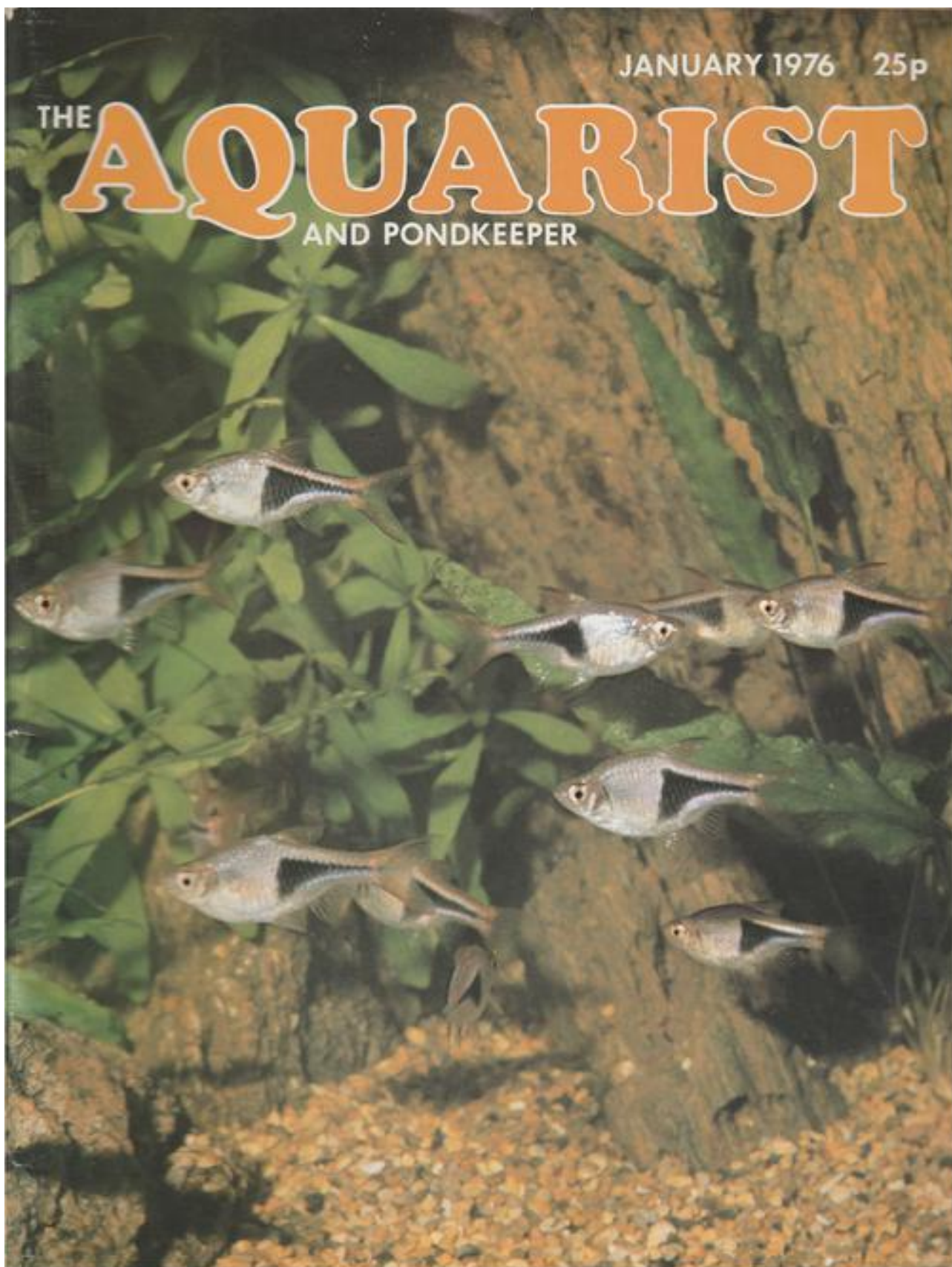


JANUARY 1976 25p

# THE AQUARIST

AND PONDKEEPER





# THE AQUARIST AND PONDKEEPER

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A shoal of Harlequins in a  
furnished aquarium.

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# SPAWNING FIGHTING FISH

by Jorgen & Pamela Hansen

THE fighting fish, *Betta splendens*, has for years been a popular object of trade, not least due to the many pure-bred colour and type variants produced every year by professional breeders, in, for example, Singapore and Hong Kong, thereafter to be sold in the European and American markets in ever-increasing numbers.

The popular name "fighting fish" refers to the aggressiveness of mature males towards each other. If two males which have been held in isolation are then placed together they will fight until at least one dies, the winner generally being so injured that it too dies. In the fish's homeland fights are held between specially chosen males, while the public lay bets as to the result. According to rumour many a house and wife have changed ownership as a result of these bets.

*Betta splendens* comes from further India, where it inhabits stagnant, overgrown waters. Wild fish lack the magnificent finnage characteristic of the cultured forms which dominate the trade, the former being practically impossible to obtain. As soon as the males are sexually mature they live far apart from each other, which is wise considering their aggressive nature. Their native waters are warm (25°C-28°C) and deficient in oxygen. *B. splendens* is a labyrinth fish which surfaces regularly to collect a mouthful of air with which to oxygenate the blood, and is thus specially suited for living in such waters.

It had not, in fact, been our intention to acquire fighting fish but when one of our friends, after having borrowed from near and far in an attempt to find a compatible pair, suddenly got a pair to spawn every time they were placed together, he then presented us with a carefully chosen pair from his breeding efforts so that we too could try our luck.

The male had a reddish-brown cigar-shaped body and red finnage with a bluish shimmer, while the female had an almost white body with red fins. The latter was not pure albino as the eyes were black. Both fish were about a year old when set to spawn.

There can be certain difficulties in obtaining suitable breeding stock, especially suitable males. It is not enough to have a beautiful male with splendid finnage if it turns out that he won't or can't build a bubble nest. A good breeding male will, as a rule with a change of water, begin to build bubble nests even if there are no females in the vicinity. Females with roe can be

recognised by their plump appearance immediately behind the pectorals.

## The Spawning Tank

This is not difficult to furnish as long as you keep in mind that both male and female can be very aggressive to each other if one of the partners refuses to mate. Hiding places should therefore be provided for the indisposed fish.

We chose as our spawning tank a glued glass tank measuring 40×40×30cm. (16×16×12 ins.), with a water height of 20 cm. (8 ins.). The water was ordinary fresh tapwater with a hardness of DH14 and a pH of 7. The temperature was 28°C (82.4°F), and there was neither aeration nor filtration. The bottom was covered by a 2½ cm. layer of gravel, in which grew *Sagittaria*. On the surface floated a single medium-size *Pistia stratiotes*. To create a hiding place for the female before and after spawning we inserted a large handful of hornwort, *Ceratophyllum demersum*, which formed an almost impenetrable thicket.

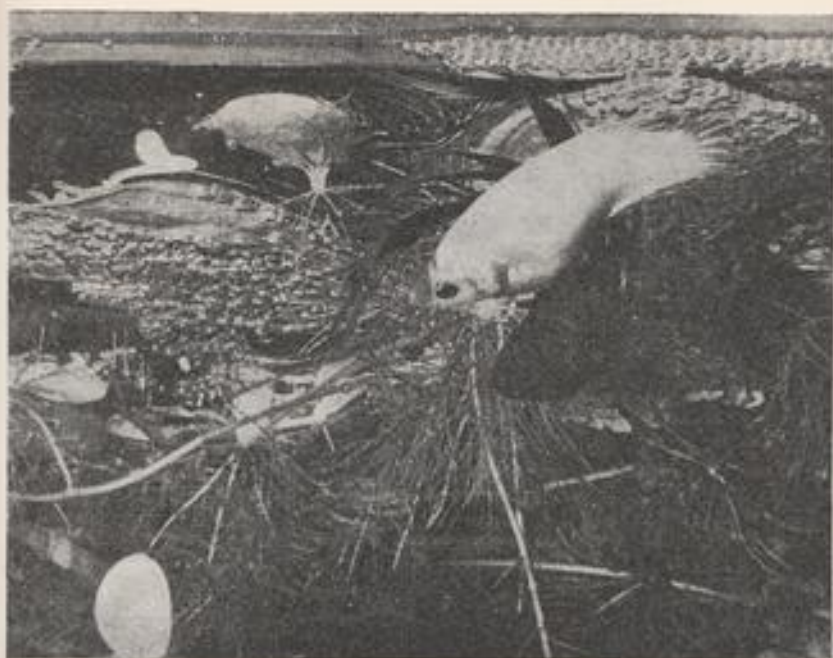
## Spawning

We kept notes on the course of events.

23.10.73. The fish were placed together in the spawning tank, whereupon the female immediately disappeared into the thicket. After an hour or so, the male began to build a bubble nest close to the front glass. He used the *Pistia stratiotes* as anchorage, the main part of the nest being under one of its leaves. Now and then the female left her hide-out but was immediately chased back again by the male, who was apparently not finished with his nest building.

24.10.73. We were able to photograph the spawning, which occurred in the evening. The female swam invitingly over to the male, who spread his fins to show his full splendour. He then bowed his body sideways in a U-form and embraced the female, who bowed her body likewise; both fish thus quiveringly turned belly upwards. This position was held for a couple of seconds, whereafter they slid away from each other. A couple of minutes later the procedure was repeated. We saw no eggs however, and were beginning to doubt that they would ever come, when suddenly they were squeezed out in series of 5-10 at each embrace. They were white and about 1 mm. in diameter, and sank slowly down towards the bottom, whereupon the male

*Continued on page 511*



Above: Male about to embrace Roe-filled female.  
Below: Male on his way down for the eggs.



SPAWN



## *Calotes versicolor*

by H. G. B. Gilpin

THE LATEST EXAMPLE of *Calotes versicolor* to come into my possession was in something of a bad way at the time. Prior to its arrival, in early March, it had shared its accommodation with an adult *Agama agama*. I have always found common Agammas to be reasonably peaceful in a community of other species of comparable size, but in this case disagreement had apparently developed with unfortunate results. The Agama was unharmed but the Calotes suffered damage to both a fore and a hind leg and gave every indication that an early demise might be expected.

Temporary confinement in a small vivarium, maintained at a temperature of 85°F., and an ample and varied supply of insects and larvae however effected an improvement in its condition and it was not long before it was possible to transfer the animal to quarters more suited to its size and habits.

Its permanent home consisted of a glass sided vivarium, three feet in length, fourteen inches wide and fourteen inches high, heated from above by electric light bulbs, set in a domed cover, to a temperature of 75°F. The floor was covered with earth, moss and a few large stones and the vivarium furnished with branches. Water was supplied in a shallow vessel containing a small raft of hard, spongy material designed to provide a rescue station for mealworms bent, as they invariably are, on drowning themselves.

These lizards commonly occur in India, Ceylon and the Malay Peninsula and extend their range into Afghanistan and S. China. They are forest dwellers spending most of their time actively climbing amongst the branches or waiting for insects on boughs, twigs

and fallen tree trunks. The arrival of an insect galvanises the lizards into springing upon their prey and seizing it in their jaws.

Finn states that they have been known to eat small fish thrown in front of them and S. N. Paul, contributing to "What's Your Opinion" in the October 1969 issue of "The Aquarist", mentions that he has known them to eat small earthworms laid on their favourite basking branch. My specimen was fed upon adult stick insects, gentles, mealworms and blow flies, a diet which appeared to suit it admirably.

*Calotes versicolor* is a comparatively large lizard, normally attaining an overall length of fifteen and a half inches, some ten to eleven inches being taken up by the tail. Those found in Ceylon are said to be slightly longer. Mine, not fully adult, measured thirteen inches in total length, the tail occupying nine inches. Its pointed snout is short, the mouth large and the head high. Eyelids are thick and heavy and a low spiny crest extends from the back of the head along the back. The legs are relatively long, the claws strong and the tail slender.

Females and young are basically brown in colour sometimes with variable light and dark markings. The males are capable of dramatic changes of hue. Normally brownish with a yellow neck, under the impact of excitement, induced by rivalry towards other males or the presence of a female during the breeding season, the yellow of the throat brightens and the sides of the head, neck and body become red. The tail and legs darken. This reddening gives rise to the lizard's common names, Indian Bloodsucker and Harlequin Lizard.

In confinement these bright colours tend to disappear. My example remained sombre, only varying from pale yellowish brown in a bright light to dark brown in dull surroundings.

Males become aggressive towards each other during the breeding season and fights are frequent, with considerable ferocity exhibited by both contestants. Successful males display to the females, holding themselves upright on their hind legs with heads weaving to and fro. Rapid colour changes occur, considerable variation being shown. These are often followed by a "fighting" display, like that used to

intimidate other males.

Some four weeks after mating the female produces about a dozen oval, soft shelled eggs, each half an inch in length. These are buried in the soft, rotting debris of a decaying log. After a further eight weeks the eggs hatch and the emerging young set about the business of survival.

Calotes have been described as "shy but will bite when captured," gentle, and agreeable. Personally I have not found them to be particularly nervous. Those I have kept remained calm and apparently indifferent when their vivarium was approached and tolerated cleaning operations and water changing without exhibiting resentment or fear. Initially, the one described above however did become uneasy if an attempt was made to pick it up. It made its feelings abundantly clear by jumping forward at the last moment and sharply biting the intruding hand. Although the performance was somewhat startling until one got used to it, the bite was only mildly painful and no blood was drawn. It was not long before it abandoned this practice altogether and became amenable to ordinary handling.

## SPAWNING FIGHTING FISH

*continued from page 508*

at once deserted his mate and swam down to catch them. He then spat them in amongst the bubbles in the nest. He didn't bother with the eggs which fell to the bottom; these were eaten by snails. The female swam a little away from the nest while the male attached the eggs by means of a few extra bubbles. Thereafter the whole process was repeated. When about 100 eggs had been produced the female lost interest, and was then chased away with the help of a few bites. We removed the female from the tank so that she should not suffer further molestation, nor eat the young later.

For the next couple of days the male took care of the nest, repairing it now and then with a mouthful of bubbles. In the course of 24 hours the eggs turned transparent with a faint pink shimmer.

27.10.73. The fry hung under the nest; the eye pigmentation could clearly be seen. The male now ignored the nest and fry.

29.10.73. The fry swam freely and spread over the whole tank. They looked like small splinters of glass with a tiny black spot, the eye, at one end; length about 3 mm. We moved the male away.

### Feeding up

For the first couple of days the fry were fed with *infusoria* cultured on dried banana peel; and trout food (wettened in a fine net and squeezed between the fingers, the net being dipped afterwards into the appropriate tank where it left a cloud of fine particles).

They were thereafter fed with brine shrimp until in the course of two months they had reached a length of 2-3 cm. and accepted practically all types of food, but grew best on live food especially new born fry.

The young remained in the same tank until the age of 8 months, at which point males and females could be clearly distinguished as the males' finnage was almost three times more extensive than the females'. No fighting occurred between males in this tank, although some could be said to be sexually mature. We sorted out ten of the largest males, however, and placed each in a separate tank of 130 litres, which they shared with 50-100 livebearers such as swordtails, platies and guppies. The fighting fish grew tremendously on a diet of the young of these livebearers. The females were kept together in a tank with 50 large guppy females.

In all, with a week's interval each time, we got three broods from the same pair, constituting 88 young.

Already when the fry were a week old it was possible to see that a number would have the same almost-white body as the mother. The distribution of the three broods was as follows:

	White	Dark	In all
Brood I .. ..	15	18	33
Brood II .. ..	7	15	22
Brood III .. ..	13	20	33
In all .. ..	35	53	88

Those fighting fish with white bodies had either red, white, or blue finnage while those with dark bodies had two types of body colouring, blue with blue fins or red with red fins. Further crosses would be necessary before commenting on the genetics involved.

# WHAT IS YOUR OPINION?

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

*Photographs by the Author*



BEST WISHES for a happy and peaceful new year. I hope that one of your resolutions will be to write at least one letter to this feature in 1976. By so doing you could help the hobby to spread.

No. 89 Coopersale Close, Broadmead Road, Woodford Green, Essex, is the address from which Mr. A. Winters writes: "In your November feature there was a reference by two people to the new aquarium foods. I was introduced to aquarium foods by a member of our Ilford Aquarist Club. I have two 42-in. tanks, one containing community tropicals—neons, tiger barb, a *Corydoras*, rosy barb, scissors-tails, black mollies, blind cave fish, one zebra and a sucking loach; the other four large goldfish. Two are 6 in. in length. The goldfish were three ordinary pence each and 1 in. long when I bought them three years ago. I have just never seen anything like it since feeding my stock on aquarium flakes. They come to the surface and stand on end with their mouths open; and I just drop some flakes into their mouths. In the tropical tank I crumble the flakes and it is like a turmoil when I scatter them on the water surface. They all eat the crushed flakes. Now it is almost impossible to walk near the tanks because all the fishes go quite mad. Even now, while I am writing this, the goldfish are watching me; and if I move near them they will stand on end waiting for the flakes. I have to keep them strictly to three meals a day; the temptation is to give them too much. Up until now I have fed them on a well-known tropical and coldwater brand, but I have never had this experience with the food. I will say that the tanks are clean because the tropicals rummage around and the goldfish dig in the stones until every piece is eaten."

Mrs. L. Englefield writes from 45 Colina Close, Coventry CV3 3EG. She states: "I would like to take up your point about tank weight. When we started keeping fish our first tank was an all-glass 66 in. x 15 in. x 15 in. and everyone we knew shook their heads over the weight as we live in a flat. The tank contains over 1 cwt. of gravel and, including this in the calculations, we found that per square foot floor area the tank weighed around 9 stones—less than an average person standing up.

"Finally, my comments on True-Lite—the only

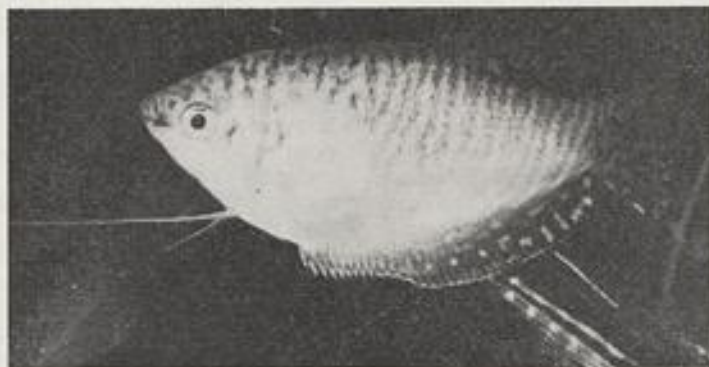
improvement noticed since employing a 5-ft. True-Lite is in plant growth. Although we had a good growth before, under a warm-white tube, new plants shed their existing leaves when bought and took a short while to grow new ones. Under True-Lite the plants have not lost any existing leaves when we have bought them. I didn't believe in the magical healing properties of True-Lite anyway, which is just as well since we have had four Congo salmon die of no apparent cause—except general ill health—and have, at the moment, a particularly nasty outbreak of white spot."

Mr. D. Sloss lives at 183 Castlefern Road, Rutherglen, Glasgow G73 4AR. He writes: "Regarding your comments on the respective quality of British and Continental goods, I would argue that the reason why we buy so many imported products is merely that we have, in many cases, no alternative. Regarding dealers: there is a practice that deserves our unanimous condemnation—the importation of cheap goods, usually from the Far East, by dealers who, having no scruples unload this rubbish on the market to be bought by the uninitiated would-be aquarists. The retailers who stock such goods are equally at fault. May I now relate my experiences of two products, from reputable firms, which failed to live up to expectation. My first concerns the Interpet Air-stream Super Twin filter, and my experience conflicts with your own stated opinion. This filter is, as you say, an efficient one, and I would recommend it to anyone who can afford to maintain it in working order. To do so one requires to buy replacement siphon sets every few months as they wear out very quickly. I put up with this for two years and then it occurred to me that present-day technology was sufficiently advanced to enable a simple tube to be manufactured from a plastic material resistant to immersion in water. Having decided that buying British was a sentiment that my purse would not allow me to endorse, I bought a large Hykro outside filter, and two years later it remains in perfect condition with no perceptible wear having occurred in the siphons.

