1 and 3, P. Purdy (North Gwent); 2, G. R. Heppenstall (Dow Corning); 4, D. Richards (Rhondda). Guppy (F): 1 and 2, C. and J. Richards (Sudbury); 3, G. Lewis (L. Major); 4, S. Bartlett. Swordtails: 1 and 2, K. Usher (Doncaster); 3, A. and M. Smith (Rhondda); 4, B. Purdy (North Gwent). Platies: 1, C. Turner (Cardiff); 2, R. Onslow (Basingstoke); 3, Mr. and Mrs. C. Harding (Cardiff); 4, M. Guthrie (Barry). Mollies: 1, D. Warmeant (Cardiff); 2, B. Davies (Rhondda); 3, G. Best (Swansea); 4, B. Ashcroft (Rhondda). A.O.V. Livebearer: 1 and 2, K. Usher (Doncaster); 3, T. Fraser (Basingstoke); 4, P. Moye (Sudbury). Breeders Egglayers: 1, Mr. and Mrs. C. Harding (Cardiff); 2, R. Onslow (Basingstoke); 3, M. Strange (Basingstoke); 4, B. Purdy (North Gwent). Breeders Livebearers: 1 and 3, K. Usher (Doncaster); 2, C. Turner (Cardiff); 4, R. Poots (Yate). S.T. Goldfish: 1, 2 and 3, C. Rupert (Port Talbot); 4, Mr. and Mrs. Harding (Cardiff). T.T. Goldfish: 1, D. R. Warmeant (Cardiff); 2 and 3, C. Rupert (Port Talbot). A.O.S. Coldwater: 1, D. Warmeant (Cardiff); 2, 3 and 4, C. Rupert (Port Talbot). A.V. Plants: 1, P. Merritt (Reading); 2, P. Moye (Sudbury); 3, Mrs. Bartlett; 4, Mr. and Mrs. C. Harding (Cardiff).

A cordial invitation is extended to all enthusiasts in the Cardiff area to visit Cardiff A.S. meetings which are held at a Private Club Room, Tredegar Hotel, Clifton Street, Roath, Cardiff, **every last Thursday of each month.**

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OPEN Show results of the **Catfish Association** were as follow: Class Gc, Bagridae: 1, S. Adams (B.G.A.S.); 2, P. Elson (S.L.A.S.); 3, L. Derrick (Croydon); 4, J. Hughes (Roehampton). Class Ge, Callichthyidae: 1, T. Woolley (Saracens); 2, J. Hughes (Roehampton); 3, M. Sandford (Reigate & Redhill); 4, C. Lewis (Roehampton). Class Gg, Claridae: 1, M. Sandford (Reigate & Redhill); 2, P. Jones (Catfish Association); 3, D. R. Blundell (Abingdon); 4, G. Biggs (Riverside). Class Gh, Doradidae: 1 and 4, W. F. Sutton (Catfish Association); 2 and 3, T. Woolley (Saracens). Class Gk, Loricariidae: 1, L. G. Tilley (Saracens); 2, D. R. Blundell (Abingdon); 3, J. Dickinson (Havant); 4, T. Woolley (Saracens). Class Gm, Mochokidae: 1, Sybil Hedges (B.G.A.S.); 2 and 3, A. Haley (B.G.A.S.); 4, W. F. Sutton (Catfish Association). Class Gn, Pimelodontidae: 1, W. F. Sutton (Catfish Association); 2 and 4, May Nethersell (Riverside); 3, Mr. and Mrs. A. Sharp (Sittingbourne). Class Gq, Schilbeidae: 1, C. W. Goddard (Sudbury); 2, C. Rumsby (Gt. Yarmouth); 3, Gina Sandford (Reigate & Redhill). Class Gr, Siluridae: 1, D. Allison (Hendon); 2, Ruth Pilsbury (Northampton); 3, T. Woolley (Saracens); 4, Mr. and Mrs. Murphy (Catfish Association). Class Gz, A.O.S. Catfish: 1 and 4, G. Biggs (Riverside); 2, D. Reilly (Runnymede); 3, May Nethersell (Riverside). Class Ha, Brochis: 1 and 3, May Nethersell (Riverside); 2, D. Reilly (Runnymede); 4, K. Taylor (Havant). Class Hb, Corydoras (2½ in. and under): 1, P. Moye (Sudbury); 2, P. Rushbrooke (Reading); 3, T. Jones (S.L.A.S.); 4, W. F. Sutton (Catfish Association). Class Hc, Corydoras (over 2½ in.): 1, C. Kislingbury (Runnymede); 2 and 4, K. Taylor (Havant); 3, Mr. and Mrs. Murphy (Catfish Association). Class Hz, Corydoras (not on F.B.A.S. size sheet): 1, Fran Rogers (B.G.A.S.); 2 and 3, P. Moye (Sudbury); 4, M. Cook (Croydon). Class Ng, A.O.S. Catfish Pairs: 1, G. Biggs (Riverside). Class NH, Corydoras and Brochis Pairs: 1, D. Reilly (Runnymede); 2, C. Breitkreutz (Gt. Yarmouth); 3, T. Duffy (Bracknell); 4, C. Rumsby (Gt. Yarmouth). Class XG, A.O.S. Catfish Breeders: 1 and 2, C. and D. Bottoms. Class XH, Corydoras and Brochis Breeders: 1, C. Breitkreutz (Gt. Yarmouth); 2 and 3, T. Duffy (Bracknell); 4, L. G. Tilley (Saracens). Special Class: 1, C. Kislingbury (Runnymede); 2, P. Moye (Sudbury); 3, P. Reilly (Runnymede); 4, C. Rumsby (Gt. Yarmouth). Winner of the Aquarist Gold Pin, The King Trophy for Best Fish in Show and the F.B.A.S. Supreme Championship Trophy for Class Ha was May Nethersell of Riverside with a Brochis coeruleus. She also won the Cruickshank Trophy.

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AT the second meeting in June of the **Hastings & St. Leonards A.S.**, Mr. McCormick gave a very interesting talk on feeding and the cultivation of live foods. The meeting ended with members telling of their own experiences with various foods.

The first meeting in July brought the announcement of the Pond and Home Aquaria winners. The judges both gave a short talk on what they looked for when judging, and how members might improve their exhibits. The winners were: Pond Competition: 1, Mr. Reed; 2, Mrs. Pollard; 3, Mr. Packstone. Home Aquaria (Adult): 1, Mr. Waddell; 2, (two winners), Mr. Martin and Mr. Hunt. Plant: 1, Mr. Pannell. Home Aquaria (Jnr.): 1, C. Christeau; 2 and 3, G. Brooks.