"My second experience concerned an Esha 202SR pump, I bought about six months ago, that was defective when purchased. I was rather dilatory

about taking action to have the pump repaired, but when I did eventually write to John Allen Ltd., the distributors, for advice, they did not have the common courtesy even to acknowledge my letter. However, last week I wrote to Jurgen Schwarzer, the manufacturer, with more positive results, for today I received from them a new diaphragm and valve block, and having fitted same I now have a higher air output than I require, and consider this pump to be an attractive and worthwhile buy. May I conclude by thanking you for the pleasure and information gained from your articles. "Lang may your lum reek," as we say in Scotland." (I would like to remind readers that I accept no responsibility for the views and opinions expressed by contributors to this feature; and that I do not necessarily agree with the opinions expressed. Having made those points I would like to make a couple of observations on some of the products mentioned by Mr. Sloss. I know that several years ago a few firms had a little trouble with some of the plastic

the reason why spare parts are available. A similar situation exists with the majority of mechanical items—as owners of cars, TV sets, hi-fi, washing machines, etc. know. I would suggest that anyone who purchases an item which fails to operate satisfactorily should return it to the shop where it was purchased and ask for it to be repaired or replaced. One has the law on one's side if the item is faulty. On the few occasions when I have written to manufacturers or distributors to complain about defective items I have always received courteous replies and, where appropriate, free replacement parts. I'm sure that if Mr. Sloss obtains a new set of tubes for his Airstream he'll be pleased with the performance of his filter. Speaking of problems with plastics used to make filter tubes, I was interested to note that the Nuova Turbinette power filter, jointly distributed by Fantasy Pet Products and Hillside Aquatics, uses best quality plastic; in fact it is the same as is used by the medical profession for giving blood transfusions. My review of the Nuova



tubing used in their filters. I bought one of the early Interpet filters and its tubes bent out of shape; however, a letter to Dr. N. Carrington, of Interpet, quickly brought a set of free replacement tubes made from a new type of plastic. At a later date I visited the Interpet factory, at Dorking, and saw the filter tubes being shaped. I understand that Interpet solved the plastic tubing problem several years ago.

The replacement tubes I received for my original filter, and those supplied with more recent Airstream filters I have purchased, have never given me any bother whatsoever. Some years ago I purchased two large, outside Hykro filters for the aquaria in the school in which I taught. After being in use for some time the filter tubes appeared to dissolve in the aquarium water. Again, a letter to the distributors brought free replacements for the Hykro filters and the replacements gave no trouble at all. The tubes in an outside Hykro filter that I bought just over a year ago have given no bother at all. Obviously no pumps or filters last for ever and that is

Turbinette power filter should appear in the near future).

Mr. M. Brennan's home is at 4 Vale Road, Oatlands Park, Weybridge, Surrey, and he joins the growing ranks of those singing the praises of Aquarian foods. He writes: "I would like to express my thanks to the people who make Aquarian for making a great fish food. At my local pet shop I bought Aquarian Tropical Fish Flakes and Growth Food; both were cheap and the design of the metal containers is a good idea because when the tub is nearly empty one doesn't have to jam one's fingers down into a narrow tub, as one has to do with many fish food containers. Also, the flakes are large and not brittle, so they don't break into really fine dust. I am now looking forward to the Aquarian remedies being sold because if their quality matches that of the foods they must be good.

"Another food I am pleased with is white worms. I was given a culture by a Mr. Cook, who halved one of his own cultures. The worms are coming along well and will soon be ready to be fed to my fishes. Another



food linked with white worms is *Tubifex*. I have heard a lot of people saying they dislike *Tubifex*; but personally I think they are a fine food as long as they are not fed in large quantities. In the October issue you mentioned your dog's interest in your fishes. Well, I have a cat which is for ever jumping up on my tank lids and going to sleep on them—usually just above the lights. The covers are not very strong—especially with a fat cat stuck on top! Also, my covers are not a tight fit: there is about a 1-in. gap at the front and my cat tried his paw at fishing. He didn't actually catch anything but swished his paw around in the water."

It's just about five years since Mrs. D. I. Hutchinson last wrote to me from her then address in Northumberland; at that time she had six tropical and one cold-water tank—plus various containers for raising fry. Mrs. Hutchinson now lives at 16 Upper Kinneddar, Saline, Dunfermline KY12 9TR. (The Scots have certainly been contributing their share of opinions to this feature of late—and I'm delighted to hear from them. I'd be pleased to receive more letters from Irish and Welsh readers to hear how the hobby is progressing in their parts of the British Isles). Mrs. Hutchinson says: ". . . I came to this house with just two old pals (fantail goldfish). Now I have four tanks; the old pals got really pally and spawned. I saved some eggs and raised the youngsters; I now have five 2½-year-olds in with their parents. In the other tanks I keep the hardier types of tropicals—zebras, Australian rainbows, tiger barbs and one red-finned shark; and white cloud mountain minnows, cherry, rosy and Schuberti barbs. The latter collection has been set up for nearly three years, the zebras, etc., since last April, deliberately kept without immersion heaters or pumps or filters just to prove it can be done. I was experimenting with keeping tropicals without heaters in my previous home and was successful with guppies, mollies, platies and swordtails, which lived well and produced young all as normal. I had no problems with *Ich*. The main reasons for doing without heaters were: tales of thermostats sticking and fishes being boiled to death; the cost of running six or more heaters, plus pumps for filters; the worry of power cuts and failures; and the unsightliness of equipment in the tanks and the multiplicity of wires and switches necessary. I will admit that it is probably necessary to have a heated house to succeed with any but the zebras, white clouds and *Odaka* types—and, possibly, guppies. Overnight temperature here never drops below 60°F. Tank lamps are switched on at about 3 p.m. and are switched off around 11 p.m.; by which time tank temperatures have crept up to 68-70°F. Fishes are as lively as I've seen them in heated tanks, and my only worry these days (October) is the possibility of power failure. Rates of growth are somewhat slower; fishes usually need a year to reach full size—

but this summer made a difference! Those purchased in April are nearly fully grown.

"Plants are more of a problem, and this is where much more experimentation comes in: trying all the usual ones I used to grow in heated tanks; tracking down others said to be tolerant, of temperatures and conditions; not believing it when some fail, and trying them again. Most successful, obviously, are *Elodea*, *Vallisneria*, *Sagittaria* and hornwort, though the penultimate ones are very slow. *Bacopa* species, said to do well in cold water, do not thrive in my tanks; perhaps they don't like the fairly soft Fife water supply. *Cryptocoryne* and *Aponogeton* species do well; they indulge in dormant periods and then surprise me with flashy fast growth to make up for lost time. The main thing is, they don't die. Indian fern does fairly well if I float plantlets on the water surface until they become large, and then plant them in the gravel. Then they spend a few months disintegrating and releasing plantlets, which I float on the surface until . . . and so on. I've always got some. *Ludwigia* and *Hygrophila* do well and need occasional pruning. Java fern is on trial at the moment; two specimens in separate tanks have each produced a couple of new leaves since arrival, so I have hopes of this species. *Fontinalis* does so well that it gets to be an embarrassment. Amazon swords promptly dropped their leaves; but I've left their roots to see if they will adapt or not . . ." (There's food for thought here!)

In the November, 1975 edition, in "Our Readers Write," there appeared a letter written by Mr. George F. Hervey and Mr. Jack Hems. The letter appeared under the heading "Clarification Requested." In their letter Mr. Hervey and Mr. Hems, who are recognised by informed aquarists as being Britain's leading authorities and authors on the subject of freshwater fishes and aquaria, and whose books are standard reference works on these subjects, expressed concern about some comments which Mr. I. G. Bave contributed to this feature and which appeared in the September, 1975 edition. Mr. Hervey and Mr. Hems stated that ". . . a number of people . . ." drew incorrect conclusions from the comments made by Mr. Bave. Regular readers of the *Aquarist*, of this feature, and of my occasional book reviews will already know of my high regard for the books written by Messrs. Hervey and Hems; and indeed only last month, in an article I wrote for *Education*, the journal of the Association of Education Committees, I recommended Messrs. Hervey and Hems' book, *A Guide to Freshwater Aquarium Fishes*, for use by both teachers and pupils in U.K. schools. Theirs was the only book I recommended by name (see *Education*, Vol. 146, No. 17, dated 24th October, 1975). Obviously, when I included Mr. Bave's letter in the September, 1975 *W.Y.O.*?, the thought never entered my head that

anyone would be so ill-informed as to consider that Mr. Babe's reference was to the excellent works of Messrs. Hervey and Hems—works the content of which is matched only by the fine style and use of the English language. I am pleased to be able to publish the following letter, from Mr. Bave, for the benefit of the ". . . number of people. . ."—and I feel sure that the number of people must be very small. Mr. Bave, who resides at 87 Aspen Gardens, Hammer-smith, London W.6, writes:

"No doubt you have read the letter sent in by Mr. Hems and Mr. Hervey, and I expect (that you were) just as surprised as I was. When I wrote to you, their names were far from my thoughts, as no doubt they were from yours otherwise I feel certain you would have censored that particular paragraph. Taking into consideration that there must have been dozens of

the hobby would imagine for one moment that my quotation was aimed at them; and I am equally certain it would not prevent the sale of their books, a statement I thought was a little far-fetched. As a matter of fact I have one of their books, purchased around 1965/66, entitled *Freshwater Tropical Aquarium Fishes*, published by Spring Books, London, which I have used exclusively for the classification and identification of the various species of fish.

"There is one rather disturbing factor that arises from all this and that is, writers to *W.Y.O.* must take care that they phrase their letters in such a manner so as not to cause offence and risk hurting people's feelings, although not intending to do so. No doubt we all hope that this will not deter readers from contributing to the valuable columns of *W.Y.O.*? In conclusion, and in a lighter vein, I must refer to



books published by various authors over the years, I fail to understand why these two gentlemen should think that I was referring to them. I met the gentleman (?) in question shortly before he was due for retirement; his chief hobby, he told me, was the keeping and breeding (of) tropical fish, which he started before the war years. I suggested to him that during his retirement he should write a book on the subject; he said something about giving it a try, passing the remark that has caused this misunderstanding. As far as I can remember no actual names were mentioned and I did not pursue the matter further; and although we met several times afterwards there was no further mention of this. It was he, incidentally, who was instrumental in my starting the hobby, and who introduced me to the *Aquarist*.

"Taking into account that both Mr. Hems and Mr. Hervey are considered to be leading authorities on tropical fish, and that their integrity is beyond reproach, I cannot accept that anyone connected with

Mr. M. Delaney's letter in the April *W.Y.O.*? on his criticism of "*From a Naturalist's Notebook*." Although I did not agree with his sentiments I had a good laugh at the way he put it; and I am willing to beat that Eric Hardy did too."

15-year-old Peter Barker's letter is headed 66 Hall Lane, Hindley, Wigan, Lancs. Peter's first letter appeared in a recent edition; and its publication caused him to write the following: "I would like to say that having seen my letter in your feature, I make it look as if I deliberately experiment to find out what fish convicts do and do not kill. This is not the case; and the convicts have since been separated and are now rearing their third batch of young—which have just become free swimming. I am very proud of my convicts and did not intend to make them out to be merciless executioners. The whole process took some months. Although expensive, Tetra foods are always greedily accepted by my fish. A wide variety of Tetra foods is available, and each one of

them I had always considered to be the best of that particular kind of food—until I discovered Aquarian, that is. Aquarian foods are also available in many different varieties for different fish. They are fresh, greedily eaten, and, to cap it all, are very inexpensive—an excellent development in fish foods.

"Regarding the humane killing of fish: in many cases there is no need to put a fish 'out of its misery' at all. Half a bottle of methylene blue works wonders in a diseased tank, and does not harm even the most delicate plants. To save valuable fish, chloromycetin and streptomycin, although difficult to obtain, are very helpful." (Readers should beware of adding "half a bottle" of any type of "cure" to an aquarium. The instructions supplied with all remedies and treatments should be followed most carefully to avoid possible disasters. Some years ago I experimented with chloromycetin in an attempt to cure an unknown disease that was killing off my fishes and that had failed to respond to the then available standard "cures." The chloromycetin did effect a cure and I published my findings in an article. I obtained the drug from my local vet—who was willing to supply it when he knew for what I intended to use it. He admitted to knowing but a little about diseases of pet fishes. Have any readers ever taken ailing fishes to a vet? If so, did the vet in question know much about ailing fishes? Perhaps younger vets receive training in the treatment of fish diseases? As tropical fishes are now the most popular pets in the U.K. I feel that all vets should know something about treating their ailments—although it would probably be cheaper now to replace ailing fishes rather than pay a vet to treat them. Modern treatments can certainly cure a wide variety of sick fishes; but deformed fishes cannot be cured and often have to be destroyed—as do rogue fishes for which one cannot find a suitable home. Surely some reader must know of a chemical or drug which would painlessly kill a fish. None of the methods suggested to me so far appeal to me. On the rare occasions when I may have to dispose of an ailing or deformed fish I shall continue to flush it down the lavatory—even if the method offends some readers, and isn't too popular with the fish concerned. I'll change to a more humane method if someone suggests a suitable drug for the purpose.

I was pleased to receive the autumn 1975 edition of the Federation of British Aquatic Societies' Bulletin. As usual, it contains a wide selection of news and views. I was particularly interested to read an article entitled "Trade News." It gave details of the few "new lines" on show at this year's Pet Product Marketing Exhibition. I was sorry to learn that the Aquatic Development Group had folded up as it seemed a good idea. In the Bulletin's Editorial, by Mr. R. C. Mills (a gentleman who has frequently contributed to *W.Y.O.*?), mention was made of the rising cost of electricity and of heating and lighting aquaria. I'd be pleased to have readers' opinions on how aquarists could attempt to cut down on heating and lighting costs. (By the way, do other readers share my frequent confusion over the abbreviations used by the ever-increasing number of specialist groups? Most of us can translate F.B.A.S. into words; but can you manage the B.K.-K.S. or the C.A.G.B.—to mention but a few? Obviously, the members of the British Koi-Keepers' Society and of the Catfish Association of Great Britain are able to do so. I feel that it might be of benefit to specialist societies and groups if they printed their titles in full in the general aquatic press. As a matter of interest, a current N. Ireland car registration prefix is KOI—followed by one to four numbers. No doubt it would appeal to those who keep Koi).

For a future edition please send me your opinions on the following. (a) Photograph 1 shows a golden gourami (photograph by courtesy of High Street Aquatics, Larne). Please send me details of your experiences with the breeding of this fish. (b) What plants would you recommend for growing around a garden pond? (c) Photograph 2 is of a couple of Amazon sword plants. Please send me details of your experiences with the less common species. (d) Which colour and which monochrome film do you consider to be most useful for fish photography; and which is the best form of lighting by which to photograph a whole aquarium? (e) What is your favourite brand of U/G filter, and why? (f) Details please of your experiences with the clown loach. (g) What would you expect to pay, in your area, for a 24 in. x 12 in. x 12 in. all-glass tank—with or without plastic edging? I look forward to receiving your opinions.

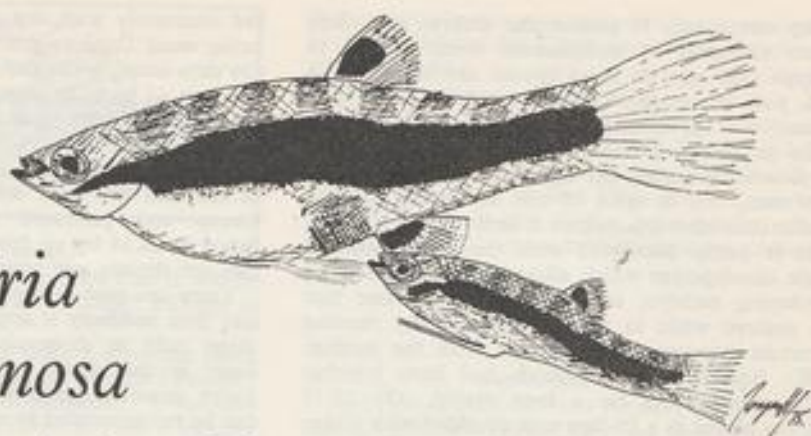
## B.K.K.S. NEWS

ON SUNDAY, 14th March, 1976, a Seminar for Koi Keepers will be held at the Post House, Leicester, starting at 12 o'clock. An extremely interesting programme has been planned with three specialist speakers invited to lecture on three major subjects

close to the heart of all koi keepers—fish diseases, fish diet and pond construction. Each lecture will be an hour in length with a similar time allotted after the lecture to discussion from the floor. Further details will be appearing in these columns before the Seminar takes place, but should further information be required please contact Roland Seal at 7 Highlands Road, Offerton, Stockport, Cheshire SK2 5HU or Valerie Frost, 75 Edward Street, Southborough, Kent.

# *Heterandria formosa*

by Jorgen & Pamela Hansen



ONE of the smallest livebearing toothcarp is *Heterandria formosa*, which originates from South Carolina, Georgia, and Florida. It is not very common but very much worth a close acquaintanceship as it neither requires much place nor demands special conditions with regard to water type, temperature, or feeding.

The fish belongs to the family *Poeciliidae* from the order *Cyprinodontiformes* (toothcarps). It was classified as early as 1853 by Agassiz and introduced to Europe in 1912. The female grows to a length of 3½ cm. while the male at 2 cm. is considerably smaller. For a long time the male was regarded as the smallest known vertebrate, but other fish of a similar size have since been discovered.

The body colouring is olive green, the belly being of a slightly lighter shade, which indicates that the fish is surface-inhabiting. A black or dark-brown stripe runs from the snout all the way along the body to the base of the tail. This stripe is 1 mm. broad in the male and 2 mm. broad in the female. In males the prominence of the stripe is variable. In both sexes are to be found 8-14 dark but barely visible transverse stripes. If you regard the male's head from above, you can make out a delicately portrayed dark brown pattern. Both sexes have a dark spot anterior in the dorsal fin; the female has moreover a dark spot in the anal fin, while the male's anal fin is modified to form a gonopodium, or copulatory organ.

*H. formosa* keeps mostly to the surface of the aquarium amongst floating plants and leaves from those of the tank's other plants which reach so high up. The fish also spends some time at the bottom, seeking eatable items, so the tank should not be too

deep. The best tank will thus be one specially set up for the species; the fish should under no circumstances be placed in a community tank where it will be in great danger of being devoured and where, at any rate, no young will ever appear.

The tank should not be very large; 15-20 litres is adequate. It should be thickly planted, e.g. along the back and sides, leaving a certain amount of open space so that the spectator gets a chance to see the fish now and then. As these small toothcarp never dig or spoil the tank, one has a chance to use fine-leaved species of *Cabomba* or *Myriophyllum*. The temperature should be between 18 and 25°C (64-77°F) for the fish to feel comfortable.

If in the spring you place a pair of *H. formosa* in a specially arranged tank and in the course of the following six months feed the fish and thin out the plants, you will be amazed at the resultant number of fish. 50 fish of different sizes from fully grown to newborn fry would not be an unrealistic expectation.

The fish accept both dry and live food, but the male's small mouth should be taken into consideration and the largest particles or individuals sieved away. A supplement of vegetable food either in the form of algae or dry food is necessary.

The birth of the young *H. formosa*, as opposed to other livebearing species where the process is over in the course of a few hours, spread over several days. This is related to the peculiar development of the eggs which develop singly one after the other contrary to the more usual simultaneous development where all the eggs are at more or less the same developmental stage at any particular moment. Broods of up to 25 fry are produced.

With primitive live-bearers the mother's abdominal

cavity serves only to protect the embryo and there is no transport of nourishment from mother to embryo: the eggs in these species are large with a high yolk percentage. In the guppy (*Lobistes reticulatus*) the egg measures 2.0-2.1 mm. in diameter while in *Mollinisia* it measures 1.9-2.1 mm. In *H. formosa*, however, the egg diameter is only 0.37-0.40 mm., but in spite of this the young are not smaller than other live-bearers at birth, namely 5-6 mm. This is partly connected with the aforementioned single development which allows more space for the developing embryo, and partly with the fact that the embryo while in the abdominal cavity receives a certain amount of nourishment from the mother.