At this time of the year there are many visitors to Hastings and St. Leonards, and they can be assured of a warm welcome at the meetings, which are held every second and fourth Friday in the month at 18 Cornwallis Gardens, Hastings at 7.30 p.m.

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RESULTS of the **Sandgrounders A.S. Annual** Open Show were as follow: Guppies: 1 and 2, B. Lees (Wythenshawe); 3, Mr. Poulton (Northwich. Swordtails: 1, B. W. Carter (St. Helens); 2, Mr. and Mrs. Muckle (Sandgrounders); 3, Mr. and Mrs. Burton (Blackburn). Platies: 1, P. Squirrell (Wythenshawe); 2, C. Norton (Sandgrounders); 3, K. Houghton (Southport). Mollies: 1, K. Houghton (Southport); 2 and 3, Mr. Poulton (Northwich). A.O.V. Livebearer: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, B. Walsh (Blackburn); 3, K. Wright (Sandgrounders). Small Anabantids: 1, Mrs. P. Taylor (Merseyside); 2, C. Norton (Sandgrounders); 3, M. and N. Rimmer (Sandgrounders). Large Anabantids: 1, A. Hopwood (Wrexham); 2, K. Sey (Dunlop); 3, C. Norton (Sandgrounders). Siamese Fighters: 1, R. I. Payne (Merseyside); 2 and 3, T. E. Davies (Heywood). Small Cichlids: 1, J. Bate (Sandgrounders); 2, K. Houghton (Southport); 3, Mr. and Mrs. Gardiner (Blackburn). Large Cichlids: 1 and 3, B. Crabtree (Sandgrounders); 2, A. Hopwood (Wrexham). Rift Valley Cichlids: 1, Mr. Mason (Farnworth); 2, S. Hooton (Sandgrounders); 3, Mr. Burgoyne (Farnworth). Angels: 1, A. Manser (Sandgrounders); 2 and 3, Mrs. E. Axon (Ashton-under-Lyne). Small Characins: 1, Miss S. Goddard (Macclesfield); 2 and 3, P. and H. Batchelor (Loyne). Large Characins: 1, P. and H. Batchelor (Loyne); 2 and 3, Mr. and Mrs. R. Houghton (Southport). Small Barbs: 1 and 3, Mr. and Mrs. Stock (Farnworth); 2, T. Hampton (Dunlop). Large Barbs: 1, Mrs. Winstanley (Runcorn); 2, Mr. and Mrs. Bond (Sandgrounders); 3, A. Vaissiere (Merseyside). Rasboras: 1, Mr. and Mrs. Houghton (Southport); 2, Mr. and Mrs. Muckle (Sandgrounders); 3, E. Lees (Wythenshawe). Minnows: 1, W. Bamber (Sandgrounders); 2, K. Bickle (Wrexham); 3, T. and J. Selby (Wythenshawe). Danios: 1, E. Lees (Wythenshawe); 2, W. Bamber (Sandgrounders); 3, T. Hampton (Dunlop). Killifish: 1 and 2, K. Kryger (Wrexham); 3, C. Whitsey (Accrington). Small Catfish: 1, B. W. Carter (St. Helens); 2, D. G. and S. Harvey (Sandgrounders); 3, P. and H. Batchelor (Loyne). A.O.V. Catfish: 1, P. and H. Batchelor (Loyne); 2, Mr. and Mrs. Bond (Sandgrounders); 3, Mr. Gough (Wrexham). Loaches: 1, Mr. and Mrs. Muckle (Sandgrounders); 2, Mr. and Mrs. Burton (Blackburn); 3, B. and B. Booker (Sandgrounders). Sharks: 1, Mr. Avery (Mersey-

side); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, T. Hampton (Dunlop). Flying Foxes: 1, E. Hampson (Wythenshawe); 2, Mrs. Vaissiere (Merseyside); 3, A. Jenkinson (Sandgrounders). A.V. Female Fish: 1, S. Brewis (Farnworth); 2, Mr. and Mrs. Houghton (Southport); 3, T. Hampton (Dunlop). Livebearers (Pairs): 1, C. Norton (Sandgrounders); 2, B. W. Carter (St. Helens); 3, C. Evason (Sandgrounders). Egglayers (Pairs): 1 and 3, K. Kryger (Wrexham); 2, A. Vaissiere (Merseyside). Breeders (Livebearers): 1, B. W. Carter (St. Helens); 2, A. Maneer (Sandgrounders); 3, Mr. and Mrs. Bond (Sandgrounders). Breeders (Egglayers Easy): 1, A. Buckley (Bury); 2, K. Kryger (Wrexham); 3, Mr. Avery (Merseyside). Breeders (Eggsayers Hard): 1 and 3, S. Wolstenholme (Heywood); 2, S. Squirrell (Wythenshawe). A.O.V. Tropical: 1, B. and B. Booker (Sandgrounders); 2, C. Evason (Sandgrounders); 3, D. Gomery (Dunlop). Common Goldfish: 1, Mr. Dawson (Heywood); 2 and 3, C. Whitsey (Accrington). Fancy Goldfish: 1, Mrs. Taylor (Merseyside); 2, Mr. Barlow (Osram); 3, C. Whitsey (Accrington). A.O.V. Coldwater: 1, G. Harvey (Sandgrounders); 2, Mr. Dawson (Heywood); 3, D. Harvey (Sandgrounders). Juniors Livebearers: 1 and 3, M. and N. Rimmer (Sandgrounders); 2, Miss J. Sey (Dunlop). Juniors Egglayers: 1, T. Brown (Warrington); 2, T. Cooper (Dunlop); 3, B. Lees (Ashton under Lyne). Ladies: 1, Mrs. B. Sey (Dunlop); 2, Mrs. Stock (Farnworth); 3, Mrs. Lilley (Dunlop). Marines: 1 and 2, D. and D. Shaw (Dunlop); 3, Mrs. E. Davies (Dunlop). Mini-Jars: 1 and 2, E. Jones (Wrexham); 3, M. and N. Rimmer (Sandgrounders). Total number of entries, 655. Best Fish in Show, M. Mason (Farnworth). Exhibitor with most points, K. Kryger. Society with most points, Sandgrounders.