We isolated a female which had been together with several males for a long period. On 27-12 she was placed in a 15-litre tank provided with plenty of hornwort, *Geratophyllum demersum*. She was

fed alternately with dry and living food, the latter being small *Daphnia* and *Cyclops*. On 1st February (36 days later), we espied the first baby fish. It was 5-6 mm. ( $\frac{1}{4}$  inch) in length and otherwise resembled the adult fish with regard to general body colouring and the black longitudinal stripe. By the next day six further young had been born. In the course of the next few days the female regularly appeared plump and produced fry. On 19th February, fished in all 14 fry up from the tank, after the female had not thrown any young for a week.

Years can pass without *H. formosa* being available and then suddenly it appears in all aquarist dealers' shops only to disappear again. One should thus jump at the chance of acquisition, if interested. Every aquarist interested in livebearing toothcarps can be recommended to set up a tank for *Heterandria formosa*.

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## A LESSER BLADDERWORT

by B. Fry

THE genus *Utricularia*, of the botanical family *Lentibulariaceae*, contains plants that are cosmopolitan in range and varied in size and choice of environment. Some 30 species are truly aquatic. About 120 more are indigenous to bogs. Some are known to be epiphytic.

By and large bladderworts have no roots at all but a small minority do have root-like processes. All, however, bear flowers of a sort and bladders, ovoid or globose, the chief function of which is to trap insects and smaller living organisms and to translate them into food. Hence bladderworts come under the popular heading of insectivorous plants.

Our native bladderwort is formally known as *U. vulgaris*. This plant, like our native water soldier (*Stratiotes aloides*), has the interesting habit of rising and sinking in the water according to the season of the year. Thus in summertime the plant is seen at the surface supported by air-filled bladders. Its yellow flowers are held aloft on inches-high stems. After flowering is over, the bladders become waterlogged and their weight pulls the plant beneath the surface.

The bladders of *U. major* have openings large enough to allow the entry of quite large prey such as water-fleas (*Daphnia*). The smaller-growing bladderworts feed on infusorians and other microscopic water life.

A most valuable and pretty bladderwort to introduce into a heated aquarium is *U. gibba* (= *U. exoleta*). This plant has bladders too small to endanger the lives of any fry. Indeed, it can play a useful part in saving

young livebearers from being eaten by parent or other fishes sharing their tank. This on account of its masses of tangled growth. To give a simple example. A few strands of the plant in a few months will become a thick tangle of countless threads the colour of the finest lawn grass. These threads, or stems, branch out in every direction. Spikey leaves miniscule in length appear at short intervals along the stems. Tiny bladders sprinkle the stems and leaves. The bladders have the appearance, at least at a quick glance, of miniature greeny glass beads.

This lesser bladderwort, like others of its genus, flourishes best in water low in mineral salts and giving, under pH test, an acid reaction. So an aquarium with a peat base under a non-calcareous grit or sharp sand or, alternatively, having a peat filter draining a slightly hard to neutral water would be an aid to satisfactory culture. But besides this desirable requirement a good light. The light, though, must not be so bright as to promote the cotton wool- or hair-like types of algae which, burgeoning amongst its stems, would soon put a brake on its expansion, and eventually kill it, in a smothering growth.

*U. gibba* may be anchored to the floor of a tank by pushing some of the stems under a stone or tying them to a stone. On the other hand, it may be left to grow floating. The plant occurs in the natural state in parts of southern Europe, wide areas of Africa, tropical Asia and, in all probability, the major part of Australia.



#### Killifish Names

I am writing this letter in the hope that it will be printed in your "Our Readers Write," column of *The Aquarist and Pondkeeper*.

First of all I would like to make a comment about Bill Simms' article "The Affle O' Semion Cousins," in the November issue of this magazine. I was very pleased to see the article on killies as I am a member of the B.K.A. and I would like to see a lot more of our aquarist friends keeping these very attractive fish. But I was disappointed to see at least two of the fish wrongly named. I know that identification of killies is sometimes difficult, but before anyone writes an article for a magazine I feel they should make sure their facts are right, to avoid confusing any would be killie keeper. To set the record straight I would add that the fish Bill has named as *Aphyosemion sjoestedi* is in fact *Rollofia occidentalis occidentalis*, and the fish named as *Aphyosemion coeruleum* is *Aphyosemion sjoestedi*. I hope Bill will continue to write articles on killies as he puts the subject over in an easy to understand way and this in itself is a good thing for the beginner to killie-keeping.

Secondly I would like to take this opportunity through the medium of your magazine to say goodbye to all our friends in the hobby, as Pat and I are emigrating to South Africa in January. We will miss you all very much, and would like to wish you all the best for next year's show season.

And last but not least, to all the show secretaries whose shows we competed at in 1975, all our perpetual trophies will be returned through members of our society Gosport A.S. Goodbye and good luck for the future.

TONY AND PAT NEWBURY,  
176 Bournemouth Road,  
Chandlersford, Hants.

I have read the letter from Tony and Pat Newbury with great interest, particularly as they are members of the B.K.A., which implies a great interest in and knowledge of killifishes, for this is to be applauded. I think, however, that they lay too much stress on recent changes in Latin nomenclature, which is going on in all branches of biology all the time. Possibly they are correct about the changes of name, but the Blue Gulari has been *A. coeruleum*, and the golden Pheasant Gulari, *A. sjoestedi*, for so many years now

that it does not encourage beginners to take an interest in these delightful fish if they are confused by changes of name, which, to them, appear to be a further hazard to learning the Latin names.

In addition, I would point out that the loose-leaf edition of *Exotic Tropical Fishes*, by Axelrod and five other authors, still gives these fish the Latin names I have used, as does Hans Frey's Dictionary. Possibly the fault lies in the poor quality of my drawings, which, without colour, may have misled the readers. I hope not.

BILL SIMMS.

#### Tapes and Slides

May I, through your "Our Readers Write" column answer Mrs Woodliffe's plea for programme aids ("Our Readers Write," November issue).

The Federation of British Aquatic Societies operates a Tape/Slide programme service which is available to all societies. 12 titles are available at present, with more in production or planning stages.

Brief details are as follows:—Tape speed—3½ inches per second, ¼ track mono, 5 in. spool. Slides—glass mounted, 35 mm. standard mounts. Programme length—between 45-65 minutes with "built-in" refreshment point.

Cost:—For F.B.A.S. affiliated societies—£2.50 per programme.

For non-affiliated societies—£3.50 per programme.

For overseas societies—rates upon application and may vary according to air mail postal charge involved.

Programme notes and instructions with every programme. Full details of titles available may be obtained from R. C. Mills, at address below.

R. C. MILLS,  
70 Lee Road,  
Perivale,  
Middlesex UB6 7DB.

#### Fish and Chips

This is a true story which occurred at Belle Vue's British Aquarists' Festival, earlier this month.

My wife, myself and our two young daughters had been at the festival about two hours, and the children were beginning to get bored, so my wife suggested that we take the children to see the animals.

At the time I was carrying a sandwich box, and a carrier bag, containing various purchases including two bags of fish.

During our journey around the zoo, we called at the Elephant house. Inside were two elephants, one of which was doing a dance for the public and obviously

trying to attract tit-bits from us. My wife suggested I should give it a biscuit from the sandwich box, so I put the carrier bag against the railings in front of the enclosure, whilst I opened the sandwich box. In a flash Muki, the larger elephant had its trunk through the railings and into my carrier bag. Before I could stop it, it had grabbed a bag of fish and pulled them into the enclosure. Naturally I was alarmed for the safety of the fish, in case the elephant dropped the bag, but my alarm turned to stunned disbelief, when it proceeded to ram the bag straight into its mouth. There was a muffled bang as my bag burst after which it just swallowed the lot. Up to that moment I had never heard of any elephant having an appetite for young Snakeheads!!!

P. J. NORTHEROP,  
50 Maple Street,  
Queens Road,  
Hull,  
Yorkshire.

### AGS

THE GOLDFISH HOBBY is pleased to announce that, on Sunday the 2nd of November 1975, Association of Midland Goldfish Keepers; Bristol Aquarist Society; Goldfish Society of Great Britain; Midland Aquarium and Pool Society and the Northern Goldfish and Pondkeepers Society sent representatives to the Foleshill Community Centre, Coventry where they witnessed the birth of a newcomer. The representatives had been instructed that they should make every effort to ensure an easy birth.

Due to the enthusiasm and co-operative spirit displayed, as the task was undertaken, the operation proved most enjoyable and the body emerged without encountering any undue difficulty or problem. It is only fitting that those who collaborated in this achievement should have their names recorded—they are:—

A.M.G.K.	F. W. Orme; N. R. Giles; D. J. Hancox.
B.A.S.	H. C. B. Thomas; W. C. Ham; S. Lloyd.
G.S.G.B.	N. A. Dodkins; H. G. Berger; W. Leach; A. C. Law.
M.A.P.S.	F. R. Close; T. L. Dodge; A. E. Roberts.
N.G.P.K.S.	W. H. Ramsden and B. M. Rothwell.

The strong possibility that the Goldfish Hobby was about to produce a most welcome addition became very obvious some months ago. The specialist groups met at Coventry, on the 20th of April 1975 and examined the case before giving their opinion that the event was not far away. A further examination was held at Bristol on the 13th of September, when the date for this greatly anticipated happening was given as November 2nd. The birth commenced at

11.00 a.m. and by 3.00 p.m. of that Sunday the body had emerged without any complications.

After some thought, and discussion, it was agreed that this worthy offspring of the Hobby should be given the title of "Associated Goldfish Societies" (A.G.S. for short) and to appoint guardians for the next twelve months. Mr. F. R. Close, (M.A.P.S.) to act as Secretary/Treasurer and Mr. F. W. Orme as Public Relations Officer. Both appointees thanked their colleagues for the trust placed in them and gave an assurance that they would take good care of AGS, doing everything possible to ensure that it made sturdy growth. A resolution was made that the representatives would meet every three months, at Coventry, to check on AGS growth. The opportunity would be taken at these meetings to discuss the further progress of AGS and look after its interests. (The steady growth of Associated Goldfish Societies has great potential for the good of the whole goldfish hobby).

In order that AGS should be directed along the right path—and to prevent it becoming an overbearing and domineering influence as it grows—the following "Guidelines" were laid down:—

1. To promote good fellowship and understanding by furthering the well-being of the Fancy Goldfish Hobby in all aspects and matters. No decision shall deprive any group of its individuality or freedom to manage its own affairs.
2. Membership shall be open to any Association, Society, Body or Group, but must be approved by the member groups.
3. Delegates must be *bona fide* goldfish keepers.
4. The Chairman shall be elected in rotation, by the delegates, for each meeting. The Secretary and P.R.O. shall not be eligible to act as Chairman during their term of office.
5. Each member group shall contribute an equal annual affiliation fee. The sum shall be revisable and must be approved by the member groups.
6. All decisions must be approved by all delegates. Important matters must be put before the membership of member groups who will instruct their delegates how to vote.
7. The minutes of each meeting shall be made available to the member groups by their delegate.
8. In the event of the "voting delegate" being absent from a meeting another may be nominated in his stead—each group sending up to four delegates to a meeting of which only one shall be entitled to vote.

AGS is a gregarious "baby" and will welcome all groups of goldfish enthusiasts, no matter how small. It has realised the benefits that can come from tolerance,

goodwill, co-operation and unity together with the ability to see the others' point of view. Were it not for these principles AGS would either not have been conceived or would have been still-born!

If AGS is to develop fully—and reach its majority, it will require the care and attention of the whole goldfish hobby. Will goldfish enthusiasts band together and join the creators of AGS? Together we can raise a strong body to represent, and protect, the hobby's interests. AGS will not bar, without good reasons, goldfish keepers who belong to societies that are mainly interested in tropical fish—but it will insist that only goldfish keepers are allowed to participate in the efforts it will make to further the goldfish hobby.

Yes—the goldfish hobby is very pleased to announce the birth of AGS. If you, the reader, are an enthusiast of the goldfish, and would like to help in the growth and progress of Associated Goldfish Societies, why not write to either Mr. F. R. Close, 154 South Road, Handsworth, Birmingham, or Mr. F. W. Orme, 94 Newman Way, Rubery, Birmingham. AGS would be very pleased to welcome you into its circle of friends and supporters.

#### Frances and her fishes

This is little Frances Fullwood writing to you from Boston, Lincolnshire. I wish to inform you that your magazine, the *Aquarist* is most helpful to read and I take it each month. As I am only twelve years old, it helps me to learn about different fish and how to keep them.

First, I would like to inform you a little about myself. I am a little girl with two holes in the heart. Four and a half years ago I had an operation at the Heart Hospital, Croby Road, Leicester. I am sorry to say that it was not a success. The heart specialist surgeon informed my Mum that I require an operation which takes six to eight hours. This is impossible, they say, as I am so weak I would not survive that kind of surgery. They also informed my Mum I would be in a wheelchair for life. I cannot play like other children so I have two hobbies to keep my time occupied; that is tropical fish and collecting postage stamps. I have thirty-two volumes of stamps from all parts of the world. Most of the British embassies and Consuls all over the world know of me. Two of my dear friends are Her Majesty the Queen and his Holiness Pope Paul of the Vatican, and newspapers from most countries have written about me and the people of the commonwealth countries and islands and foreign countries all send me stamps.

The reason I have written is that I wish you to know that the Lord Mayor and the people of Melbourne in Australia learned of my interest in tropical fish and the happiness they give me so last Christmas they collected for me to have a large tropical fish tank. They sent the money and asked me to go to a tank

maker or two where they sold tanks, so I went to the Riversdale Fish Farm, Frisby Road, Halton Holgate, Spilsby, Lincolnshire. They purchased the tank for me. It's 72 in. long, 15 in. wide and 18 in. deep. It has three Springfield 250 watt heaters, three under-gravel air pipes and one stone sprinkler. The air pump is a Rena 301 pump. It has fluorescent five-foot tube lighting. I am most pleased with Mr. Kay's help with the tank and his kindness to fix it up for me. Mr. Kay is an expert at setting up a fish tank. I would say he is a leader in this field. He has made a most beautiful job of my tank. I am most proud of it. In the tank the rocks are made into pathways and there are caves and gardens made up with seven different coloured stones and the plants are set most beautifully to blend with the tank. I have Mr. Kay to thank for coming all the way to my home and giving all his effort to make my tank most beautiful for me.

In my tank I have a school of Cardinal Tetras and Neon Tetras. Also I have Bloodfins, Beacon fish, Glowlight Tetras, Serpaeas, Bleeding Heart Tetra, Lemon Tetras, Hatchetfish, Cherry Barbs, Golden Barbs, Harlequin fish, Zebra Danio, Pearl Danios, Spotted Danios, White Cloud, Coolie Loach, Upside-down Catfish, five Angelicus Catfish, Bronze Corydoras, Lyretail Molly, Red Platy, Variatus Platy, Sunset Platy, Celebes Rainbow fish, Siamese Fighting Fish and a baby Golden Severum. I call him Sammy. He comes to the top of the tank and eats out of my hand. He is a most beautiful fish and I love him dearly. My tank is so full up with fish I am saving up my pocket money to buy another 72 in. long 15 in. wide and 18 in. deep. The stand I have is for two tanks. I shall put it under my other tank.

If some of your readers have fish books they require no longer I would be most pleased with them so I can study and learn all about the fish.

LITTLE FRANCES FULLWOOD,  
(Aged 12).  
11 Brewster Road,  
Boston, Lincolnshire  
PE21 0DY.

#### English or Italian

I am a fond reader and direct subscriber of the *Aquarist*, and I wonder if you can publish the following in "Our Readers" column.

I would like to correspond, in Italian or English language, with someone (about 30 years' old), interested in aquariums so that when I come to England in 1976 we can get together for an exchange of ideas.

I thank you very much.

BIAGIO FONTANA,  
Via Mariano D'Amelio 3,  
90143, Palermo, Italy.



# PRODUCT REVIEW

## Gussie Food Flakes.

Two different flake configurations which comprise a 46% protein tropical fish food and a 20% protein coldwater diet. Both foods contain various natural ingredients such as fish liver, meat, roe, insect eggs and so on. The flakes are of sensible size and are not of too hard a texture. A range of quantities is available, culminating in a useful 10 oz. size which should appeal to those aquarists with several aquaria and for whom such an amount should prove economical. To retain freshness this last is packed in a strong plastic container which has a resealable top. Smaller quantities come in cardboard tubs with plastic caps.

All of my fishes ate the test samples avidly. The flakes are an attractive way of feeding because they both float and sink slowly so that fishes at all levels in the aquarium are reached. The makers state that their use will not cloud the water. My pond fishes seemed to find the coldwater flakes a welcome change from their usual peller food, and the flakes were mostly large enough to float for some little time.

At time of writing the quantities available and the prices, including VAT, are as follows:—

	Tropical Flake	Coldwater Flake
Standard	14p	13p
Large	19p	18p
Economy	33p	—
10 oz.	£1.65	£1.55

Distributed by Armitages Pet Products, Armitage House, Colwick, Nottingham, NG4 2BA. Telephone 0602-241031.

A. JENNO

## The Es-Es Flexible Heater.

An old friend which has not been readily available for some years. In the past many aquarists found advantages in under-gravel heaters. They are, of course, almost invisible in use and so are suited to decorative aquaria, but it was also claimed that the generation of heat in the gravel bed aided plant growth by stimulating the roots. This heater was also extensively used in fry tanks to overcome the problem of the young fishes burning themselves on the more conventional patterns. It should be welcomed back for this last use in particular.

The heater has been redesigned, the main difference being that the outer casing is now made of Silicone Rubber sleeving, which is a tough, durable material. It is very flexible and is impervious to both fresh and salt water. The immersible section consists of a loop of sleeving sixty-two inches long, containing the flexible element and its terminations. It is intended that this major part be kept immersed so a red band is fitted to indicate the waterline limit, and above this

point the heater is more rigid so that it can be bent to fit nicely over the top edge of the aquarium. Total length laid double is about forty-two inches. The power of the element is 100 watts and it can be obtained either for 240 volt or 110 volt mains supply operation. Life expectancy should be very good because the length of the heating element will result in an unusually low working temperature. The unit comes complete with a five-amp, two-pin plug-and-socket set already fitted.

In addition to the uses mentioned above other applications suggest themselves. In natural system marine invertebrate aquaria the problem of anemones or other slow moving creatures settling on an exposed heater, with disastrous results, could be avoided. Liquid live food cultures requiring a low surface-temperature heater to avoid burning of the cultured animals, for instance Micro-eels or Brine Shrimp, would benefit. Aquaria in cold rooms, where the gravel temperature would otherwise be far lower than the water temperature, are another instance. It should also be noted that in biological filter beds where water flow rates are high the conduction of the heat into the aquarium generally should be very efficient.

There are instances where this kind of heater is not suitable. Triggerfishes, large crabs, mantis shrimps and other creatures likely to damage the outer casing must not be given the opportunity to do so. Digging fishes such as the Cichlids would continually disturb the heater. Very large rocks or those with sharp edges underneath may cause damage. The makers state that the construction will take the weight of up to four inches of gravel, but must not be installed anywhere within an inch of the aquarium glasses.

The heater is a useful accessory for those cases where its advantages can be employed. It is coloured green for camouflage and will work with any aquarium thermostat. The test unit worked well and gave no trouble. I like particularly the inclusion of the two-pin connector as standard (which practice is I believe common to other Es-Es products). The correct use of this should avoid a potentially dangerous electrical joint made with tape or an exposed connector block between the heater and thermostat. In the light of the new Government electrical regulations I wonder if the provision of proper terminations might not become mandatory on all such equipment in the future.

Price, at time of writing,—£1.80 plus 25% VAT.

Distributed by Singleton Bros., (Electronics) Ltd., Truro Hill, Penryn, Cornwall. Telephone Penryn 2277.

A. JENNO

## TRUE-LITE FLUORESCENT TUBES

The subject of aquarium lighting has been, and probably always will be, controversial. All of our aquarium plants and many marine invertebrates use sunlight as a major energy source in their natural habitats, and many other creatures including most fishes may utilise sunlight as a direct minor energy source by absorption through their body surfaces. Sunlight is at the start of all food chains and so every living thing is in some way affected by its properties.

Artificial lighting used with aquaria then should have as nearly as possible the same effects as sunlight and also should preferably show the inhabitants to the human eye in their natural colours if a true simulation of the wild state is to be achieved. In "Viewpoint," in the May 1975 issue, I discussed the various kinds of artificial lamps at some length and tried to show the advantages and disadvantages of the commonly-used kinds, and to comment on their application to aquaria and their colour response to the human eye. In the same issue (by co-incidence) an article by Mr. J. D. Adams entitled "New Lighting Systems for Aquariums" introduced us to the new True-Lite tubes.

True-Lite is a trade name of Duro-Test International and the lamps are the subject of an American patent. They are of the same mechanical construction as other fluorescent tubes with regard to fitting, and so can be substituted in any lighting unit of the appropriate length for existing tubes. The light emitted is by design as near as possible a true representation of natural sunlight in terms of spectral distribution and the relative intensities of the component wavelength bands. Figure 1 shows the spectral power characteristics of natural sunlight as set out by the International Commission on Illumination, and figure 2 shows the characteristics of True-Lite. It can be seen that they are not very different, and examination of other lamp characteristics will show that this is the nearest approach so far. The

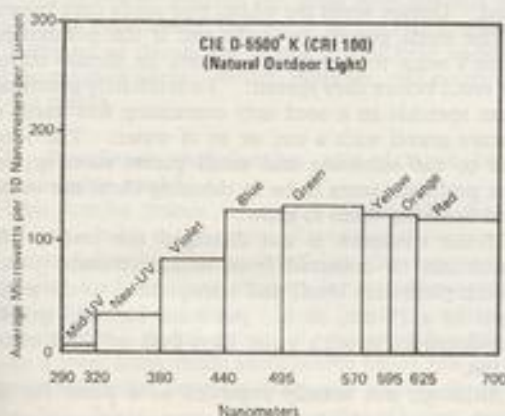


Fig. 1

January, 1976

question of the intensity which needs to be applied to any particular aquarium will of course still be subject to experimentation, as happens with all kinds of lamps, but the spectral range, i.e. the mixture of light colours and their proportions relative to each other have now been "assembled" for us so that True-Lite systems may prove to be a major step forward. It may very well be that in the future aquarists will look back upon this introduction with the same appreciation as is nowadays accorded to the introduction of the biological filter. We may be on the point of a major breakthrough in aquarium technology.

Two tests were carried out in my fish-house. For the first, a thirty by fifteen inch tank, eighteen inches deep, was set up with a mixed collection of common freshwater tropical plants set in about three inches of previously-used unwashed gravel. A few small fishes were included and a round, inside-fitting box filter was used. A twenty-four inch True-Lite tube was fitted into a simple aluminium trough reflector, which stood on the cover glasses, so that the lamp was about two inches above the water surface. The plants were not especially good specimens to start with, but all grew well and developed fully over the next few weeks. Bacopa, Amazon Sword, Cardamine, Cabomba and Riccia were especially good.

In the second test about sixty small pieces of Wisteria were planted into the gravel bed of an existing biological filtration system which had an area of thirty-six by fifteen inches. The aquarium was again eighteen inches deep, and the same lamp was used as before. The under-gravel filters were turned down to run at a very slow rate. After a few weeks the Wisteria is now about two-thirds of the way to the surface and has formed large five-leafed heads and strong stems. The fishes included were about two hundred newly-born Swordtails and these are growing as well as others in my other growing-on tanks.

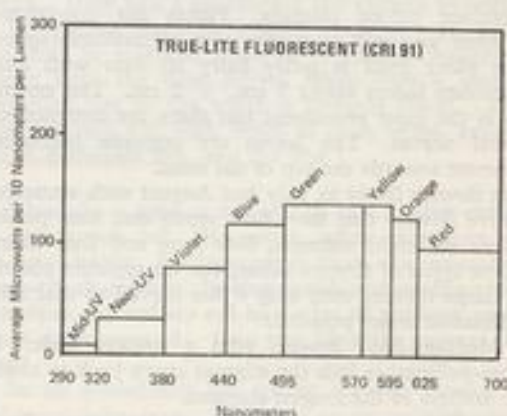


Fig. 2

In the above tests the lighting duration was for about fourteen hours daily. The fish-house is totally enclosed by insulation so no sunlight gets in. A five-foot Daylight fluorescent lamp lights the room generally, but would have had little influence on either of the tests as they were carried out as far away as possible. The point is that never before have I been able to grow plants so well in this fish-house under other kinds of artificial lighting, so in my case at least True-Lite is a significant improvement. I am about to set up a marine invertebrate aquarium so may be able to report on the effects of True-Lite on this later. I have seen True-Lite lamps in use over marine aquaria at various retail establishments and at Brighton Aquarium, and in each case felt it to be an improvement visually over the pink effect brought about by some other lamps. A simple comparison with sunlight can be made if the aquarist can look outside on a sunny day and then look at the aquarium. The eye retains a "memory" of the sunlight and will give a reasonable evaluation.

The tubes are advertised as being available in the following sizes:—15 watt (18 inches), 20 watt (24 inches), 30 watt (36 inches), 40 watt (48 inches), 65 watt (60 inches). In the 20 watt and 40 watt sizes a Power-Twist version is also available, in which the glass envelope has a spiral groove formed during manufacture and which is said to result in a ten-percent increase in light output without greater electrical consumption. The unit used in my tests was of this kind.

Price, at time of writing, is somewhat variable as there are no recommended retail values available. In the Midlands figures of £4.50, £5.00 and £5.50 (inc. V.A.T.) are being charged for the 20 watt, 30 watt, and 40 watt standard versions respectively.

Distributed to the trade by Emblem Engineering Ltd., Weybridge Trading Estate, Weybridge, Surrey. KT 15 2RH. Telephone Weybridge 48311. Leaflets available.

A. JENNO

## CODLINS and CREAM

by Phillip J. Brown

ALTHOUGH usually regarded as a weed, *Epilobium hirsutum*, otherwise known as the Great Willow Herb or Codlin's and Cream, can be attractive if planted in the right position. Its total height can exceed five feet so plant it amongst other tall plants around the pond in damp earth or in shallow water, a few inches deep. Because of its great capacity for reproduction by seeds and rootstock offshoots, combined with the deep run of its roots, it should be confined in a container before planting. Plants not constricted in some way will soon take over all available space. The plant itself is softly hairy all over with long lanceolate leaves about 7 cm. × 2 cm. The central rib is the most prominent but there are conspicuous lateral nerves. The leaves are opposite becoming alternate towards the top of the stem.

It flowers freely in July and August with attractive mauve flowers that have four sepals and four petals. There are eight stamens, four long and four short. Three types of flowers occur, but on separate plants:

1. Large flowers with long styles curved so that self-pollination is not possible.
2. Medium-sized flowers with a straight style. If cross-pollination fails the stigmas curve back to touch the anthers of the longest stamens.
3. Small flowers with the stigmas on the same level as the stamens so that self-pollination is inevitable.

Unfortunately it hybridizes easily and characteristics can be mixed. The flowers look attractive and form a prominent feature beside some ponds and streams. After flowering the long slender fruit forms, 5½ cm. × 2 mm. It is quadrangular with a short pedicel. The bracts are 1½ cm. × 3 mm. It splits into four thin parts (with an equally thin central part) containing rows of small (1 mm. long) seeds with a tuft of fine white hairs that enable them to be distributed by the wind. Unripe seeds are white, ripe seeds dark brown.

The seeds germinate easily and if the pondkeeper doesn't want too many new plants he should collect the seeds before they spread. To artificially germinate them sprinkle in a seed tray containing fine earth or mature gravel with a cm. or so of water. The seeds sink to the substrate and small plants soon appear. The problems seem to be in thinning them out rather than inducing them to grow.

If the rootstock is not damaged too much, wild plants can be collected from beside streams (young March plants are ideal) and transplanted to the pond. Plant in a 15 cm. (6 in.) pot sunk into the ground containing earth with some clay, peat or loam mixed in too.

Although not usually regarded as a plant for the pondkeeper, Codlin's and Cream can prove itself a worthy addition.



## 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 details you can give me regarding the maximum size, geographical range and popular name of the livebearer called *Xiphophorus xiphidium*.

This livebearer of the family *Poeciliidae* attains a length of about 2 in. A full-grown female is noticeably larger (longer and heavier-bodied) than the male. The general build is stocky and not elongated, or rather elongated, as in some species of *Xiphophorus*. The male has a short "sword" or prolongation of the bottom rays of the caudal fin. *X. xiphidium* appears to be distributed over a fairly wide area of southern Mexico. It was first collected and later described for science by Dr. Myron Gordon in 1932.

Is it true that wired glass for the base of a tank enables a greater weight of rockwork to be used without the bottom falling out?

Wired glass is no greater weight-bearer than plain glass of the same quality or thickness. Its advantages are that if cracks develop the glass does not fall out under the pressure of the water or excessive weight of compost or decorative stones but is held in place by the mesh of wires. Water, however, still pours out of the cracks.

Is *Acanthopsis choirhynchus* any danger in a community tank?

This species minds its own business. In fact it carries this habit to the extent of avoiding the company of other fishes by digging itself into the compost or secreting itself in plant thickets for sometimes quite extended periods of time. It is, however, active at dusk or later. A full grown *A. choirhynchus* might make a meal from easily swallowable fishes but let us bear in mind that very few fishes will respect the lives of other fishes very much smaller (hence easily swallowable) than themselves.

Please give me some information on the quality of water and temperature requirements of the red-breasted piranha.

This piranha, known to science as *Serrasalmus nattereri*, is not faddy about its water provided it is not unreasonably hard or alkaline or acid. In short, any matured tapwater, clean and not made lethal by having been stored in copper pipes for any length of time will do. A temperature in the seventies (°F) is satisfactory.

I have an angle iron frame 60 in. by 24 in. by 24 in. What thickness of plate glass do you advise for glazing?

Glaze your frame with  $\frac{1}{4}$ -in. glass.

I obtained a piece of bogwood several weeks ago and though it has been left to soak in a bucket of water since I purchased it, I have noticed that a change of water still turns brownish after a few days. How can I accelerate the curing process?

By cultivating even greater patience. In brief, continue to soak the wood in successive changes of water until the time arrives when only a slightly amberish tint in the water is brought about. This water should suit such fishes as neon tetras, anostomids, harlequin fish, and the like.

I bought a spiny eel which my dealer called a tyre-track eel. However, after checking up in my books, I discovered that the so-called tyre-track eel has zig-zag markings on the sides whereas my spiny eel has a lot of yellowy spots on a dark ground. Can you identify my eel for me?

In all probability the spiny eel you possess is *Mastacembelus argus*. This is a mastacembelid which fits the description of the "eel" in your possession.

*M. argus* attains 9 in. or more and lives in the natural state in Thailand.

**Could I keep an axolotl in my tropical aquarium?**

The forbears of the axolotl (the ones seen in dealers' shops have been bred in captivity) lived in cool lakes in Mexico. Hence the creature flourishes best at ordinary room temperature or, put in other words, is best suited to a coldwater aquarium. Again, the axolotl has a large mouth and is not averse to snapping at anything its instincts lead it to believe would make a good meal.

**Shortly after pouring in about a quart of freshly-drawn water into my aquarium several of the fishes assumed a head downwards position and swam about in a jerky fashion. Most of them returned to normal after a few hours but a few of them still swim off balance. What caused, and is still causing, this trouble?**

You did not mention whether the fish you are keeping are coldwater species or tropical. Yet in either case water introduced straight from the tap is asking for trouble. All water added to the aquarium must be of the same temperature as the water in the aquarium itself. For an abrupt change of temperature brings about what is popularly known as swim-bladder trouble. A minor disturbance of the swim-bladder will sometimes right itself in a few hours but usually the affected fish have to be kept in very shallow water at a raised temperature in an attempt to effect a cure. Some cases are incurable and it is best to put the fish out of their misery by ending their lives.

**About six weeks ago, I spawned a pair of dwarf gourami. The parent fish behaved in exemplary fashion and when the eggs hatched out the fry left the bubble nest without any untoward interference from their parents. However, as a precautionary measure, I removed the parent fish to another tank. Although I fed the fry on a liquid fry food a large number died within the space of the first fortnight. I accepted this as sheer bad luck but what puzzles me now is that I have not more than about five baby fish left out of a few hundred. Can you explain the rapid demise of the rest?**

Gourami fry require microscopic live food, or a suitable substitute for live food. Yet this, unless offered in very small quantities several times a day, is apt to escape being eaten and almost always leads to pollution of the water. Gourami fry are very sensitive to unwholesome conditions. Furthermore, it is essential that the air-space between the glass cover and the surface of the water is warm. Also, that there

is no film or dusty scum on the water. For an initial mouthful of cold air or the inability to penetrate the surface film to take in air kills the fry in next to no time.

**I have two pieces of greyish white stone, attractively green-weathered in parts, which would add to the decoration of my tropica' aquarium. Do you think any harm would come to the fish if I introduced these stones from my rock garden into my aquarium?**

My advice is to leave the stones where they are. I feel certain that if you wetted them with a few spots of sulphuric or hydrochloric acid the result would be an instant frothing on the surface. This would denote the presence of calcium. Then again, it would not surprise me if they disintegrated into small fragments on receiving a sharp blow from a hammer or showed narrow grooves if scraped with a sharp bodkin. Such rockwork is harmful to the proper maintenance of an aquarium.

**I have just bought an arowana. What can you tell me about this fish?**

The arowana belongs to the family *Osteoglossidae*. The species most commonly sold by dealers is *Osteoglossum bicirrhosum*. It is found in the natural state in the middle reaches of the Amazon and beyond to Guyana. It can attain about 3 ft. One of its relations, *Arapaima gigas* attains about a foot more and is one of the largest freshwater fishes known to science. It, too, is native to South America. Species of *Osteoglossum* are upper level and surface swimmers and feed on flies, various grubs, aquatic larvae and small fishes that come within striking distance. In captivity they can usually be persuaded to take strips of raw white fish or raw red meat. The tank in which an arowana is kept should be properly covered as the fish is a leaper, particularly if frightened by an unaccustomed shadow or rather violent vibration of the water. Species of *Osteoglossum* require a strictly tropical temperature.

**Several months ago, I bought some small cichlids which the dealer assured me were *Tilapia mariae*. They were silvery white to silvery green with several black bars on the sides. Now that the fish have grown you would not recognise them as the same fish. The bars have vanished or almost vanished and the ground colour has changed to golden to greeny or brownish bronze. Do you think the fish I have are true *T. mariae*?**

The short answer is yes. The vertical bars of young *T. mariae* are replaced by dark blotches which may come and go, that is bold on some occasions and less bold on other occasions. The ground colour is bronzy, darker above and lighter below.

# COLDWATER QUERIES

by Arthur Boarder

I recently bought 42 tanks, each 24×24×12 inches, and would like to breed fancy goldfish commercially. What advice can you give me as to which type to breed and any other information applicable?

I do not think that you have much chance of making a living by breeding any type of goldfish. Many kinds can be imported from the East at a fairly low price that it would not be possible to compete. The warm conditions prevailing where these fish are bred mean that they can be bred out of doors in large ponds with no artificial heating. However, there is no reason why you should not breed plenty of fish with your capacity but do so just as a hobby and you may also cover your costs as long as you breed the right kind. It is of no use working with common goldfish, as they would not bring in sufficient cash to cover the cost of food. I suggest that you concentrate on one or more of the fancy goldfish which, if of good quality, will always command a good price. Fantails, veiltails, moors and orandas would be a good choice. Good specimens of any of these types will command a fair price, but very good ones are not always bred. For every excellent fish in a spawning you may have two dozen which will not fetch more than an ordinary goldfish would.

For a few years after the last war it was possible to get a fair price for fancy goldfish as the importation of fish was prohibited. Once the restriction was lifted the bottom fell out of the market as far as British-bred fishes was concerned. I was able to make a little pocket money in the good years but even then with very good fish to sell, it was impossible to make anything like a living.

## Do frogs upset the balance of a pond?

Frogs usually only come to a pond to breed. Once this season is over most frogs leave the pond. Very rarely an unattached male frog will clasp a female goldfish and could kill it. However, this is about a thousand to one chance. In all my years of breeding fantail goldfish out of doors, I have only once found a fish clasped by a frog and was able to save it before it was killed. Frog tadpoles make an excellent live food for fishes but if spawn is found in the pond it is a good plan to remove it for hatching elsewhere so that the tadpoles can be allowed to get a reasonable size before being fed to the fishes. If the spawn is left in the pond it is quite probable that the tadpoles will be eaten as soon as they are free swimming and before they make much of a meal.

Which is the correct method of calculating the number of inches of body length of fish for a coldwater tank; 24 square inches of surface area or a square foot of surface area?

A square foot would take six inches of body length of fish and so the 24 square inches is correct, for each inch of fish.

What is the longest fish (body length), which would live happily in a pond 5 ft. by 2½ ft. and 1½ ft. deep?

I suggest that a fish with an overall length of six inches would be adequate for your pond. A larger fish might live all right but it would not look right. The same applies to a fish in a tank. If a fish is so large that it looks out of proportion to the tank, the whole living picture is lost and the fish would look like a specimen fish set up in a glass case by a taxidermist for an angler.

Do water plants have to be cut back for the winter, and if so, how far back?

It depends on the type of plant. Underwater oxygenating plants will usually die down somewhat on their own and so may need no attention. It is the plants which grow above the surface which may require cutting back. Many of these will die back with the approach of winter and then the dead or dying leaves can be trimmed right back to make them tidier. If underwater plants become too rampant, it is as well to wait until the spring before thinning them out, as the dense foliage will be appreciated by the fishes during severe weather.

Is a fountain necessary in a small pond?

This is a matter of choice, but in a very small pond a fountain may not be advisable as once the water was run to the fall by a pump, the level of the water in the pond might drop to a level which would spoil the look of the pond, apart from stirring up the mulm on the bottom.

I have a few fancy goldfish in a tank in a living room. When is the best time of day to feed the fish during the winter?

If the tank is well planted it is only necessary to feed the fish once a day. The time of day may depend on when it is convenient, but a little understanding as to how the fish feed may be of assistance. Goldfish types can feed on small portions all day long as they have no large stomach in which to digest a large

amount of food swallowed at one time. These fish feed according to the temperature of the water. When it is cold, the fish are very sluggish and need very little food, if any. Warm water means that the fish become more active and so they must have more food to replace the energy used up. It must also be realized that the fish will not eat at their maximum unless the water is well oxygenated. One must link with this the fact that warm water holds less oxygen than does cold.

If you have a lamp bulb in a cover over the tank, this will warm up the water a little and so it is better to feed your fish after the lamp has been switched on for some time.

**At the bottom of my fish tank there is a quantity of cobweb-like matter round the roots of plants and there are a number of tiny worm-like creatures in the gravel which contract when a fish goes near them. What is the cause, as I only feed the fish on flake foods and Tubifex?**

The white matter looks like mildew and is usually caused by decomposing uneaten food. You may have been feeding the fish too heavily once the water has cooled down. The tiny worms have probably been introduced with *Tubifex*. These worms live in filth and can bring with them many pests and diseases. In some instances they have brought with them small leeches which have caused much trouble in tank or pond. From your description I suspect that the tiny worms are a type of annelid, possibly *Naididae*. To clear the tank of these you may have to empty the tank and boil the gravel. If you do not want to take this trouble you can leave all as it is and stop feeding the fish for about a month. When the fish are hungry they will suck up the gravel and eat the tiny worms. If the fish are continually fed they will ignore the worms which will retract into their holes at the approach of a fish.

I am continually warning aquarists about feeding their fishes with *Tubifex*, but many will continue to do so until one day, which I think will surely come, trouble will ensue and the aquarist will say, "Who would have thought it"?

**I am considering making a fish house for breeding fancy goldfish and cannot make up my mind on whether to have a greenhouse or timber and asbestos shed. What do you advise and what temperature must I maintain for the winter?**

A greenhouse has the advantage of being much warmer in the summer but would lose a lot of heat during the winter. A timber and asbestos shed would be better and you may be able to construct it with cavity walls, to keep it warmer in winter. I do not advise warming the fish house but only certain tanks.