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IN July, **Brize Norton A.S.** held their meeting at the new venue. The meeting was well attended and the programme of events for the coming year was accepted by members.

Among the events planned for the rest of the year is a combined evening with Abingdon A.S., and a talk, accompanied by a slide show by Mr. D. Blundell and Mr. C. Osbourn, on making all-glass tanks and fish photography. The club is also planning a coach trip to visit the Belle Vue show in October.

New members are welcome to the very informal meetings, every other Tuesday evening at 8 p.m. in the Lord Kitchener at Curbridge, Oxon. Anyone wishing more information please write or call on D. Tovey, 28 Northolt Road, Carterton, Oxon.

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AN inter-society show was held by **Scunthorpe & District A.S.** with South Humberside. The entries were judged by Mr. F. Toyne and Mr. G. S. Hill. The results of the Show were as follow: Guppies: 1, N. Kershaw; 2, K. Atkinson. Mollies: 1, P. Smith; 2, Mr. and Mrs. Tyson; 3, Mr. and Mrs. Campbell. Swordtails: 1, N. Kershaw; 2, Mr. and Mrs. Berry; 3, Mr. and Mrs. Tyson. Platies: 1, D. Hill; 2, Mr. and Mrs. Dinsdale; 3, Mr. and Mrs. Tyson. A.O.V. Livebearer: 1 and 3, M. Toyn; 2, G. Storrs. Characins: 1 and 3, Mr. Watts; 2, D. Hill. Barbs: 1, Mrs. A. Liens; 2, Mr. Watts; 3, Mr. and Mrs. Tyson. Angels: 1, G. Storrs; 2 and 3, H. and W. Drurey. Rift Valley Cichlids: 1, Mr. Parker; 2, Mr. and Mrs. Burr; 3, Mr. and Mrs. Berry. A.O.V. Cichlids: 1, G. and B. Wressell; 2, A. Jordan; 3, Mr. and Mrs. Burr. Fighters: 1 and 2, Mr. and Mrs. Lake; 3, Mr. and Mrs. Davey. A.O.V. Anabantid: 1, Mr. and Mrs. Burr; 2, G. and B. Wressell; 3, H. and W. Drurey. Sharks and Foxes: 1, M. Toyn; 2, A. Bottomley; 3, P. Smith. Rasboras, Danios, Minnows: 1 and 3, Mr. and Mrs. Lake; 2, N. Kershaw. Loaches: 1, G. and B. Wressell; 2, G. Allen; 3, M. Toyn. A.V. Catfish: 1, Mr. and Mrs. Lake; 2, G. and B. Wressell; 3, G. White. A.O.V.: 1, Mr. and Mrs. Burr; 2, Mr. and Mrs. Berry; 3, Mr. and Mrs. Lake. Best in Show trophy went to Mr. and Mrs. Lake of South Humberside A.S. with a Rasbora maculata and Scunthorpe and District won the show by 54 points to 47.

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ALTHOUGH it was only the second attempt by the **Uxbridge & District A.S.** at putting on an exhibition of fishkeeping at the Hayes Carnival there was no doubt it was a great success.

Great interest was shown in the display of the smallest livebearers, Mosquitoes, and the smallest egglayers, Rasbora Maculata. A pair of Swordtails with their offspring also created an interest.

A coach outing to Eastbourne was marred by dismal cloudy weather, but nevertheless club members and friends who made the trip thoroughly enjoyed themselves. A talk by various members on fish house construction and management proved very popular.

Members at the last meeting brought fish along and Federation judge P. Ginger discussed the good and bad points of each exhibit and all agreed it was a very instructive evening. Inter-club shows against Hendon and High Wycombe have also been arranged.