The adult fish will often be in better condition for breeding if they have been kept fairly cool during the winter. A temperature of as low as 50°F would be all right, as long as this temperature has been reached gradually during late autumn. However, for the maximum growth of the youngsters, some higher temperatures are necessary and one of 70°F, is very good. It is possible to get your youngsters through the winter at a lower temperature, but they will not eat and grow at a low temperature. I have found that goldfish feed very well at a water temperature of the lower sixties (°F) when the water is well oxygenated. At this temperature the adult fish appear to spawn better than when the water is too warm.

**I have recently purchased two bubble-eye goldfish and one of them has a small bubble under its chin. This bubble fills with small stones when the fish feeds from the bottom and appears to cause distress. What can be done about it?**

I do not think there is anything you can do about the bubble under the chin of your fish. This is an abnormality and I have seen the same thing in a fancy goldfish at times. The under part of the lower jaw is very weak and so the skin is too thin to be kept in control. You can relieve the fish of the stones in the bubble by removing all gravel from the tank and replacing it with sand. It has been observed by some aquarists that this variety of goldfish, with such abnormal development round the eyes, is very prone to have trouble at or near the mouth. Some are unable to close their mouths when adult.

**If my garden pond freezes over during the winter, is it advisable to remove the ice when it starts to thaw?**

If the pond has been frozen over for a few days it is certainly a good plan to remove the ice as soon as you can. After a few days of being ice-covered the water may become foul and then the fish would soon be in trouble. Once a thaw arrives and the ice softens somewhat, it can be removed by first playing the hose on it and then pricking the ice with a sharp instrument to break it up when it can be dragged out. Should the water look brown it is best to remove most of it and replace with fresh.

**Where can I obtain rockwork for my coldwater tank and would coral be suitable?**

Rockwork should be lime free and have no sharp edges or points which could injure a fish. Westmorland stone is a very good type and can usually be obtained from a nurseryman. Coral is quite unsuitable for a fresh water tank and could upset the condition of the water as the tiny holes in it could contain decaying live or vegetable matter.

# STARTING A ROCK-POOL AQUARIUM

*Written by & illustrated by Bill Simms*

INTEREST in keeping a cold marine aquarium is growing rapidly, for the opportunities of starting and maintaining one properly are abundant in Britain where most people are within reasonable reach of the sea coast. Along our shores is as good a selection of interesting sea-water creatures as can be found anywhere in the world, and the total cost need not exceed the price of a suitable tank.

Suitable is the operative word in the case of sea water because salt will corrode metals, and therefore the safest sea water container is a plastic tank. However, a metal framed glass one can be used—providing that all the metal parts are completely covered with a good bitumastic paint.

A second important point is the matter of water temperature. At the coast a rock pool may heat up a little in the sun, but there is normally a cool breeze, and every 12 hours the tide floods it with cooler water. Consequently the creatures rarely have to tolerate even slightly warm water, and then only for short periods. Rock pools situated in a sun trap near the upper limits of the tide rarely have many inmates, whereas those in cooler places, nearer the lower tide marks, are full of life.

Therefore a cold marine aquarium must be sited where it can be kept cool. If it is indoors it should be in a room that is not heated at all, and then only in a



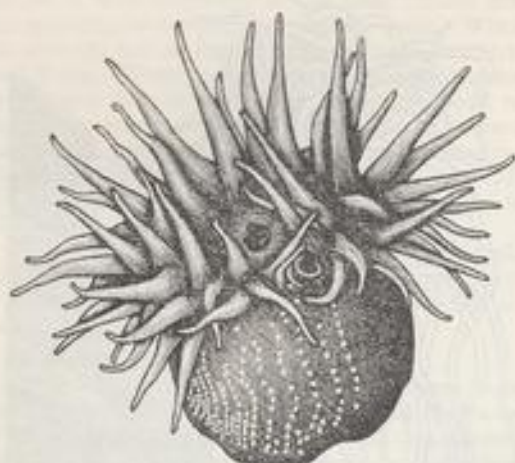
Opelet Anemone

north window for first choice, or an east or west one as second best. Never in a south facing window. There must be lots of light, so a window-sill is undoubtedly the best choice, unlike a tropical aquarium, which has its own built-in light in a hood. It is best, in the interest of full light, to use a cover glass only on top of a cold marine aquarium, and not a hood.

Out-of-doors—which is the ideal place to keep a rock pool aquarium—there are many possible sites, but they must not be in full sun. For sunlight to pass over the pool for an hour is all right, and in fact beneficial, but more than that would warm it too much. Another factor to take into account is rain, for this could dilute the salt water. Always arrange for a cover of glass or perspex to be a couple of feet or so above the pool, extending out for a foot or so all around. A cover glass directly on the aquarium could be used instead of a cover, so long as it extended out all around for 4 to 6 in., and was raised along one edge so that rain would run off easily. This would help to keep the cover clean, too, and thus let in more light.

A detail about temperature that has not been mentioned so far is frost. Normally any difficulty about a cold marine aquarium is that of keeping it cool enough, but with one kept out-of-doors extreme coldness must be guarded against as well. The simple way is to move the tank indoors for the winter



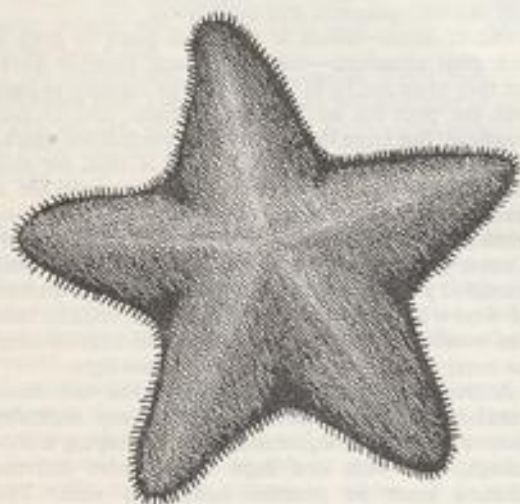


Dahlia anemone

to a cool room (a bedroom, perhaps) but if this cannot be done, then some protection from frost must be arranged—without cutting off the light too much, or for too long. So long as ice doesn't form anywhere the pool will be safe.

An old disused sink can make an extremely effective outdoor rock pool if it is stood on a strong base. The plug hole and overflow outlet should be plugged properly, and painted with bitumastic paint to prevent metal corrosion, and to make the sink completely waterproof. Being wider than it is deep such a sink will be more like a rock pool than will a tank.

The next point is the sand and rocks. Sea shore

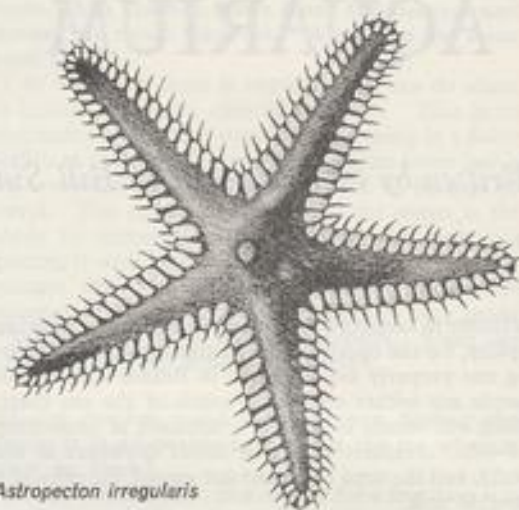


Cushion star

sand should be used, carrying it from the beach in a polythene bag or bucket, and with enough water in it to be just awash. Select it from a place near the lower tide marks because it will be full of microscopic life, and this is essential to the well-being of the aquarium for it keeps the water and sand healthy and provides some food for the inmates.

Great care must be taken to see that this sand does not heat up at all on the way home, so if you can place it in the boot of the car, and wedge open the boot a little to cause a draught, it should travel well. If it is in a polythene bag that is sealed, trap a lot of air inside as well, and every hour open the bag to renew its air.

This applies to the transport of sea water, also. Take the water from the sea itself, not a pool, wading out as far as possible to secure clean water, and keeping it cool all the way home. Rocks should be selected

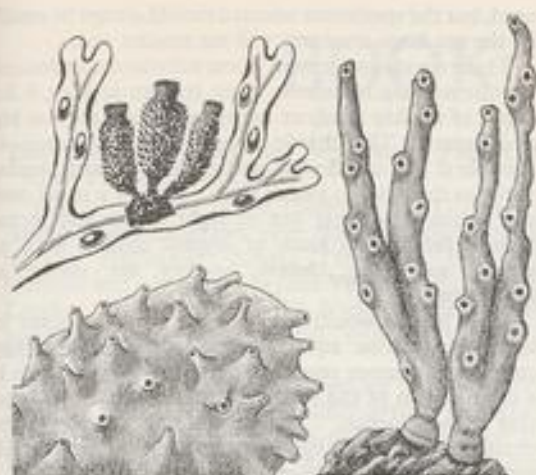


*Astropecton irregularis*

from the beach for your rock pool, but avoid all those that are glossy white, for they can bleed alkali into your aquarium as time goes on. The best kind of rock to use is sandstone. Rocks with living creatures fastened to them should be handled with as much care as sand.

Arrange the rocks around the sides to form crannies and shelters for the creatures you will instal, but do leave as large a central area of smooth sand as possible. If a somewhat craggy or nobbly rock can be placed in the centre you will often see creatures moving across the sand to seek its shelter. Make sure that all rocks are firmly placed in position, for rocks that move even slightly will be mistrusted by everything, and may even kill some animals.

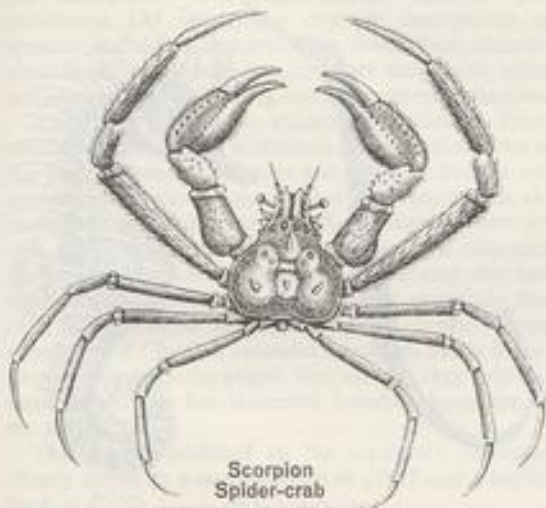
Having placed the sand, water, and rocks in your aquarium you should now consider whether or not to



Breadcrumb sponge

add aeration. In some circumstances—out-of-doors, instance—it is not easy to aerate, but where it is possible the addition of an airstone connected to a small air pump is a great help. Sea water is very well aerated by waves and movement, and rock pools by the tide at regular intervals, but an aquarium needs some artificial aid. An efficient airstone placed in one fixed position creates a slight current that all the creatures will adapt to.

A substitute for an electric aerator out of doors is an old car inner tube. This, if pumped up daily, with an outlet leading to the airstone, and controlled by a clamp on the thin pipe, can aerate well and safely for many hours. A small piece of rubber tubing can be sealed to a hole in the tyre to provide the outlet, leaving the valve free for pumping.



Scorpion Spider-crab

Next comes the choice of plant decoration. Many of the low growing bush-like growths in a seaside rock pool are really animal, not vegetable, but they are attractive in the aquarium. Also they provide hiding places and breeding places for microscopic sea life, and so are valuable reservoirs of food. Chip off the rock on which they are anchored, and move them complete.

Many kinds of seaweed in rock pools are overlong for an aquarium, but they can be shortened in most cases, and then will form fine clumps. Do not depend on them for aeration, however, as you would do with plants in a freshwater tank. They are needed mainly as cover for the more mobile inhabitants. Only use seaweed that is anchored to a piece of rock, and remember that all living things must be transported

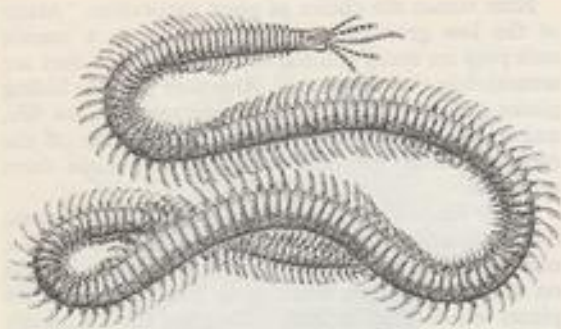


Skeleton Shrimp

home with the same care as recommended for the sand and water.

The first choice of many people when looking for live creatures for this aquarium will be anemones, because of their lovely colours and easy management. There are thousands of ordinary beadlet anemones on all beaches, but as well as these you can find less common ones here and there. The Dahlia anemone is one, and the Snakelocks or Opelet another that will do well.

Gently detach your prize from its rocky base, and transport it in cool sea water. At home place it on a rock by its base, and wait for it to obtain a grip. This may take a long time, so, if necessary, prop it in place



Bristle Worm

and wait longer. By the next morning it may be in a totally different place, for these creatures can and do move about at times, gently slithering along to their desired location.

Feeding an anemone is easy. Once or more each day offer it some small piece of raw fish or a shrimp held in tweezers, and let go when the tentacles begin to take hold. When the anemone unfolds to discard the uneaten portions—much later—take away such debris. This is important at all times, and with all sea creatures that are carnivorous; you must remove all debris daily to avoid it fouling the water.

A certain amount of debris clearing can be carried out by starfish, for they pass over and absorb food on the sand; but do not rely on these creatures entirely. Two suitably small starfish for an aquarium are the Cushion Star, a small chubby sea star, and *Astropecton irregularis*, which burrows in sand. They are less often seen than the common starfish, but can be found in some places.

Sticking to rocks in small caves and under overhanging low tide rocks can be found a variety of creatures that look like crude plants or lichen. Some are stuck to seaweed, but should be brought to an aquarium only if their anchorage comes too. Bread-crumbs sponge and Deadman's Fingers can be of various colours, and will add variety to the rocky surround. Watch them carefully to see that they do not die, for they can be a source of bad pollution.

Various crabs and shrimps make good aquarium inmates, for they are active in finding food. Give them raw fish or shrimp, leaving it exposed on the sand, and they will get along well. The Scorpion Spider crab is a tiny, but most interesting creature, totally unlike the ordinary Green, or Shore crab. It is delicate in build, and can add an exotic touch to any collection.

The Skeleton Shrimp is also tiny, and may be found poised on seaweed, waiting for food to pass by. Tiny scraps of raw fish dropped in the water to drift down past it will quickly be grasped and dealt with. Most members of the large family of crustaceans can be

used, but the specimens selected should always be small. In the sea large creatures will eat smaller ones.

There are many forms of worm suitable for inclusion, but do not use lugworms (they require at least 6 in. depth of muddy sand) or ragworms (these are too big and fierce). The Bristle Worm, *Eunice harassii*, is suitable if you can find it, and there are many similar varieties that will do just as well. Choose a small one, and watch it wriggle out of sight under the rocks. Worms feed on all kinds of organic matter, such as animal and plant debris, so they are useful at scavenging.

Most people would like to have a live seahorse in their cold marine aquarium, but unfortunately they come from warmer seas than ours. However, there is a close cousin of the seahorse around our shores, and that is the Pipefish. There are a few varieties to be obtained, differing slightly from each other, but all with similar, slow-swimming movements.

These queer creatures are not easy to keep, for they feed on minute planktonic animals in the water, and therefore must be provided with regular changes of new sea water carrying such creatures. For anyone with twice weekly access to the beach, however, they are a fascinating addition to any aquarium.

One final point has been left to the last: the transfer of animals from the carrying container to the aquarium. All creatures that live in water must not be subjected to sudden changes of temperature. Therefore the container and its contents must be floated in the aquarium for an hour or so to allow the two water temperatures to equalise slowly before the transfer is made. If you follow all the tips given here your cold marine aquarium should be a success.



Pipefish and Seahorse

# BOOK REVIEW

**The Hamlyn Guide to Aquarium Fishes** by Klaus Paysan. Price £2.95.

This is the latest of the Hamlyn Field Guides and describes and illustrates more than 500 species of the world's freshwater fishes. Translated from the German and edited by Gwynne Vevers, Curator of the London Zoo Aquarium, the book was first widely acclaimed under the original publisher's title of "Welcher Zierfisch ist das?"

One might be excused for thinking (at first glance, anyway) that the all-colour illustrations are reproductions of exceptionally fine paintings because the numerous species depicted on each page have been reproduced without their respective backgrounds, all sharing the white of the page. However, they are all from colour photographs of top quality and stem from the author's camera.

An early section of the book deals with identification by shape and comprises clear drawings of basic symmetry with brief notes under sub-sections so that, for example, we find under "Pike-like" such families as Pimelodidae (*Sorubim lima*), Characidae (*Hepsetus odoe*), Cichlidae (*Crenicichla lepidota*), Poeciliidae (*Belonesox beliganus*). This is followed by a section in which families and genera are illustrated with drawings emphasising the salient characteristics of each family. Both this and the preceding section cross-refer with the colour plates.

Forming the heart of the book we have the colour plates, each page illustrating several genera and species of one or more families or, as with a large family like the Characidae, four pages being required. The remaining 120 odd pages contain descriptions of species' individual characteristics (behaviour, ultimate size, food, and water requirements etc.) each being accompanied by a drawing and all grouped in families.

There are numerous guides to aquarium fishes available today and it is difficult to recommend one as the best for general coverage and accuracy but the one under review closely approaches the target. In the main the colour plates are excellent although there are one or two which have suffered a little from colouring up in reproduction while others are among the best representations seen of certain species, especially that of a male *Tilapia mossambica* which evokes happy memories of "Joe", a splendid specimen in his indigo livery with carmine-edged fins and a very popular attraction at the late-lamented London Aquarium in the fifties.

This useful addition to the aquarist's reference library comes in a cased edition at £2.95 and a paperback at £2.25.

**The Lobster: Its Life Cycle**, by Herb Taylor. Published by The Oak Tree Press at £2.75.

Lobsters must still be regarded primarily as delectable sea food but since the increase in saltwater aquaria keeping, many more aquarists have become interested in marine crustacea, looking upon them as worthy of attentions other than culinary.

Splendidly illustrated with colour photographs, the majority by the author, this book reveals many of the fascinating facets of the lobster's life and highlights the grave threat to its continued existence—a threat posed by man the world over as he culls lobsters in large numbers with little or no thought for the species' future.

In the wild state a lobster takes eight years to reach a weight of one pound. The fact that under laboratory conditions specimens have reached this weight in two years augers well for the suggestion that these important sources of food should be farmed internationally.

John T. Hughes, Director of the Massachusetts Lobster Hatchery and Research Station, has co-operated with author and the book describes much of the work being carried out at that establishment in an endeavour to find the best methods of farming the eastern North American Lobster (*Homarus americanus*) so that a halt can be called to the heavy toll being taken from natural sources. So heavily has the lobster population been reduced at Maine, for example, that ten lobsters have now to be caught before one of legal size is found. This size on average (it varies from place to place) is about 3 3/16 in. (eye socket to carapace end) but most female lobsters do not reach sexual maturity until they are 3 7/8 in. between the points mentioned.

It can be gathered that this book goes into the economics of lobsters as food, but it also makes for most interesting reading from which the lobster emerges as the object of a higher regard from this reader, at any rate.

**How Fishes Live** by Peter Whitehead. Published by Elsevier Phaidon at £3.95.

This is No. 3 in a series of volumes dealing with all aspects of the animal world. Of large format: 11 1/2 in. x 8 1/2 in., it is illustrated in colour with over 160 photographs and diagrams.

Chapters deal with Classification, Going Places (propulsion), Feeding, Breeding and Development, Defence and Survival, Senses, Distribution and Evolution of species. The work is, in essence, an environmental study of fishes and succeeds well in arousing the reader's appreciation of that strange

watery world with the multifarious pressures it brings to bear upon the widely diverse fish forms it supports.

It has often been said that the world of water offers the best of opportunities to the student of biology for by virtue of the limitations it imposes, the plasticity of life can be more easily regarded within its confines. The chapter on Extreme Conditions makes this point the more clear in dealing with those species which have adapted fully to extremes of darkness (cave fish), minimal oxygen content (labyrinth fishes) changes in water chemistry (Californian killifish), seasonal drought (annual toothcarps), torrential mountain stream conditions (*Gyrinocheilus*).

A chapter on Getting on with Others describes the different ways in which varying species share a common locality. Symbiosis readily springs to mind where mutual benefit derives from togetherness of widely differing species and commensalism, too, is not unfamiliar and involves differing species utilising the same food supply but not in a competitive manner. But then there is phoresis where a sedentary species attaches itself to a different and more mobile species in order to be transported to likely sources of food. The ramora is quoted as the classic example among fishes. When seen, sucker-stuck to the front glass of an aquarium (see November *Aquarist* cover), it appears that the ramora has a ventral sucker but this device is, in fact, a modification of "a dorsal fin (on the head) where left and right halves of each finray have come to lie horizontally to form a series of ridges like a louver with a raised rim."

Distribution forms one of the most exciting realms of study where fishes are concerned and some of the facts and figures which have emerged lend great weight to the theory of continental drift but in any event provide much food for thought. Ponder at leisure on the fish families shared almost exclusively by Africa and South America—characins, cichlids, lungfishes. Characins are absent from Asia and North America. Cichlids are represented outside of South America and Africa by around three species only of a genus endemic to southern India and Sri Lanka. Lungfishes are now found only in a small area of eastern Australia other than in South America and Africa.

Peter Whitehead, of the Fish Section of the British Museum (Natural History), is a scientific writer but exhibits in this book his ability to write informatively and absorbingly for popular readership. The result is a most readable work.

**Insects and other Invertebrates in Colour** by *Ake Sandhall*. Published by *Lutterworth Press* at £3.95.

Yes, a guide book primarily to insects and seemingly not quite within the field of this magazine's readership. However, partly because many people who specialise in studying one branch of the animal kingdom have a

wide ranging interest in other branches, but mainly because quite a chunk deals with aquatic insects and molluscs as well as marine invertebrates, this book is considered worthy of review within these pages.

Over 400 species are illustrated with first class colour photographs by the author and are grouped according to their habitat under such headings as On Flowers and Fruit, On Grass and Herbs, By Lake and Stream and On the Sea Shore. The combination of detailed colour close-up photographs and protracted captions makes it an invaluable reference book for speedy identification and a systematic and pithy survey towards the end of the book comprises a readily comprehensible guide to classification. An extensive glossary supplies explanatory notes on terms relating to invertebrate zoology. This is very well presented and can be of inestimable value. In addition there is a most comprehensive bibliography the like of which one would wish to see in more reference books. Some extensive research has gone into its compilation along with an obvious desire on the part of the author to help readers widen their interest and increase their knowledge. There is also a helpful chapter for those wishing to undertake close-up photography of small living life-forms.

Planned with much thought and splendidly produced, this is excellent value for money.

**Fishes of the World** by *Hans Hvass*, illustrated by *Wilhelm Eigen*. Published by *Eyre Methuen* in paperback at £1.75.

Such an all-embracing title can only include a few representative species of the world's teeming thousands of different ocean, river and lake fishes and an attempt is made to range over those which rate for mention from several standpoints so that we have those esteemed as sporting fish, those popular among aquarium and pond-keepers, those which are rarities and some which contribute to the world's dietary needs. Saltwater species are not separated from those in freshwater nor are tropical species separated from coldwater species, classification being based upon structure, i.e. Ray-finned fishes, Cartilaginous fishes, Cyclostomes etc. so that seahorses and sticklebacks share inclusion under ray-finned fishes as do the Norway haddock and the dragonfish, the swordfish and the Siamese fighter. Correctly so but possibly off-putting to the aquarium hobbyist who has been encouraged to particularise in his classification down to genera and species and whose interest has been narrowly channelled to concentrate upon those fishes which can be kept alive in his lounge.

Information supplied for those species covered must, necessarily, be of a general nature and so far as the aquarist is concerned, more enlightening in the case of, say, the "whalefish (*Cetomimus regani*) 6 in. A rare fish found at depths of about 9,000 ft. in the

Atlantic Ocean. The head is very big and the powerful mouth has large teeth. The eyes are rudimentary and there are no pelvic fins." than with the "Tiger Barb (*Barbus tetrazona*) 2-2½ in. Found in Sumatra and Borneo. The second of the four

transverse stripes is sometimes absent."

A useful book to those whose interest in fish is awakening or to student biologists who are considering specialising in ichthyology.

## CIRCUIT TESTER FOR AQUARISTS

by George Etoe

HAVING been let down in the past by heater and/or thermostat failures, I decided that a simple circuit tester, which would enable me to find which component had broken down (which also was safe to use, and wouldn't cost the earth) would be an asset in the fish house. I made mine in the following way at comparatively low cost, and I think it could be made quite easily by the home handyman.

It combines two separate circuits, one mains and one battery. I have kept mine to the simple requirements of fish keeping, but no doubt other refinements could and probably will be added as time goes on.

One word of warning: electricity is dangerous and the way I've seen some fish-keepers mess about in their tanks with the power still on make me wonder why there isn't a fatality every week amongst aquarists! A simple rule which should be adhered to at all times with electrical equipment is—"IF IN DOUBT SWITCH OFF FIRST." However, for the brave amongst you this is the method I used for the making of my tester.

### Materials Required

- 2 pieces of plywood approx. 6 in. × 8 in.
- 2 pieces wood ½ in. × 1½ in. × 8 in. (SIDES)
- 2 pieces wood ½ in. × 1½ in. × 6 in. (TOP and BOTTOM)
- 1 lampholder (large)
- 1 bulbholder (small screw type)
- 1 bulb (15 watt 240 volt)
- 1 bulb (2.5 volt screw in type)
- 2 connectors (chocolate box type) one with three outlet terminals
- 2 switches (small tumbler type)
- 1 battery (flat type)
- 1 3 Pin plug (fitted with a 2 amp fuse or less)
- 1 yd single core wire
- Length of three core cable
- Rubber band, glue, nails and screws

### Assembly

Glue or nail the four pieces of wood together, so that you have a rectangle on end; glue or nail the piece of plywood on top. Now fit the switches, bulbholders and connectors, not forgetting to drill holes for wires to go underneath (see sketch).

### Wiring—Mains side

Push mains cable through hole in side of box and attach BROWN wire to one side of switch; BLUE goes to one side of large lampholder. Now attach length of single core wire to other side of lampholder and take to one side of connector. Then a piece of single core wire goes from other side of connector back to other side of switch. Take green/white earth wire to central terminal of connector.

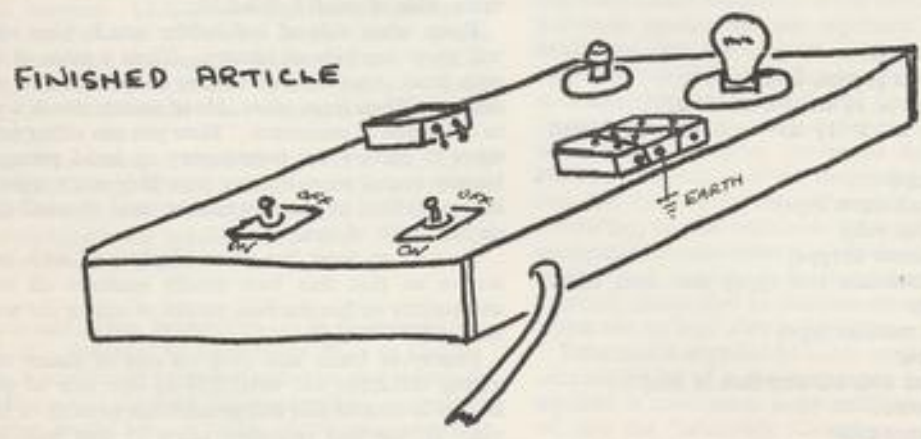
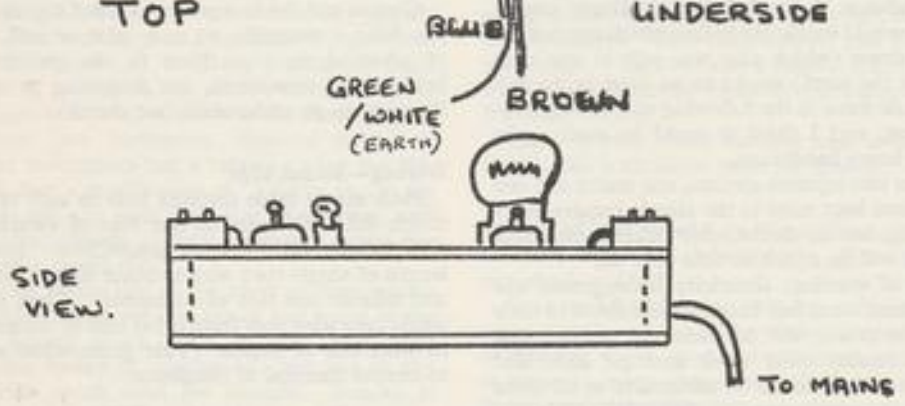
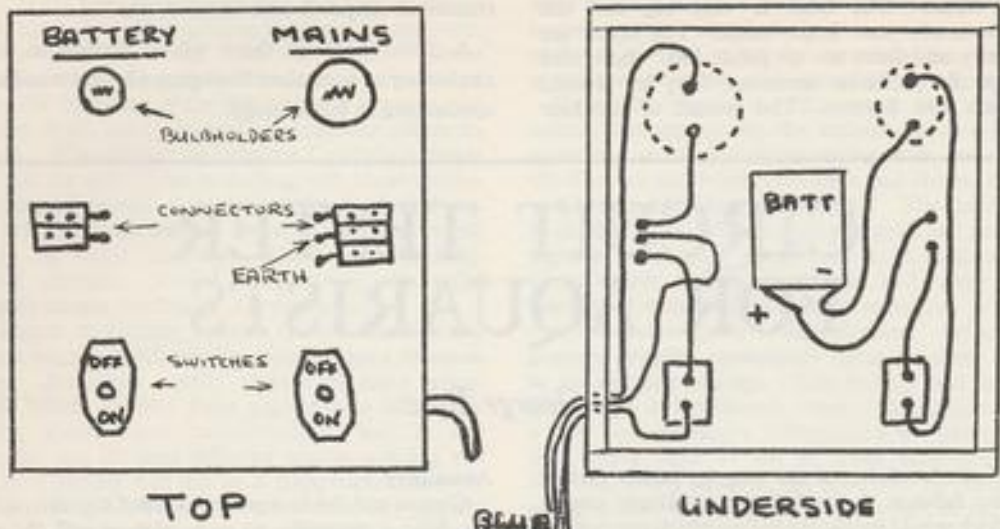
### Battery side

Attach one length of wire from one side of switch to one side of small bulbholder.

From other side of bulbholder attach wire which will go to one side of battery. Then a piece of wire goes from other side of battery to one side of connector. Then from other side of switch attach a wire to other side of connector. Note you can either solder wires to battery for permanency or bend prongs of battery round wires making sure they are a tight fit. Battery is held in place by rubber band on small tacks on underside of box.

Now fit on your last piece of plywood with small screws so that this base totally encloses all wires and battery within the box, except of course the mains wire outlet.

Finally fit bulbs and plug on end of mains cable wiring correctly, i.e. BROWN to live side of plug, BLUE to neutral side and green/white to earth or large pin. By the way you must use a 15 watt bulb both for safety and to make the tester work properly.



**Note:** It is a good idea to mark each side "Battery" and "Mains" so that one is in no doubt which side is which, although by using a three terminal connector on the mains side you will be able to see at a glance which side you are using.

Now to test your tester. Make sure that switches are in "Off" position and it is not plugged into the mains yet. Get a small piece of wire and bend into a "U," now push into open ends of battery side connector. Now switch on and if bulb lights you know that battery side is correctly wired up.

Repeat the process for the mains side, not forgetting to plug into the two outside terminals. If bulb lights up then you are in business.

Now remove your test loops.

#### To test a Heater

Switch off tester. Push the wires from heater into outside terminals of mains connector. Switch on at the plug and now switch on tester switch. If bulb lights up you know there is a circuit through the heater. There is no need for heater to heat up. (I've seen a carpet ruined by someone dropping an

aquarium heater on the carpet, and believe me they soon get hot when out of water!).

#### To test a Thermostat

Switch off tester. Remove heater from thermostat completely. Put the two blue wires which go to the heater into battery side connectors and twist the brown and blue wires which are left together. When you switch on, bulb should light up.

If it doesn't then either the temperature is set wrongly or the thermostat has failed.

To test this, unplug rubber stopper in thermostat (no need to disconnect from tester because you are only on 2.5 volts) and screw the little brass screw exposed slightly anticlockwise until bulb on tester lights. Of course you can get really technical and set the temperature correctly by immersing thermostat in a tumbler of water at the correct temperature you want. Remember then that the light on your tester will go OUT when the correct temperature is reached.

Finally, please remember that your tester is only as safe as you are, it can be used for other things and in inexperienced hands can be dangerous, but it could save you a lot of money in the long term. Good fishkeeping.

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## THE PITCHER PLANT

by Andrew Allen

IF ONE single wetland plant most grips the imagination of the botanist in North America, it is the Pitcher plant, *Sarracenia purpurascens*. From bizarre form, through memorable colour, to unusual carnivorous life style, this is a creature to be savoured by the scientist, or by those whose joy is in shape, texture and the other components of beauty.

Pitcher plants may be viewed in abundance in the eastern United States and Canada. They live on the great nutrient-poor bogs, under conditions of extreme nitrate deficiency. Within the bogs their ecological range is broad: they grow from shallow water at the pool margins, on muck mats, in wet sphagnum depressions, or even up on the hummock crests in company with the wiry heath vegetation. Rarely they venture out of the bogs and may be found in poor fens, under slightly more enriched (eutrophic) conditions. But their home is never in rich fen or marsh: the insectivorous strategy of the Pitcher plant is finely honed to survival in the acid waters of the bog, to capturing nitrogen from insects where it cannot be gleaned from the soil. In ordinary soils or nitrated waters all such adaptations are superfluous.

The plants grow in striking clusters above the water

or moss, and are visible from dozens of yards distant. The flowers dance jerkily in the breeze; each consists of a tall, rigid stem topped by a metallic blossom up to two inches in diameter. Strange growths to call flowers: the five broad petals are thick and rubbery to the touch, the colour is not fresh and vivid, but of slightly bruised flesh.

Around the foot of the flower stalk are assembled the pitchers, a ring of traps that may number between one and a dozen per plant. These are the real working heart of the plant, though there is a normal rooting system to exploit those few ions and nutrients that the sphagnum leaves behind.

The pitchers are aptly named. Each consists of a broad mouth with curling, fleshy lip, overhung by an arching hood. The mouth, which may measure two inches in diameter, leads into a funnel that converges to a point several inches below the surface. The walls are clad in an innocent velvet of fine hairs, and at the foot of the pitcher is a pool of water. The exterior may be green, veined with a network of fine red lines. Or its thick walls may be coloured a most lurid and livid purple-red, of rather nightmarish shade.

Sometimes the lip is set flush with the surface of

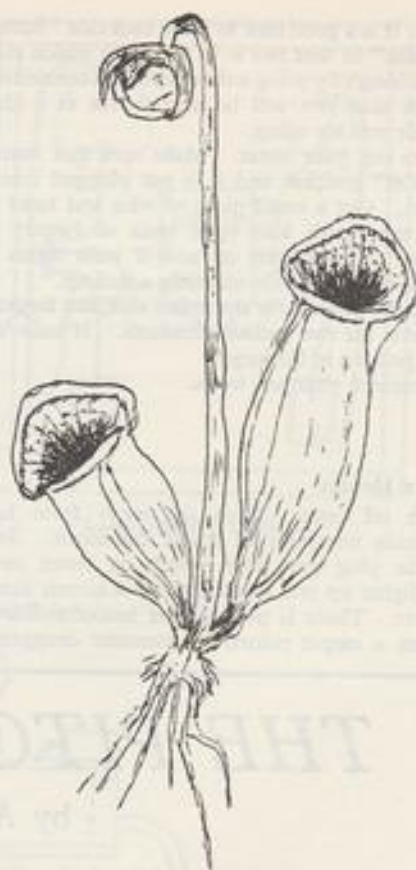


water or sphagnum, so that clumsy insects just stumble into the pitcher. This employs the same principle as the pitfall traps, jam-jars sunk to their rim, used by zoologists to catch ground beetles. More often the lip is in the air. Here flies are lured by a sweet coating of nectar, and doubtless by the colours of skin, blood and flesh. The victim follows a nectar trail into the mouth of the pitcher . . . onto the vertical wall of the tunnel. And it slips. The walls are glassy; each of the fine hairs points downwards. There is nothing to grip. From the pleasures of the bait, the fly slides rapidly down into the pool at the tube base. It drowns in the accumulated rainwater (conserved by the hood, which probably serves to minimise evaporation).

From the walls of the pitcher, digestive enzymes are liberated into the pool. The chitin exoskeleton of insect victims remains little affected, but the nutrient-rich proteins are broken down and absorbed. Nitrogen forms part of the backbone of all proteins, and animal flesh is thus a concentrated store of the element, a far more rewarding source than the sparsely scattered ions in the surrounding water. It was Charles Darwin who first drew attention to this in his book 'Insectivorous Plants', stimulating an era of heightened interest towards this unusual group. Try and find a copy: most people associate Darwin only with the 'Origin of Species', but he penned engagingly readable accounts of insectivorous plants, the lives and significance of earthworms, fertilisation of orchids, and the inhabitants of a coral reef.

Examining the contents of several hundred pitchers, I found mainly woodlice, beetles, and dipteran flies gently dissolving in the pools. As the inescapable mosquitos, black flies, midges and deer flies harrass around the face, probe through the shirt into unhealed bites, and tangle in the hair, the tormented naturalist develops a warm fellow-feeling towards these unexpected allies from the plant kingdom. Rarely, other animals blunder into the pitfalls that are so blandly concealed among the sphagnum heads. In one broad pitcher was a baby shrew, in another a young Jefferson's salamander (*Ambystoma jeffersonianum*).

Around the pool live an entire spectrum of hangers-on, exploiting the concentrated source of food in this miniature aquatic world, and the safety from predation. A species of spider spins its web across the pitcher, and plunders the falling flies before they tumble into the water. It is camouflaged to blend into the background of reds and purples. One moth and one dipteran lay their eggs in the pool; their larvae are adapted to tolerate the digestive enzymes, and grow up safe from attack in a concentrated soup of pre-digested food. And sometimes one encounters a dried shell of a pitcher, slit open by some enterprising bird that has learnt of the easy pickings within. Thus does the pitcher form a microcosm in itself, a community of



highly specialised organisms all dependent on the habits of this one plant.

Two last distinctions merit comment. First is the rare beauty of *Sarracenia* when its fleshily curved pitchers are set against the vivid magentas of a soft carpet of *Sphagnum rubellum*. For this experience one would cross an ocean, and even endure airline food. Secondly, it is probably that the Pitcher plant has stimulated more bad prose than any other plant. Not only has it served as a model for science fiction horrors that consume men in deep Amazonian jungles or imagined planets; it has also turned the heads of more earthly botanical writers. The hairs have been described as a *Chevaux de Frise*, (after the iron spikes set in wood to repel cavalry), which is most inapt. The pools have been described as Lethean waters, after the river in Hades that induced forgetfulness of the past. Flamboyant references to hell-holes, awful fates and treacherous pools fill the literature. All testify to the mental disturbance induced when our traditional views are upset by plants that take to eating animals!

# From a Naturalist's Notebook

by Eric Hardy

MY ANNUAL visit to the haunts of rare aquatic plants at Norfolk's Hickling Broad last autumn was disappointing, for apart from the dry summer lowering many waters and encouraging a vigorous growth of semi-aquatics and marginal vegetation, the increasing dearth of its rarities like the holly-leaved naias continues. This is attributed to the de-oxygenating and overcrowding effect of the algal "blooms," fertilized annually by hundreds of Elsans emptied from houseboats and other sewerage and agricultural-fertilizers drained from the farms.

Indeed, Norfolk Naturalists' Trust declared that 2,360 acres of Barton, Alderfen and other Broad have completely lost their luxuriant growth of aquatics and the wealth of invertebrates they supported. University of East Anglia biologists showed 11 out of 28 broads to be completely devoid of aquatic vegetation, with only poor plant-growth in a further 11. Hickling is among those whose aquatic flora has suffered drastically, the rarer plants being largely eliminated. The new Anglian Water Authority powers should overcome some of the legal bottlenecks which restricted previous control of sewage producing excess nitrogen and phosphorous, which encouraged this excess growth of phytoplankton.