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THE **Runnymede A.S.** Open Show was a great success, with a total of 629 entries from 27 clubs. Best Fish In Show trophy and the Aquarist gold Pin was won by Mrs. Sylvia Parish, Hounslow and M. Strange, Basingstoke won the highest entered Class CA with 47 entries. Sudbury A.S. took the highest pointed society trophy with 63 points. Full details are as follow: Class AK: 1, J. Shepherd, Runnymede. Class AG: 1, R. J. Hard, Haslemere; 2, R. Paine, Haslemere, 3, T. Butler, Runnymede; 4, G. A. Berrett, Newbury. Class BA: 1 and 4, K. Smith, Runnymede; 2, A. Chaplin, Basingstoke; 3, R. F. Adams, Salisbury. Class BZ: 1, Mrs. P. Newbury, Gosport; 2, Mrs. D. Cruickshank, Ealing; 3, W. and S. Banbury; 4, T. Burvill, Basingstoke. Class CA: 1, M. Strange, Basingstoke, 2, J. Shepherd, Runnymede; 3, R. G. Cox, High Wycombe; 4, D. M. Reilly, Runnymede. Class CB: 1, G. A. Lucas, Sudbury; 2, C. and J. Richards, Sudbury; 3, E. C. Fantham, Sudbury; 4, C. W. Lucas. Class CZ: 1, W. and S. Banbury; 2, T. Lecuirot, Roehampton; 3, R. F. Adams, Salisbury; 4, A. Phillip, Vauxhall. Class DZ: 1, R. Plume, Symonds; 2, W. A. Knight, Gosport; 3, T. Fraser, Basingstoke; 4, R. F. Adams, Salisbury. Class DB: 1 and 2, Mrs. P. Newbury, Gosport; 3, M. Carter, Southampton; 4, D. Parrott, Runnymede. Class DC: 1, W. A. Knight, Gosport; 2, K. E. Taylor, Havant; 3, A. C. Tracey, Gosport; 4, T. Butler, Runnymede. Class EA: 1 and 4, A. Thacker, Vauxhall; 2 Foxley Brown, Roehampton; 3, C. Goddard, Sudbury. Class EZ: 1, Mrs. Parish, Hounslow; 2, R. F. Adams, Salisbury; 3, H. Nicholls, Runnymede; 4, C. J. Lucas, Sudbury. Class Fc-f: 1, and 3, D. M. Reilly, Runnymede; 2, R. Hall, Sudbury; 4, M. Strange, Basingstoke. Class FZ: 1, D. M. Reilly, Runnymede; 2, K. Usher, Doncaster; 3, W. West, Salisbury; 4, E. and T. Tester, Mid-Sussex. Class G: 1, E. Fantham, Sudbury; 2, T. Cruickshank, Ealing; 3, Mrs. Raggett, Ind.; 4, W. A. Knight, Gosport. Class H: 1, K. E. Taylor, Havant; 2, P. Moye, Sudbury; 3, T. Cruickshank, Ealing; 4, T. Fraser, Basingstoke. Class J: 1, L. J. Brazier, Sudbury; 2, A. I. Feast, Tonbridge; 3, E. Fantham, Sudbury; 4, W. Mason, Roehampton. Class K: 1, M. Strange, Basingstoke; 2 and 3, B. Moye, Sudbury; 4, R. Onslow, Basingstoke. Class L: 1 and 2, C. Kislingbury, Runnymede; 3 and 4, A. C. Tull, Salisbury. Class MZ: 1, L. J. Brazier, Sudbury; 2, C. Kislingbury, Runnymede; 3, G. A. Lucas Sudbury; 4, Mr. Shirley Haslemere. Class MA: 1, E. Fantham, Sudbury; 2, E. Tester, Mid-Sussex; 3, T. W. and J. A. Ramshaw, Brighton; 4, J. Hughes, Roehampton. Class Nb-m: 1, W. and S. Banbury; 2, R. Houghton, Brighton; 3, C. W. Goddard, Sudbury; 4, A. Chaplin, Basingstoke. Class No-t: 1 and 3, K. Usher, Doncaster; 2, T. Fraser, Basingstoke; 4, R. J. Hard, Haslemere. Class O: 1, R. J. Hard, Haslemere; 2, W. West, Salisbury; 3, A. E. Noronha, Orpington; 4, Mrs. P. P. Hard, Haslemere. Class P: 1, C. and J. Richards, Sudbury; 2, A. E. Noronha, Orpington; 3, J. Randall, Haslemere; 4, D. Longford, Haslemere. Class Q: 1, E. Fantham, Sudbury; 2, T. Fraser, Basingstoke; 3, K. Usher, Doncaster; 4, A. E. Noronha, Orpington. Class R: 1 and 2, A. E. Noronha, Orpington; 3, F. M. Hoppenbrouwer, Hounslow; 4, W. A. Knight, Gosport. Class S: 1, C. J. Lucas, Sudbury; 2, Mrs. D. Cruickshank, Ealing; 3, R. Cripps, Newbury; 4, D. Longford, Haslemere. Class T: 1, A. Thacker, Vauxhalls; 2, T. Burvill, Basingstoke; 3, K. Doswell, Havant; 4, K. Usher, Doncaster. Class Xb-m: 1, M. Strange, Basingstoke; 2, A. E. Noronha, Orpington; 3, P. Moye, Sudbury; 4, R. G. Cox, High Wycombe. Class Xo-t: 1, 2 and 3, K. Usher, Doncaster; 4, H. Carter, Southampton. Class Z: 1, 2, 3 and 4, J. Hughes, Roehampton.

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THE July meeting of **Weymouth A.S.** was entertained to a showing of R. Essons "Non-V. Goldfish," which is well worth seeing. The table show Coldwater places were all taken by J. Hodder as he won the 1st, 2nd, 3rd and 4th awards.

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RESULTS of **Brighton & Southern A.S.** Open Show were as follow: Class Ad: 1, M. Goss (Riverside); 2, R. Paine (Haslemere); 3, R. J. Hard (Haslemere); 4, D. Langford (Haslemere). B: 1, B. Nichols (Mid-Kent); 2, B. F. Sayer (Brighton); 3, Mrs. P. Newbury (Gosport); 4, D. Cruickshank (Ealing). C: 1, J. Brown (Croydon); 2, P. Lambourne (Riverside); 3, P. W. Cottle (North Kent); 4, R. Paine (Haslemere). Ca: 1, J. F. Horsley (Godalming); 2, L. Goff (Orpington); 3, K. F. Stevens (Brighton); 4, A. I. Feest (Tonbridge). Cb: 1 and 3, P. W. Cottle (North Kent); 2, D. Winder (East Dulwich); 4, J. A. Lucas (Sudbury). D: 1, T. and J. Ramshaw (Brighton); 2, M. Nethersell (Riverside); 3, B. F. Sayers (Brighton); 4, A. Smith (Hounslow). Db: 1, Mrs. P. Newbury (Gosport); 2, B. Nichols (Mid-Kent); 3, V. Varley (Ealing); 4, M. Carter (Southampton). Dc: 1, W. A. Knight (Gosport); 2, R. A. Todman (Horsham); 3, R. Houghton (Brighton); 4, K. Connorley (Gosport). E: 1, S. Parrish (Hounslow); 2, G. D. Saunders (Tonbridge); 3, S. Bartlett (Sudbury); 4, Mr. and Mrs. B. Fry (North Kent). Ea: 1, F. W. Woodward (North Kent); 2, L. Brazier (Sudbury); 3, C. W. Goddard (Sudbury); 4, C. and J. Richards (Sudbury). F: 1, A. Weaire (Southampton); 2, A. P. Constantine (Hounslow); 3 and 4, G. Sandford (Redhill and Reigate). G: 1, B. Nichols (Mid-Kent); 2, G. Dickinson (Havant); 3, G. Briggs (Riverside); 4, F. J. Farnall (Tonbridge). H: 1 and 2, N. Nethersell (Riverside); 3 and 4, K. E. Taylor (Havant). J: 1 and 4, A. I. Feest (Tonbridge); 2, P. W. Cottle (North Kent); 3, L. Brazier (Subdury). K: 1 and 2, D. L. Winder (East Dulwich); 3, T. Moulton (Godalming); 4, C. P. Berry (Mid-Sussex). L: 1, B. Nichols (Mid-Kent); 2, K. Groves (Horsham); 3, A. E. Noronha (Orpington); 4, Mr. Reffe (L.B.A.S.). M: 1, K. Connerly (Gosport); 2, L. Brazier (Sudbury); 3, D. Lambourne (Riverside); 4, G. Biggs (Riverside). Nb-m: 1 and 4, R. Houghton (Brighton); 2, L. Brazier (Sudbury); 3, A. E. Noronha (Orpington). No-T: 1, A. E. Weaire (Southampton); 2, V. Varley (Ealing); 3, J. S. Randall (Haslemere); 4, D. Chesswright (Southend). O: 1, L. Jones (Bracknell); 2, 3 and 4, J. S. Randall (Haslemere). P: 1, and 2, C. J. Richards (Sudbury); 3, J. Horsley (Godalming); 4, C. D. Finniss (Stroud). Q: 1, T. Lecuirdt (Roehampton); 2, A. E. Noronha (Orpington); 3 and 4, J. Healey (Ealing). R: 1, C. D. Finnis (Stroud); 2, J. A. Lucas (Sudbury); 3, Mr. and Mrs. Kenwood (Brighton); 4, Mrs. P. Newbury (Gosport). S: 1, D. Cruickshank (Ealing); 2, A. E. Cully (Hounslow); 3, E. and