Much of the trouble is traced to an old legal case in which a crafty lawyer convinced a judge that Hickling Broad is not tidal (though it is) by arguing that salt-water did not enter, but only pushed the freshwater higher at high tides lower down the River Ant. Thus it could not have a controlling conservancy, like the Thames. This also leads to some access-restrictions, especially on Barton, Ranworth, Salhouse, Filby, etc. broads which should be removed if the new Water Authority uses its powers.

One of the caddis-flies formerly considered confined to Norfolk Broad, *Linnephilus binotatus*, has recently been found at Lancashire's similarly reedy Leighton Hall Moss (Silverdale) and in 8 other counties. It is almost impossible to identify it from its larvae, as in others of its genus.

Keston Common, west Kent, is an important habitat of bog-plants for the London area; but it seems to be declining, like others, and may have lost its heath-rush, star-sedge, cotton-grass and creeping willow. Dams have been made to raise the water-level and conserve bog-plants. Golden dock, a very localised plant, which grows at the Town Pond reserve at Godstone in Surrey, has also been noted on the edge of a water-

filled gravel-pit at Redhill. The aggressive *Lagarsiphon major* (the old *Elodea crispata*) grows in Marble Pond, Tadworth and Island Pond in Ashted Park, Surrey, as well as by the Claypolds Hospital at South Ealing. Water-dropwort, hemlock and spring sedge have been lost from their haunts on Bookham Common. However, 83 species of moss and 17 liverworts have recently been listed from the common by London Natural History Society. They have also listed 26 out of Britain's 88 Cladocera (water-fleas, etc.), mostly only females as these are parthenogenetic, or mainly sexless, in reproduction. Males are produced only for limited periods. They have the "minnehaha" form of common *Daphnia pulex* and of *D. longispina*, with small hooklets on the back of the head of young but apparently not adults. These hooklets are commonly overlooked in young water-fleas, and have been noted on Little Stanmore Common, Stevenage (Herts.), Great Bookham at Penryn (Cornwall), Wise Ecn Tarn, Windermere and Lower Eastern Pond, Thetford (Norfolk), since first reported in 1952.

I've often mentioned The Hotties, a stretch of the St Helens Canal between railway and glass-works in this Lancashire town, which receives industrial cooling water and has long maintained a population of neapolitans, guppies, angel fish, cichlids and any other introductions from local aquaria. Recently, an American terrapin was found living there, someone's ambitious introduction.

Compromise seems to have been reached over the plans for a motel at the natterjack breeding site at Ainsdale Shore-Road Sands Club, near Southport. The nearby Pontin Camp has dropped its extension plan and the 98-bedroom Motel planned at the Sands Club is to preserve the breeding pond, the largest left. It will be interesting to see how the new development planned around the Sands lake avoids disturbing its toads during their territorial period.

Cheshire has been a little more active than most regions in following up 1974's Save the Village Ponds year with a survey of their contents, for conservation. A report I have received from Merseyside County Museums shows that 150 of 3,000 ponds in the Wirral peninsula have been surveyed with 80% of little value due to pollution, overgrowth or filling-in. Six of the remaining 30 were stocked with interesting plants, or waterlife. *Physa fontinalis*, often described as a snail of streams and lakes, occurs also in small

ponds; water-spiders still thrive here though said to be decreasing over the Northwest, and 10-spined sticklebacks favour the more weedy ponds. North American water-fern, *Azolla filiculoides* is a widespread introduction which often "kills off" a pond by excluding light; and one can add *A. carolinensis* near Willaston to the report; water-soldier has several introduce sites, but the report overlooks that aquatics like bogbean, lesser water-plantain, alternate water-milfoil, Carolina water-fern and Water-soldier have often been deliberately introduced by dealers "farming" roots out into ponds to develop stocks from which to supply the trade later. There are also more sites for white water-lily, bogbean, floating club-rush, great and fat duckweeds, etc. than the report gives.

Planarians are a group of predatory flat-worms inhabiting ponds and stagnant waters and feeding on water hog-louse, pondsnails and other worms. Four species commonly inhabit shallow British lakes with stony shores. One of these, *Polycelis nigra* alone inhabited a lake in Anglesey until the natural colonisation of the water by a related species *temis* almost completely replaced it in 6 or 7 years. This interesting example of inter-specific competition in waterlife is one of several in *Animal Population Ecology* (Academic Press, £3.80), a new 155-page book by J. P. Dempster, a Nature Conservancy entomologist at Monkswood. Any-one with a cold water aquarium left to its own devices sees the populations of animal life change. A classic breeding of *Paramecium*, the slipper-animalcule, to find the logistic curve for population-growth is examined critically, and "we are still a long way from having a completely acceptable generalized theory to explain animal numbers." This is a very informative and wide-ranging book. Silting should be added to the influencing factors with cockle-beds. Fish-populations were the first to be studied in depth, to forecast North Sea and other catches.

Two outstanding new British books on insects should greatly interest observers of aquatic insects. Nearly 30 years ago, the wing-flight of the humming-bird hawk-moth was captured by the new 1/5,000th second high-speed flash photography by biologists at

Ampleforth College. This breakthrough in electronics was developed in bird-photography rather than showing us how insects flew, until in more recent years Stephen Dalton, a Surrey naturalist, perfected it. His magnificently illustrated, 160-page *Borne on the Wind* (Chatto & Windus £5) describes (with American spellings) the technicalities of insect-flight and its photography at 1/25,000th second. It has 74 original colour-plates and a few monochromes which begin a new era in understanding wing-positions when insects fly, including dragonflies. These are aerial pictures, but the author mentions a small wasp which parasitizes the eggs of aquatic insects and uses its wings to swim through the water. This is *Hydrophylax aquivolans*, whose females swims in search of damselfly-eggs (small dragonflies). The female and caterpillar of a small British moth *Acentria nivea* live in ponds and were originally mistaken for a caddis-fly.

It is, perhaps, unfortunate that this break-through in insect-photography wasn't used to illustrate an equally sumptuous 296-page *Dictionary of Butterflies and Moths in Colour* by Laithwaite, Watson & Whalley (Michael Joseph, £12.50) which has 405 colour-plates illustrating representatives of the families of the world's Lepidoptera, with the exception of only a few of the more obscure micromoths. It is a sign of inflation that though twice the price of last year's companion *Dictionary of Birds*, this is about two-thirds the size, with only half as many plates, though several moths are included on most plates—over 1,200 species.

Of aquatic insects, it has room for only our small China mark moth (whose young caterpillar lives under water) out of 5 British species, plus one American from almost world-wide relatives feeding on water-plants, as well as our marsh-fritillary butterfly and *Acentria*, the false caddis, water-veneer moth. No book could portray all the world's 165,000 Lepidoptera, but this is the best coverage so far, with a separate account of each species. Authors A. Watson and P. Whalley are from the British Museum. Prof. Laithwaite writes a long-winded, light-hearted often irrelevant introduction. Photos range from wild to set specimens in the British Museum.



JUST A LITTLE LATER THIS YEAR  
THE FEDERATION OF NORTHERN AQUARIUM SOCIETIES  
proudly announce  
**THE 25th BRITISH AQUARISTS' FESTIVAL**  
EUROPE'S BIGGEST AND BEST AQUARISTS' SHOW  
CELEBRATES ITS SILVER JUBILEE  
at  
BELLE VUE ZOOLOGICAL GARDENS, MANCHESTER  
on  
SATURDAY AND SUNDAY 23rd 24th OCTOBER 1976  
FURTHER DETAILS SHORTLY

## Junior Aquarist

# BOAS & PYTHONS IN CAPTIVITY (2)

by John Coborn

### Some of the Species Usually Available

It is now intended to list a few of the species which are usually readily available from dealers, and to give brief notes on their individual requirements. The two sub-families will be treated separately.

#### BOINAE

##### Boa Constrictor (*Constrictor constrictor*)

Description: Probably the best known of the boas, the Boa Constrictor is often given the misleading title of the world's largest snake whereas, in fact, it ranks only sixth in the list of 'giants'. The maximum known length is only about 14 feet and some of its relatives can reach twice this length. The average adult size is 9-10 feet. The colours of this snake are particularly beautiful, being a subtle blending of chocolate, fawn and cream.

Distribution: Mexico, Central and South America as far South as Northern Argentina.

Captivity: One of the more popular species, they are usually obtained as 2 foot youngsters. They are fairly easy to keep and will feed on mice. Larger specimens are fond of guinea pigs and chickens.

##### Anaconda (*Eunectes Murinus*)

Description: The Anaconda is possibly the world's heaviest snake although not the longest; first place going to the Reticulated Python. Specimens with a length of 25 feet and a diameter of 2 feet 6 inches have been recorded. This snake is semi-aquatic, spending much of its time laying in the waters of its native lands, feeding mainly upon water fowl and mammals such as capybara, but also catching the occasional fish or caiman. The colour is olive brown or green with large black spots. The underside is yellowish.



Boa Constrictor

Distribution: The rain forests of Northern South America. A smaller, closely related species (*Eunectes notaeus*), is found further South, as far as Paraguay and Argentina.

Captivity: Not the easiest of snakes to acclimatise to captivity, they often steadfastly refuse to feed for long periods. With patience, however, once it can be persuaded to feed, it will do well and grow rapidly. This species appreciates a deep water dish, into which it can submerge itself completely. In the author's experience, Anacondas prefer birds as their basic diet in captivity; young specimens can be fed on chicks and as they grow they will take larger chickens and ducks. A 16 feet specimen in the reptile house at the Cotswold Wild Life Park, will eat up to three large chickens or ducks per week. Occasionally, this snake will fast for several weeks and then suddenly start feeding again quite normally.

##### Rainbow Boa (*Epicrates cenchris*)

Description: This beautiful little boa is the one most highly recommended as a household pet. Its light brown skin marked with dark rings shows a remarkable iridescence when seen in a certain light; something similar to oil floating on the surface of water. It is one of the smaller boas, rarely reaching five feet in length. In the wild, it spends much of its time in the trees as it is an excellent climber, having a prehensile tail.

Distribution: Central and South America from Panama to the North of Argentina.

Captivity: Definitely one of the easiest of the boas to keep, this snake will feed well on almost any small mammal or bird. It will soon become extremely docile if handled frequently and rarely does it attempt to bite. It loves to spend long periods soaking itself

in water and so a large dish should be provided. This species often breeds in captivity and produces living young, which are easy to raise on very small mice.

#### **Rubber Boa (*Charina bottae*)**

**Description:** This small boa rarely reaches more than two feet in length. It gets its common name from its strange rubbery appearance. In colour, it is a uniform silvery grey, with a tinge of green. It is a typical burrowing snake with a blunt head and an extremely short tail. When threatened, the Rubber Boa will roll itself into a ball with its head in the centre and leave its blunt tail outside the coils. This is a defensive attitude in which the tail mimics the head of a normal striking snake. In this way the boa leaves the least vulnerable part of its body exposed. It prefers humid conditions and is mainly found in damp pine forests.

**Distribution:** Western North America from Central California to the extreme South of Canada.

**Captivity:** An interesting little inmate for the vivarium, it should be provided with a three inch layer of peat and dead leaves as a floor covering into which it can burrow. This material should be sprayed lightly twice per week, taking care not to over-saturate. It will live quite happily on a diet of mice.

#### **Rosy Boa (*Lichanura roseofusca*)**

**Description:** Another small boa, this species may reach three feet in length. Its ground colour is yellowish, marked with reddish brown. The underside is a rosy pink, from which it gets its name. Unlike the rubber boa, this species is found mainly in dry, semi-desert areas.

**Distribution:** California and Mexico.

**Captivity:** This snake should be housed in a dry, sandy vivarium with a few rocks under which it will hide. It is semi-nocturnal and will be most active during the evening, when it may be fed on small rodents.

#### **Emerald Tree Boa (*Boa conina*)**

This is one of the most beautiful snakes in the family. They are totally arboreal, and have a unique method of draping themselves over branches by forming a perfect coil with the head at the centre and equal amounts of body on either side of the branch. The adults are a deep emerald green, punctuated by white or cream markings along the dorsal ridge. The underside is yellow. They are not large snakes, adults reaching a maximum of seven feet. In the wild, they are said to live mainly on bats and birds, and are endowed with extremely long, backward pointing teeth for catching such prey. They young are brick red in colour.

**Distribution:** The forests of the Amazon Basin.

**Captivity:** This is definitely not a snake for the beginner, being both expensive and difficult to keep. It should be provided with a tall vivarium containing stout branches, a peat floor covering and a dish of water. Humidity should be kept high by daily spraying and the temperature should not drop below 75°F, even at night time. It prefers birds as its basic diet and may be fed on sparrows and day-old chicks.

#### **Brown Sand Boa (*Eryx johnii*)**

**Description:** This is one of the few species of old world boas. It is a uniform dull brown in colour and has a blunt head and tail. It burrows efficiently through the sandy earth, hunting for lizards and small rodents which it constricts in the usual manner. It reaches three feet in length.

**Distribution:** The Indian Sub-Continent.

**Captivity:** This species requires a good six inches of dry sand into which it can burrow, and a temperature of 75-85°F. It may be fed on mice.

### **PYTHONINAE**

#### **Reticulated Python (*Python reticulatus*)**

**Description:** This is the longest of all the giant snakes and authentic records of specimens over 25 feet in length exist. It seems quite possible that this species can reach 33 feet as many reports of lengths of over 30 feet have been recorded, although the necessary proof is usually lacking in such cases. In spite of its great length, it is a slender snake, compared to the anaconda; specimens with a maximum diameter of over 18 inches being rare. The ground colour of this python is a chestnut brown, broken by a network of yellow scales and whitish blotches. It is equally at home on the ground, in water and in the trees as it can swim and climb most efficiently. In the wild it feeds mainly on mammals up to the size of small deer.

**Distribution:** South East Asia, from Burma to Indo-China, Malaysia and the Philippines.

**Captivity:** Young specimens from 3-6 feet are commonly available and make excellent pets. The only drawback is that in 2-3 years they reach such a great size, that they can almost eat one out of house and home. They should be handled frequently in order to keep them docile, as they can be savage and will strike viciously at their owner. They require a large water dish in which to bathe, and a stout branch. They may be fed upon rats, guinea pigs, rabbits and chickens.

#### **Indian Python (*Python molurus*)**

**Description:** This is another large species, examples of over 20 feet being quite common. It is more heavily built than the preceding species and may



Indian Python

have a large girth. There are two sub-species; often known as the dark phase and the light phase, the former being dark olive brown broken by yellowish lines and the latter being a light tan marked with off white lines.

Distribution: Light phase (*P. molurus molurus*)—India and Ceylon. Dark phase (*P. molurus bivittatus*)—Burma, Indo-China, Malaysia and the East Indies.

Captivity: The Indian Python makes an excellent pet as it soon becomes tame and easy to handle. This is the species most often used by snake dancers. Young specimens of 2-4 feet are often available and may be fed on mice, rats and chicks. They also require a stout branch and a large water bath.

#### African Python (*Python sebae*)

Description: In colouring the African Python is similar to the preceding species but the pattern is different. This species may also reach over 20 feet in length but is a slimmer snake than the Indian Python.

Distribution: Almost the whole of Africa, South of the Sahara.

Captivity: As described for the Indian Python.

#### Royal Python (*Python regius*)

Description: This small snake is sometimes known as the Ball Python from its habit of rolling itself into an almost perfect sphere when threatened. The maximum length is about 5 feet. The markings of this species are particularly interesting, the chocolate brown ground colour being marked with yellow bordered, beige blotches.

Distribution: Equatorial West Africa.

Captivity: An extremely docile snake, the Royal Python rarely bites. It likes a high humidity and a large water bath. Initially, this species is often difficult to feed as it refuses all which is offered. One method of persuading it to feed, is to place a freshly killed mouse right in front of its mouth every evening until it takes it. This may take a couple of weeks but as soon as the snake has tasted its first mouse, it should begin to feed regularly.

#### Carpet Python (*Morelia argus*)

Description: The Carpet Python is a slender snake which may reach 10-14 feet in length. It is chocolate brown with small yellow blotches.

Distribution: Australia and New Guinea.

Captivity: This is an expensive species, but normally does well in captivity, feeding upon mice, rats and chicks.

#### A DATE FOR YOUR DIARY

THE FEDERATION OF SCOTTISH AQUARIST SOCIETIES

present

### THE 4th SCOTTISH AQUARISTS' FESTIVAL

at the CIVIC CENTRE, MOTHERWELL near GLASGOW

on

SATURDAY AND SUNDAY - 27th, 28th MARCH, 1976

Full Details and Schedules from:- D. Fotheringham Esq.,

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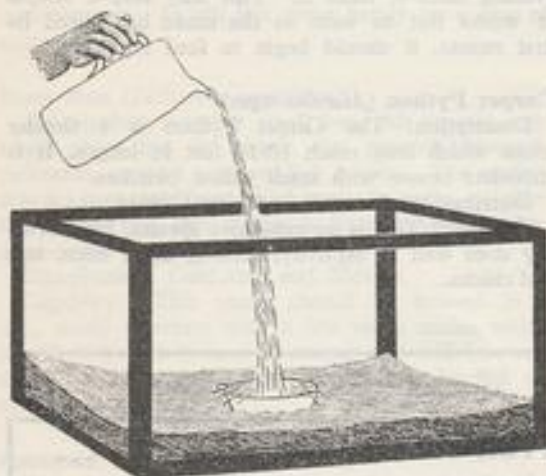


# BEGINNERS' CORNER

## (4) THE IMPORTANCE OF TEMPERATURE

by Bill Simms

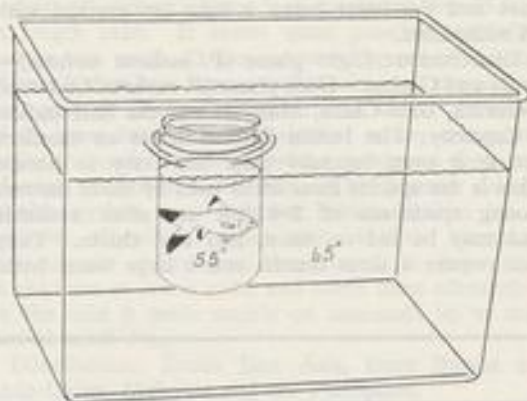
WHEN refilling a tank that has been half-emptied two things are important: the new water must be the same temperature as that already in the tank; and you must pour it in such a way that its entry does not disturb the sand or any sediment in its upper layers. Whether you syphon it in from a bucket placed above the level of the tank top, or pour it in from a jug, first place a saucer or shallow basin on the sand, centrally, and pour into that—even though the saucer is well below water level it will still prevent swirling and sand disturbance if you aim the stream correctly. Pour slowly.



New water for a cold tank should be drawn the night before use, and stood in a separate container alongside the aquarium overnight. By morning it will be the same temperature; but only if it is stood alongside—water that is just in the same room, perhaps stood on the floor, could be up to 10 degs. different. It is essential for all fish that they should never be subjected to a sudden change of temperature. Slow changes within their own range are all right, but a sudden change is bad because a fish takes its internal body temperature from the water it is in. This may mean that food already eaten could fail to

digest, and is one of the many possible upsets.

When transferring a fish from one tank to another, or from a pond to a tank, special precautions must be taken to slow down the temperature change. Place the fish in some of its present water in a jam jar, using only sufficient water for the jar to float in the new tank. Leave it floating there for about an hour, during which time the two water temperatures will equalise, after which the fish can be poured safely with its old water directly into the new. This applies to all fish, tropical as well as the cold water one illustrated here.



Preparing new water to replace a little that has been removed from a tropical aquarium is slightly different, for it has to be warmed up. If you are certain that your hot-water supply system is pure (some may be polluted with copper) mix hot and cold water until it is about 5 degs. F. warmer than that in the aquarium and test these two waters with the same thermometer (some vary quite a lot from others). Let this warmer water stand for a short time to release any chlorine and take up oxygen from the atmosphere, and when it has cooled to about 1 degree above the aquarium water, pour it in—very gently. Precautions such as these should ensure that none of your fishes ever have to tolerate sudden changes of temperature.