T. Tester (Mid-Sussex;) 4, C. W. Goddard (Sudbury). T: 1, J. H. Preston (Southend); 2, D. B. Purchard (Tenbridge); 3 and 4, A. E. Weaire (Southampton). Xb-m: 1, J. D. Dickinson (Havant); 2, A. B. Noronha (Orpington); 3, M. C. Spearshott (Mid-Sussex); 4, R. W. Durce (Orpington). Xo-T: 1 and 2, D. M. Chesswright (Southend); 3, A. E. Noronha (Orpington); 4, C. Bellingham (Tonbridge). Ua-b: 1 and 4, L. A. Yates (Petersfield); 2, H. Gardener (Redhill & Reigate); 3, Mr. and Mrs. B. Fry (North Kent). Uc-d: 1, Mr. and Mrs. B. Fry (North Kent); 2, W. F. Woodward (North Kent). V: 1, Mr. and Mrs. B. Fry (North Kent); 2 and 3, H. Gardener (Redhill & Reigate). W: 1 and 2, Mr. and Mrs. B. Fry (North Kent); 3, R. Parker (North Kent); 4, H. Gardener (Redhill & Reigate). Best in class Q-T: J. H. Preston (Southend). Best Fish in Show: Mrs. S. Parrish (Hounslow). Best Exhibitor: Mr. and Mrs. B. Fry (North Kent). Best Exhibiting Society: North Kent.

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AFTER a lapse of two years, **Kingston and District A.S.** returned to the open show scene, an event which proved extremely successful, and which attracted 377 entries.

The judges were Mr. A. Blake; Mr. R. Fox; Mr. R. Forder (Plants); Mr. D. Lamboird; Mr. W. Ryder and Mr. J. Skillwell. The results were as follow:— B.A: 1, M. West, K.D.A.S.; 2, E. and T. Tester, Mid-Sussex; 3, G. Owen, B.K.A.; 4, J. Hughes, Roehampton. BZ: 1, Ivy Onslow; 2 and 3, B. Sayer, Brighton A.S.; 4, D. Cruickshank, Ealing. CA: 1, S. Hard, Haslemere; 2, B. Sayers, Brighton, A.S.; 3, M. West, K.D.A.S.; 4, G. Lucas, Sudbury. CZ: 1, M. West, K.D.A.S.; 2, S. Pope, Croydon; 3 and 4, E. and T. Tester, Mid-Sussex. DA: 1, E. and T Tester, Mid-Sussex; 2 and 3, H. J. Foxley-Brown, Roehampton; 4, D. Lambert, K.D.A.S. DB: 1 and 4, J. Owen, B.K.A.; 2, W. F. Sutton. Catfish; 3, K. Groves, Horsham. DC: 1, 2 and 3, R. Houghton, Brighton A.S.; 4, S. Pope, Croydon. DZ: 1 and 4, May Nethersell, Riverside; 2, B. Sayers, Brighton A.S.; 3, B. Smith, K.D.A.S. EA: 1 and 2, C. and J. Richards, Sudbury; 3, R. Shirley, Haslemere; 4, H. J. Foxley-Brown, Roehampton. EZ: 1, J. Hughes, Roehampton; 2, B. Manning, Roehampton; 3, Miss K. Sayers, Brighton; 4, S. Bardett, Sudbury. F: 1, Gina Sandford, Reigate and Redhill; 2 and 4, J. Ellis, K.D.A.S.; 3, G. Owen, B.K.A. G: 1 and 2, W. Onslow, Ealing; 3, W. F. Sutton, Catfish; 4, M. West, K.D.A.S. H: 1, 2 and 3, May Nethersell, Riverside; 4, E. Lough, K.D.A.S. J: May Nethersell, Riverside; 2, C. Richards, Sudbury; 3, J. Hughes, Roehampton; 4, C. Lewis, Roehampton. K: C. McKay, Sudbury; 2, L. Derrick, Croydon; 3, E. Lough, K.D.A.S. L: 1 and 4, K. Groves, Horsham; 2, E. and T. Tester, Mid-Sussex; 3, M. Sandford, Reigate and Redhill. M: 1, May Nethersell, Riverside; 2, L. Jones, Bracknell; 3, C. Lucas, Sudbury; 4, W. Onslow, Ealing. N(b-m): 1, E. and T. Tester, Mid-Sussex; 2, J. Ellis, K.D.A.S; 3, C. Wood; 4, S. Bardett, Sudbury. N(o-t): 1 and 2, J. Ellis, K.D.A.S.; 3, H. J. Foxley-Brown, Roehampton; 4, B. Lough, K.D.A.S. O: 1, L. Jones, Bracknell; 2, C. Lucas, Sudbury; 3, E. and T. Tester, Mid-Sussex; 4, Randell, Haslemere. P: 1, 2 and 3, G. Richards, Sudbury; 4, S. Bartlett, Sudbury. R: 1, A. Marshall, Basingstoke; 2, P. Reff, K.D.A.S.; 3, J. Randell, Haslemere; 4, C. Lewis, Sudbury. S: 1 and 3, E. and T. Tester, Mid-Sussex; 2 and 4, T. Lecuiroe, Roehampton. T: K. Dryden, Croydon; 2, 3 and 4, N. Winford, Croydon. UA: 1, 2 and 3, F. Pinder; 4, A. Marshall, Basingstoke. UB: 1, D. Herman, Spass; 2, M. Dudley, Spass; 3 and 4, Mr. Pope, Croydon. V: 1, H. Gardener, Reigate and Redhill; 2 and 4, H. Marshall, Basingstoke; 3, J. Pollard, K.D.A.S. W: 1, J. Owen, B.K.A.; 2, R. Herman, Spass; 3, G. Owen, B.K.A.; 4, M. Dudley, Spass. X(b-m): 1, Gina Sandford, Reigate and Redhill; 2 and 4, K. Groves, Horsham; 3, D. Lambert, K.D.A.S. X(o-t): 1, C. McKay, Sudbury; 2, B. Lough, K.D.A.S.; 3, D. Lambert, K.D.A.S.; 4, K. Dryden, Croydon. X(u-w): 1 and 2, F. Pinder; 3 and 4, G. Herring, Spass. ZA: 1 and 4, J. Hughes, Roehampton; 2, M. Dudley, Spass; 3, R. Shirley, Haslemere. ZB: 1, 2 and 4, J. Hughes, Roehampton; 3, B. Lough, K.D.A.S. ZC: 1, 2 and 4, J. Hughes, Roehampton; 3, E. Lough, K.D.A.S.

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AT the July meeting members of the **Bishops Cleeve A.S.** enjoyed an interesting talk by Mr. T. Collier on breeding angels.

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RESULTS of the inter-club show between **Horsforth A.S.**, Aireborough and Swillington in July were as follow: Breeders (Jiggiayers): 1, Mr. Seaman (Swillington); 2 and 3, Mr. Nichols (Swillington). Guppies: 1 and 2, Mr. and Mrs. Hislop (Swillington); 3, Mr. Tiffany (Swillington). Rasbora, Carps, Danios and Minnows: 1, G. Parkin (Swillington); 2, S. Hall (Aireborough); 3, D. Stead (Swillington). Breeders (Livebearers): 1, J. Abbot (Swillington); 2, Mr. Hislop (Swillington); 3, P. Smith (Horsforth). Cichlids: 1, D. Stead (Swillington); 2, P. Smith (Horsforth); 3, Mr. and Mrs. Hislop (Swillington). Catfish and Loaches: 1, S. Hall (Aireborough); 2, Mr. Tiffany (Swillington); 3, A. Hardcastle (Horsforth). Best in Show: S. Hall (Aireborough). Society points: Swillington, 27 pts.; Aireborough, 5 pts.; Horsforth 4 pts.

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IN an effort to save time at their monthly committee meetings the **Great Yarmouth & District A.S.** are experimenting with a series of sub-committee meetings. The sub-committee, comprising four committee members, meet independent of normal meetings with the directive to investigate a given section of the clubs activities and report back to the full committee with its findings and recommendations for improvements. These measures have proved necessary with the welcome and steady flow of new members and the subsequent increase in club activities.

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EARLY in July the **Southern Independent A.S.** held a small quiz with Colin Pannell in the chair and also a table show, the result of which was as follow: Class E: 1 and 2, Fay Obbard junior; 3 and 4, Mrs. A. Adams. Class H: 1, Mrs. A. Adams; 2 and 3, C. Pannell. The new show secretary is Mrs. Grace Coleman.

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THE **Chelmsford A.S.** meet the first Tuesday in each month at the basement of the Civic Centre, Chelmsford. They are currently making preparations for their first open show, and extend a welcome to any aquarist to join them in this and many other activities throughout the coming year. Enquiries to I. R. Fountain, 10 Brocrave Close, Chelmsford, Essex.

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IN July **Llantwit Major A.S.** held their annual general meeting. In his report the chairman, J. Thomson, reminded all present that it was 22 years ago when the society was first formed. The new committee was then elected as follows: Chairman, J. Thomson; Vice-Chairman, N. Haley; Secretary, R. Newton, 8 The Glen, Bryncethin, Bridgend, Mid Glam.; Treasurer, H. Chick; Show Secretary, J. J. Edwards; Assistant Show Secretary, Master J. Edwards; Librarian, G. Lewis; P.R.O., H. Chick; Sales Manager, L. Dyson; C.N.A.A. Delegates, A. Ibbertson/J. Thomson; P.B.A.S. Delegate, Mrs. J. Edwards.

Results of the table show were:—Class N, Sexed Pairs, judged by G. Lewis: 1, J. Thomson; 2, Master J. Edwards; 3, M. Guthrie; 4, H. Chick. K.O.: 1 and 2, J. Thomson; 3 and 4, B. Lloyd.

The meeting place of the society is The Red Dragon, St. Athan, on the second Tuesday of each month, at 7.30 p.m. All are welcome.

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THE **British Aquarist Study Society** is holding the annual general meeting conference on 4th October at the Zoological Society Headquarters Regent's Park.

The afternoon conference starts at 2.15 p.m. when a symposium will be held on the Livebearing Toothcarps. The main speaker is Mr. James Chambers of the Natural History Museum. Tickets are £1.25 each and this charge includes tea. Tickets are available from: Mr. A. F. Keens, Highcliffe, Old Hill, Woking, Surrey.

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THE first half of the **Suffolk Aquarist and Pondkeepers Association** July meeting was taken up with amending all rules and an auction of some club equipment. The club president then gave a talk to the members on the new thermostats and heaters that are now available, and the proceedings were concluded with a discussion on fish and showing fish.

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THERE were 473 entries for the **Hinckley & District A.S.** Open Show which was a record for the society, and the winners were as follow: A.V. Guppy: 1, L. A. Humphreys (Corby); 2, C. J. Richards (Sudbury); 3, Mr. and Mrs. Chambers (Wellingborough); 4, Mr. and Mrs. Crow (Wellingborough). A.V. Molly: 1, L. W. Poole (Banbury); 2, J. T. F. Mayle (Chelmsley); 3, Mr. and Mrs. Chambers (Wellingborough); 4, Mr. and Mrs. Crow (Wellingborough). A.V. Platy: 1, S. T. F. Mayle (Independent); 2 and 4, Mr. and Mrs. Chambers (Wellingborough); 3, L. W. Poole (Banbury). A.O.V. Livebearer: 1, 2 and 3, S.M.I.N. (Nuneaton); 4, K. Payne (North Warwick). Small Characin: 1 and 3, C. J. Richards (Sudbury); 2, Mr. and Mrs. Chambers (Wellingborough); 4, C. Michelson (Goodyers End). A.O.V. Characin: 1, R. Phillips (M.T.A.); 2, M. Nightingale (T.K.A.S.); 3, S. T. F. Mayle (Independent); 4, B. and F. Hurst (Coventry). Small Barbs: 1 and 2, K. Done (Independent); 3, R. Clarke (Independent); 4, S. T. F. Mayle (Independent). A.O.V. Barbs: 1 and 4, J. T. F. Mayle (Chelmsley); 2, R. Phillips (M.T.A.); 3, J. Turner (T.K.A.G.). Dwarf Cichlid: 1, T. Redfern (Nuneaton); 2, S. Ward (Banbury); 3, K. Done (Independent); 4, Mr. and Mrs. Chambers (Wellingborough). Angel Fish: 1, G. and M. (Independent); 2, Mr. and Mrs. Chambers (Wellingborough); 3, Mr. and Mrs. Crew (Wellingborough); 4, M. Moore (Hinckley). A.O.V. Cichlid: 1, K. Grey (Jones & Shipman); 2, N. Coleman (Wellingborough); 3, R. Phillips (M.T.A.); 4, M. Nightingale (T.K.A.S.). Siamese Fighting Fish: 1, C. Pratt (Bedworth); 2, M. Brainbridge (Jones & Shipman); 3, C. J. Richards (Sudbury); 4, A. Hancox (T.K.A.G.). A.O.V. Anabantid: 1, R. A. Cleaver (Coventry); 2, R. Phillips (M.T.A.); 3, G. and M. (Independent); 4, S. Burdet (Sudbury). Corydoras and Brochis Catfish: 1 and 2, T. Fuller (Uttoxeter); 3, G. and M. (Independent); 4, M. Brainbridge (Jones & Shipman). A.O.V. Catfish: 1, S. T. F. Mayle (Independent); 2, J. Goodwill (S.A.S.S.); 3, M. Nightingale (T.K.A.G.); 4, B. C. Roberts (Solihull). A.V. Loach: 1 and 3, R. Phillips (M.T.A.); 2, S.M.I.N. (Nuneaton); 4, K. Done (Independent). A.V. Egglaying Toothcarp: 1 and 3, G. Steed (T.K.A.G.); 2, B. and F. Hurst (Coventry); 4, S.M.I.N. (Nuneaton). A.V. Rasbora: 1, B. Sandercock (Goodyers End). 2, M. Nightingale (T.K.A.G.); 3, G. Michelson (Goodyers End); 4, R. A. Cleaver (Coventry). A.V. Danio: 1 and 4, E. A. Humphreys (Corby); 2, Miss H. Cox (Nuneaton); 3, S. Bostock (Loughborough). Egglayer (Pairs): 1 and 4, Mr. and Mrs. Chamberlain (Leamington); 2, S. Ward (Banbury); 3, G. Lindsay (Loughborough). Livebearer (Pairs): 1 and 2, S.M.I.N. (Nuneaton); 3, T. Redfern (Nuneaton); 4, M. Coleman (Wellingborough). Egglayer (Broods): 1, Mr. and Mrs. G. Cox (Nuneaton); 2, B. and F. Hurst (Coventry); 3, Mr. and Mrs. Crew (Wellingborough); 4, S. T. F. Mayle (Independent). Livebearer (Broods): 1, B. and F. Hurst (Coventry); 2, J. Turner (T.K.A.G.); 3, M. Brainbridge (Jones & Shipman); 4, E. A. Humphreys (Corby). A.O.V. Tropical: 1, K. Done (Independent); 2 and 3, M. Nightingale (T.K.A.G.); 4, Mr. and Mrs. Chamberlain (Leamington). A.V. Junior (Tropical): 1, R. Dickenson (T.K.A.G.); 2, Miss R. Short (Nuneaton); 3, K. Grey (Jones & Shipman); 4, Garry Chamberlain (Leamington). Single Tailed Goldfish: 1 and 2, Mr. and Mrs. Crew (Wellingborough); 3, C. Pratt (Bedworth), 4, J. Turner (T.K.A.G.). Twin Tailed Goldfish: 1, G. and M. (Independent); 2, C. Pratt (Bedwoeth); 3, S.M.I.N. (Nuneaton). Pond and River Fish: 1 and 3, C. Pratt (Bedworth); 2 and 4, S.M.I.N. (Nuneaton).

PERSONAL

THE **Catfish Association of Great Britain** would like to contact Mr. Guest, formerly of Hampstead A.S. rather urgently and request that he writes to Mr. A. Haley, Secretary, 255 Lewisham Way, London SE4 as soon as possible.

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SECRETARY CHANGES

Harlow A.S. R. Vandersteen, 6 Coppice Hatch, Harlow, Essex.

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SHOW CANCELLATION

Due to circumstances beyond their control, **Bishop Auckland A.S.** Annual Open Show, scheduled for September has had to be cancelled.

Due to unforeseen circumstances, **Nuneaton A.S.** have had to cancel their Open Show which was to have been held on 7th September.

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RETURN OF TROPHIES

SOME of the trophies won at the last open show of the **Glossop A.S.** have still to be returned. Will the holders please send them to the show secretary Mr. S. Turner, 56 Arundel Street, Glossop, Derbys. as they are now required.

* * *

AQUARIST CALENDAR

6th September: Federation of British Aquatic Societies General Assembly, Conway Hall, Red Lion Square, Holborn, London, W.C.1. 2.30 p.m.

7th September: Bethnal Green A.S. Open Show to be held at The Bethnal Green Institute, 229 Bethnal Green Road, E.2. Schedules and further details available from the Show Secretary, Sybil Hedges, "Koi Kornor," 150 Ashburton Ave; Seven Kings, Ilford, Essex, IG3 9EL. Tel.: 01-590 3239.

7th September: Killingworth Aquarist Association First Open Show at "Communicare," Killingworth, Newcastle. Schedules from, D. B. Hickman, 14 Crumstone Court, Longmeadows, Killingworth, Newcastle NE12 6SZ.

7th September: Wellingborough and District A.S. Open Show Weavers Sport Centre, Weavers Road, Wellingborough. Schedules from D. Bitchenor, 1A, George St., Wellingborough.

7th September: Buxton and District A.S. Open Show, Pavilion Gardens, Buxton. Judges P.N.A.S., and points gained will be awarded to the League. Further details from Mr. Gullane, 18 Derwent Road, Buxton, Derbyshire.

7th September: Nuneaton A.S. Open Show, Friary Youth Centre, Abbey Street, Nuneaton, Warks. Schedules from show secretary, M. Short, 8 Greenhill Road, Stoke Golding, Nuneaton, Warks. CV13 6HJ.

7th September: Bishops Cleeve A.S. open show at the Community Centre, St. Marks, Cheltenham. Show secretary, Mrs. J. Bishop, 36 Clarence Square, Cheltenham.

13th September: Malvern & District A.S. Second Open Show to be held at Barnards Green Cricket Club, North End Lane, Malvern. Schedules available later.

13th September: Bristol A.S. Coldwater Show. Schedules from show secretary, E. N. Bowden, 12 Stonleigh Walk, Knowle, Bristol BS4 2RL. Tel.: 775355.

14th September: Torbay A.S. will be holding its Seventh Annual Open Show at the Torquay Town Hall. Show schedules will be available from Mr. J. R. Davis, 43 Haldon Road, Torquay Devon.

14th September: Hoylake A.S. 28th open show at Y.M.C.A., Market Street, Hoylake, Merseyside. Show secretary, Mr. D. W. Morris, 9 Pump Lane, Greasby, Merseyside L49 3PW.

14th September: Three Counties Group 21st Annual Open Show run by the Basingstoke, Bracknell, Didcot, High Wycombe and Reading A.S.'s at the Reading University, with 50 classes which will include a 'specialist' Killie Show. Schedules from, R. Leslie, 29 Meadow Walk, Tylers Green, High Wycombe, Bucks, HP10 8DG, or M. Strange, 10 Loddon Court, Neville Close, Basingstoke, Hants.

14th September: Cleveland A.S. annual Open Show at the Guisborough Parish Church Hall, Whitby Road, Guisborough (same venue as last year). Schedules will be available later, from the show secretary, R. W. Begg, 35 Tyreman Street, Lingdale, Saltburn, Cleveland TS12 3ES.

14th September: Harlow A.S. open show at Moot Hall, Harlow. Show secretary Mr. S. Jordon, 48 Whitewaites, Harlow, Essex.

14th September: Barnsley T.F.S. annual open show at Mapperwell Staincross Village Hall, Staincross, Barnsley.

20th-21st September: Littlehampton and Bognor A.S. will be holding its annual two-day exhibition at Bognor Regis.

20th-21st September: Dublin Aqua Show, organised by the Borough Aquarists Society, The Dublin Society of Aquarists and The Irish Tropical Fish Society at the Oblate Hall, Inchicore, Dublin 8. Show schedules and details from hon. show secretary, Maurice Cassidy, 357, The Donaghies, Grange Road, Raheny, Dublin 5.

21st September: Hastings and St. Leonards A.S. Third Open Show at Ore Centre. Show schedules and further details from, P. Martin, 20 Silverlands Road, St. Leonards-on-Sea, Sussex.

21st September: Hucknall & Bulwell A.S. Annual Open Show. Details to follow.

21st September: Leyne A.S. Open Show, St. Pauls Hall, Scotforth, Lancaster. Show secretary, Mrs. B. Hammond, 30 Wharfedale Road, Lancaster, LA1 5ND.

21st September: Chesterfield and District A.S. annual open show, Clay Cross Social Centre, Chesterfield Road, Clay Cross, nr. Chesterfield, Derby. Exit 29 off M1. Follow signs 4 miles to show. The venue is situated on the A61. Details from show secretary, P. Morton, 56 Salisbury Crescent Newbold, Chesterfield.

21st September: Priory A.S. Tynemouth. Open Show St. Aidans Church Hall, Billy Mill Lane, North Shields. Schedules from W. J. Walton. 25, Rutherford Street, High Howdon, Wallsend, Tyne & Wear. NE28 0AW.

21st September: Zenith A.S. present their first annual open show. Venue Finnigans Hall, Ilston. Benching 12 till 2.00 p.m.

27th September: Goldfish Society of Great Britain Open Show to be held at Sutton Adult School, Benhill Avenue, Sutton, Surrey.

27th September: North Gwent A.S. First Annual Open Show at the Leisure Centre, Ebbw Vale. Schedules from show secretary, J. M. Jones, 2 Little Rhyd, Carmeltown, Ebbw Vale, N. Gwent NP3 3PN.

28th September: Newbury and District A.S. Third Open Show at the Plaza, Market Place, Newbury, Berks. Details and schedules from S. Canning, 6 South End, Thatcham, Newbury, Berks.

28th September: Northampton and District A.S. Open Show at the Drill Hall, Clare Street, Northampton. Show schedules will be available from Mrs. S. Taylor, 25 Rowley Crescent, New Duston, Northampton, NN5 6PU shortly.

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28th September: South Leeds A.S. third annual open show to be held at the Corn Exchange, Leeds. Schedules from J. Austwick, 37 Southcroft Gardens, Belle Isle, Leeds Yorks LS10 3NF.

3-5th October: German Livebearer Association Open Show, Breeding Pairs only. Further details and application forms from DGLZ, 11 Issern, Leistungsschau, Herr Hans Kroger Glockstrasser Weg. (Schule am Baris) 2000, Hamburg 53, West Germany.

4th October: East London Aquatic and Pondkeepers Association Open Breeders' Show. Schedules available from M. Pearson, 42, Parkway, Ilford, Essex.

4th October: Haslemere and District A.S. first Open Show, at the Haslemere Town Hall, Bridge Road, Haslemere, Surrey. Schedules and further details from show secretary, D. Langford, 7 Collyers Crescent, Liphook, Hants GU30 7DA.

5th October: Eboracum Aquarists Open Show to be held at Nunthorpe Grammar School Hall. Enquiries to show secretary, Mr. A. S. Allison, 14 Bewley Street, Bishopthorpe Road, York.

5th October: Second Open Show of the Scunthorpe and District A.S. at the North Lindsey College of Technology Annexe, Cole Street, Scunthorpe. Schedules are now available from L. Burr, 6 Saxby Road, Scunthorpe, South Humberside.

11th-12th October: British Aquarists' Festival, Belle Vue Zoological Gardens, Manchester. Details from G. Cooke, Spring Grove, 33 Field Hill, Batley, Yorks.

12th October: Ilfracombe and District A.S. Open Show at the Ilfracombe Junior School, Princess Avenue as last year. Details from Mrs. S. Lipscomb, 8 Foxbeare Road, Ilfracombe, N. Devon.

12th October: Vauxhall Motors A.S. open show. Schedules from A. D. Philip, show secretary, 15 Hollybush Road, Luton.

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16th November: Bradford & District A.S. annual open show at the East Bowling Unity Club, Leicester Street, Wakefield Road, Bradford, 4 (same venue as last year). Details from show secretary, D. Sugden, c/o 18, Southmere Crescent, Great Horton, Bradford, BD7 3NP.

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