## 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.

AT the Catfish Association of Great Britain's annual general meeting held in November, the following committee members were re-elected for the next two years: Chairman, R. Goodson; Treasurer, Mrs. P. Lambourn; and Show Secretary, D. Lambourn. A new P.R.O. was elected, namely Miss P. Rogers. Anyone interested in attending the meetings would be welcome to come along any time between 8 p.m.-10.30 p.m., to St. Saviour's Church Hall, Cobbold Road, London, W.12. Meetings are held every two months, on the second Monday of that month (next meeting, 12th January, 1976).

IN the first meeting of the Lincoln A.S. in November there was a beginners' programme and this consisted of a film show on suitable fish for a beginner. The attendance was very good and the Table Show consisted of Tetras and Barbs. The winners were as follows: 1, Mrs. Evans; 2, Mr. Calam; 3, Master Pearce; 4, Master Spittlehouse.

The second meeting in November was devoted to the annual general meeting and the committee and officers elected are: President, Mrs. B. Sellars; Chairman, J. Woodliffe; Treasurer, H. Stanham; Secretary, Mrs. S. Woodliffe, 36 Richmond Road, Lincoln LN1 1LQ, tel. 32790; News Editor, K. Towse; Publicity Officer, D. Stamer. Forming the rest of the committee are Mr. Fletcher, Mr. Pister, Mr. Driver and Mr. and Mrs. Calam.

THE November meeting of the Mid-Sussex A.S. was as usual the largest meeting of the year and, also, the final Fish Show for the year for the members. The table show was judged by Mr. J. Stillwell, Vice-President of Mid-Sussex, who awarded the following cards: Characins: 1 and 4, B. Sayers, Brighton; 2, Mr. Kirkstead, Tonbridge; 3, S. Duffell, Crawley and Horsham; Labyrinth: 1 and 2, M. Sparshott, Mid-Sussex; 3 and 4, T. Ramshaw, Brighton. Corydoras: 1, K. Farnell, Tonbridge; 2, K. Groves, Crawley and Horsham; 3, D. Anaconbe, Mid-Sussex; 4, T. Ramshaw, Brighton. Rasbora: 1, T. Ramshaw, Brighton; 2 and 3, B. Slade, Mid-Sussex; 4, S. Feast, Tonbridge. Danio and W.C.M.M.: 1 and 2, I. Bellingham, Tonbridge; 3, P. Berry, Mid-Sussex; 4, P. Owsley, Crawley and Horsham. A.O.S. Livebearers: 1 and 2, C. Thorpe, Reigate and Redhill; 3, D. Perchard, Tonbridge; 4, T. Ramshaw, Brighton. The club's awards were as follows: 1, Tenbridge, 16 points; 2, Mid-Sussex, 16 points; 3, Brighton, 14 points; 4, Reigate and Redhill, 7 points; 5, Crawley and Horsham, 6 points. Information concerning the club may be obtained from the Secretary, Mr. B. Slade, "Sandown", Bolsey Road, Anstye. Phone: H. Heath 53747.

THERE was a record entry of 834 for the annual open show of the Newbury and District A.S. held in September. The highest pointed visiting club was Kingston, and the Best Fish in Show Trophy went to W. A. Knight of Gosport, with a Rift Valley Cichlid. Results of the thirty-seven classes were as follows: Furnished Aquaria: 1, Mrs. G. Rushbrook, Reading; 2, J. Jupp, Gosport; 3, R. J. Hard, Haslemere. Barbs: 1, M. West, Kingston; 2, R. F. Adams, Salisbury; 3, A. Chaplin, Basingstoke; 4, R. Canning, Newbury. Barbs other than Class Ba: 1, M. Carter, Southampton;

2, T. Burrill, Basingstoke; 3, M. Dore, Reading; 4, L. Yates, Petersfield. H.H. & C.: 1, R. Onslow, Basingstoke; 2, I. J. Lecky, Basingstoke; 3, J. Jackson, Basingstoke; 4, T. Woolley, C.A.G.B. W. & P.: 1, C. Turner, Cardiff; 2, J. A. Pollard, Kingston; 3, M. Strange, Basingstoke; 4, P. Rushbrook, Reading. A.O.S. Characins: 1 and 3, M. West, Kingston; 2, A. Weaire, Southampton; 4, A. C. Tull, Salisbury. Angels: 1, R. Canning, Newbury; 2, Mrs. Newbury, Gosport; 3, E. & T. Tester, Mid-Sussex; 4, K. B. Conolly, Gosport. A.P. & N.: 1, Mrs. Newbury, Gosport; 2, 3 and 4, M. Carter, Southampton. Rift Valley Cichlids: 1 and 3, A. Knight, Gosport; 2, K. B. Conolly, Gosport; 4, Mr. and Mrs. R. Houghton, Mid-Sussex. A.O.S. Cichlids: 1, D. J. Turner, Gosport; 2, R. Canning, Newbury; 3, R. F. Adams, Salisbury; 4, A. F. Gibson, Reading. Fighters: 1, M. Carter, Southampton; 2 and 4, C. & J. Richards, Sudbury; 3, B. Young, Newbury. A.O.S. Labyrinth: 1, P. Brown, Southampton; 2, Mrs. V. J. Lloyd, Independent; 3, A. Chaplin, Basingstoke; 4, R. Canning, Newbury. Killies: 1, R. Canning, Newbury; 2, P. Brown, Southampton; 3, C. & J. Richards, Sudbury; 4, D. J. Jackson, Salisbury. Tropical Catfish: 1, D. Sheridan, Newbury; 2, P. Farnell, Tonbridge; 3, C. Turner, Cardiff; 4, W. Onslow, Kingston. Corydoras and Brechis: 1, M. Carter, Southampton; 2, Mrs. K. Clarke, Gosport; 3, E. Farnell, Tonbridge; 4, P. Rushbrook, Reading. Rasbora: 1, C. & J. Richards, Sudbury; 2, P. Timmins, Gloucester; 3, T. Woolley, C.A.G.B.; 4, C. Turner, Cardiff. Danios and White Cloud Mountain Minnows: 1, M. Strange, Basingstoke; 2, R. Onslow, Basingstoke; 3, S. Bartlett, Sudbury; 4, Mrs. Newbury, Gosport. Loaches: 1, C. Turner, Cardiff; 2, A. C. Tull, Salisbury; 3, J. A. Pollard, Kingston; 4, K. Hillier, Newbury. Labors: 1, K. B. Conolly, Gosport; 2 and 3, D. B. Perchard, Tonbridge; 4, P. Timmins, Gloucester. Egglayers other than Class Ma: 1, Mrs. V. J. Lloyd, Independent; 2 and 4, Mrs. E. Dibley, Newbury; 3, C. Turner, Cardiff. Class N.R.M. Pairs (Tropical Egglayers): 1, C. & J. Richards, Sudbury; 2, Mrs. E. Dibley, Newbury; 3, A. Weaire, Southampton; 4, J. Ellis, Kingston. Pairs (Tropical Livebearers): 1, B. H. Pankhurst, Bracknell; 2, D. Kenwood, Naitles; 3, R. Canning, Newbury; 4, T. Woolley, C.A.G.B. Male Guppy: 1 and 2, A. Noronha, Orpington; 3, D. J. Turner, Gosport; 4, C. & J. Richards, Sudbury. Female Guppy: 1, C. & J. Richards, Sudbury; 2, M. J. Myers, Newbury; 3, J. Randall, Haslemere; 4, T. Woolley, C.A.G.B. Swordtails: 1, T. Burrill, Basingstoke; 2, R. Scaplehorn, Newbury; 3, I. Pierce, High Wycombe; 4, A. Noronha, Orpington. Plania: 1, R. Onslow, Basingstoke; 2, J. Randall, Haslemere; 3, A. Noronha, Orpington; 4, P. Timmins, Gloucester. Mollies: 1, E. & J. Tester, Mid-Sussex; 2, J. Jackson, Basingstoke; 3, R. F. Adams, Salisbury; 4, T. Woolley, C.A.G.B. A.O.S. Livebearers: 1, A. Noronha, Orpington; 2, M. Carter, Southampton; 3, J. Randall, Haslemere; 4, M. Strange, Basingstoke. Breeders (Egglayers): 1, C. Turner, Cardiff; 2, K. B. Conolly, Gosport; 3 and 4, A. Noronha, Orpington. Breeders (Livebearers): 1, C. Turner, Cardiff; 2, M. Bishop, Bishops Cleeve; 3, I. Pierce, High Wycombe; 4, Mr. and Mrs. E. Lough, Kingston. Breeders

(Goldwater): 1 and 3, T. Longstaff, Kingston; 2, T. Woolley, C.A.G.B.; 4, Debbie and Darren Langford, Jnr., Haslemere. Common Goldfish: 1, P. Pinder, Independent; 2 and 4, J. Randall, Haslemere; 3, D. J. Mackay, Kingston. Shubunkins: 1, D. J. Mackay, Kingston; 2, P. Pinder, Independent; 3, R. Hard, Haslemere. Twintailed Goldfish: 1, T. Longstaff, Kingston; 2, 3 and 4, I. A. Pollard, Kingston. A.O.S. Goldwater: 1, J. Jupp, Gosport; 2, J. Randall, Haslemere; 3, T. Longstaff, Kingston; 4, B. West, Kingston. Marlines: 1 and 2, M. J. Illick, Naitles. Plants: 1, J. Ellis, Kingston; 2, J. Jackson, Basingstoke; 3, C. G. McKay, Sudbury; 4, J. A. Young, Independent.

THE Doncaster A.S. open show held in October was a huge success with 926 entries. The results were as follows: Guppies: 1, Mr. and Mrs. Bunn (Scunthorpe Museum); 2, Mr. and Mrs. Blenkin (Bridlington); 3, Mr. Lowe (Halifax). Plania: 1, Mr. and Mrs. Robson (Eboracum); 2, Mr. and Mrs. Bradshaw (Sheaf Valley); 3, Mr. and Mrs. Riley (Leeds G.P.O.). Swordtails: Mr. Smith (Horsforth); 2, S. Andrews (Hull); 3, Mr. and Mrs. Holmes (Independent). Mollies: Mr. and Mrs. Nickolson (Swillington); 2, Mr. and Mrs. Houghton (Southport); 3, Mr. Reeve (Eboracum). A.O.V. Livebearers: 1, A. Whiteley (Aireborough); 2, A. Orlove (Loughborough); 3, B. Jackson (Doncaster). Juniors Livebearers: 1, Master Green (Castleford); 2, Master A. Peasey (Doncaster); 3, M. & T. Holmes (Castleford). Juniors Egglayers: 1, Master J. Emerson (Castleford); 2, Master S. Neville (Grantham); 3, Master King (Doncaster). Small Barbs: 1 and 3, Mr. and Mrs. Emerson (Castleford); 2, Mr. and Mrs. Bradshaw (Sheaf Valley). Large Barbs: 1, Mr. and Mrs. Cohen (Doncaster); 2, Mr. and Mrs. Tyson (Hull); 3, Mr. and Mrs. Morgan (Castleford). Goldfish and Comets: 1, Master G. Steers (Scunthorpe and District); 2, Master G. Frisby (Hull); 3, Mr. Short (Sheaf Valley). Shubunkins and Fancy Goldfish: 1, Mr. and Mrs. Holmes (Independent); 2, Mr. Slight (Aireborough); 3, Mr. and Mrs. Hopkinson (Darfield). A.O.V. Goldwater: 1, Mr. and Mrs. Blades (Bassettlaw); 2, Mr. and Mrs. Sumner (Sheffield); 3, Mr. and Mrs. Kerry (Castleford). Dwarf Cichlids: 1 and 2, Mr. and Mrs. Chester (Retford); 3, Mr. and Mrs. Moorstein (Immingham). Angels: 1, Mr. and Mrs. Caldwell (Scunthorpe Museum); 2, Mr. and Mrs. Hislop (Swillington); 3, N. Andrews (Hull). A.O.V. Cichlids: 1 and 2, B. Crabtree (Sandgrounder); 3, Mr. and Mrs. Blades (Bassettlaw). Malawi Cichlids: 1 and 2, Mr. and Mrs. Scall (Goole); 3, T. Hope (Hudderspool). Breeders (Live 1-10): 1, D. & P. Birdall (Aireborough); 2, Mr. and Mrs. Baldwin (Sandgrounder); 3, Master S. White (Retford). Breeders (Live 11-20): 1, Mr. and Mrs. Feasey (Doncaster); 2, Mr. and Mrs. Richardson (Scarborough); 3, H. Thorpe (Doncaster). Breeders (Egg 1-20): 1 and 2, Mr. and Mrs. Sellars (Lincoln); 3, B. Jackson (Doncaster). Breeders (Egg 11-20): 1, I. Parkin (Keighley); 2, Mr. and Mrs. Scall (Goole); 3, Mr. and Mrs. Shipley (Goole). Small Characins: 1, D. Jackson (Independent); 2, Mr. and Mrs. Bradshaw (Sheaf Valley); 3, Mr. and Mrs. Newton (Blackburn). A.O.V. Characins: 1, A. Whiteley (Aireborough); 2, T. Tipwell (Grimsby and Cleethorpe); 3, Mr. and Mrs. Roberts (Doncaster). Aphemion: 1 and 3, A. Young (Hull); 2, G. White (Scunthorpe and District). A.O.V. Toothcarps: Mr. and Mrs. Beetz (Retford); 2, G. White (Scunthorpe and District); 3, Mr. and Mrs. Kennington (South Humberdale). Small Anabantids: 1, Mr. and Mrs. Emmerson (Castleford); 2, Mr. and Mrs. Tyson (South

DISINFECT NEW PLANTS AND FISH WITH  Hillside Aquatics London N12



**Humberston:** 3, Mr. Clouston (Immingham).  
**A.O.V. Ambleton:** 1, Mr. and Mrs. Newton (Blackburn); 2, J. and G. Waterhouse (Sandgrounder); 3, Mr. and Mrs. Caldwell (Scunthorpe Museum). **Fighters True-Colour:** 1, Mr. and Mrs. Chester (Retford); 2, D. & M. Laycock (Sheaf Valley); 3, Master J. Emerson (Castleford). **Fighters Multi-Colour:** 1, P. Blades (Scunthorpe and District); 2, Mr. and Mrs. Muckle (Sandgrounder); 3, Mr. and Mrs. Riley (Leeds G.P.O.). **Corydoras:** 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mrs. Holmes (Castleford); 3, Mr. and Mrs. Baldwin (Sandgrounder). **A.O.V. Catfish:** 1, Mr. Rooney (Stockton); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Garrick (Scarborough). **Loaches:** 1, Mr. and Mrs. Binns (Scunthorpe Museum); 2, Mr. and Mrs. Binns (Scunthorpe Museum); 3, Mr. H. Thorpe (Doncaster). **Plants:** 1 and 2, T. Kilvington (Doncaster); 3, Mr. and Mrs. Roberts (Doncaster). **Furnished Jars:** 1, Mr. and Mrs. Chester (Retford); 2, A. Taylor (Mexborough); 3, Stansill & Ramsey (Castleford). **Ladies:** 1 and 3, Miss L. Blizard (Sheffield); 2, Mrs. Baldwin (Sandgrounder). **Egglayers:** 1, Mrs. Sellers (Lincoln); 2, Mrs. Emerson (Castleford); 3, Mrs. Riley (Leeds G.P.O.). **Sharks and Foxes:** 1, Mr. and Mrs. Baldwin (Sandgrounder); 2, Mr. and Mrs. Houghton (Southport); 3, Mr. and Mrs. Beaumont (Pontefract). **Danios:** 1, Master S. White (Retford); 2, A. Onslow (Leoughborough); 3, Mr. and Mrs. Burton (Blackburn). **Rasbora:** 1, Mr. and Mrs. Copley (Doncaster); 2, Master S. White (Retford); 3, Mr. and Mrs. Garrick (Scarborough). **Minnows:** 1, S. Bostock (Leoughborough); 2, Mr. and Mrs. Robson (Eboracum); 3, Mr. and Mrs. Binns (Scunthorpe Museum). **Pairs Livebearers:** 1, Mr. and Mrs. Robson (Eboracum); 2, Mr. and Mrs. Blenkins (Bridlington); 3, B. & D. Birdall (Aireborough). **Pairs Egglayers:** Mr. and Mrs. Stanton (Sheffield); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Holmes (Castleford). **Novice Livebearers:** 1, Mr. Barker (York); 2, Mr. Dark (Doncaster); 3, Mr. and Mrs. Tipwell (Grimsby and Cleethorpes). **Novice Egglayers:** 1 and 3, Mr. and Mrs. Bullman (Doncaster); 2, P. Easton (Deasne and District). **A.O.V. Tropical:** 1, G. White (Scunthorpe and District); 2, Mr. and Mrs. Baldwin (Sandgrounder); 3, Mr. Allen (South Humberston). **Society with most Points:** Castleford. **Best in Show, Aquarists Gold Pin Winner, also winner of the Garrison Lane Trophy and the Atkinson Rose Bowl:** G. Muckle (Sandgrounder).

**RECENT table show results of the Coventry Pool & Aquarium Society** were: A.V. Cichlid: 1, R. Cleaver; 2 and 4, B. & F. Hirst; 3, D. Lynch. A.V. Livebearer: 1, 2 and 3, B. & F. Hirst; 4, B. Hancock. A.O.V. Tropical: 1, B. & F. Hirst. A.V. Danio: 1, 2, 3 and 4, R. Cleaver. A.V. Killifish: 1, 2, 3 and 4, B. & F. Hirst.

**OFFICERS** elected at the annual general meeting of the **Reading & District A.S.** held in October were: Re-elected Chairman: A. Gibson, 27 Holydale Close, Reading (phone 85502). Secretary: G. G. Vockins, 10 Pembroke Place, Caversham RG4 0HW.

**OPEN Show** results of the **Vauxhall Motors** held in October were as follows: Class B: 1, Mr. and Mrs. Crew, Wellingborough; 2, Miss Yearwood; 3, B. King, Vauxhall; 4, J. Halley. Class B: 1, T. Woolley, Saracens; 2, P. Moye, Sudbury; 3, C. & J. Richards, Sudbury; 4, Mr. and Mrs. Crew, Welling-

borough. **Class C:** 1 and 2, Mr. Brazier, Sudbury; 3, A. Worth, Dunstable; 4, P. Moye, Sudbury. **Class C:** 1 and 2, Mr. Brazier, Sudbury; 3, S. Bartlett, Sudbury; 4, C. & J. Richards, Sudbury. **Class C:** 1, D. Luxton, Vauxhall; 2, P. Moye, Sudbury; 3, Mr. Brazier, Sudbury; 4, R. Sinfield, Vauxhall. **Class D:** 1 and 4, P. Butt, W.A.D.A.S.; 2, A. Worth, Dunstable; 3, J. Halley. **Class D:** 1, K. Usher, Doncaster; 2, W. Davidson, Vauxhall; 3, R. Marshall, N.A.D.A.S.; 4, J. Abbit, Dunstable. **Class D:** 1, Mr. and Mrs. Oakley, Dunstable; 2, S. Bartlett, Sudbury; 3, Mr. and Mrs. Tilley, Saracens; 4, Mr. Brazier, Sudbury. **Class D:** 1, P. Moye, Sudbury; 2, Mrs. A. Philip, Vauxhall; 3 and 4, B. Rumney, Vauxhall-mid-H. **Class E:** 1, R. Rowland, Dunmow; 2, B. Barford, Saracens; 3, A. Thacker, Vauxhall; 4, R. F. Thoday, Dunmow. **Class EA:** 1 and 4, A. Thacker, Vauxhall; 2, C. & J. Richards, Sudbury; 3, T. Woolley, Saracens; **Class F:** 1 and 4, Mr. and Mrs. Crew, W.A.D.A.S.; 2, C. & J. Richards; 3, R. F. Thoday, Dunmow. **Class G:** 1, R. F. Thoday, Dunmow; 2 and 3, P. Moye, Sudbury; 4, Mr. and Mrs. Tilley, Saracens. **Class H:** 1, 2, 3 and 4, P. Moye, Sudbury. **Class I:** 1, R. F. Thoday, Dunmow; 2, P. Moye, Sudbury; 3, A. Thacker, Vauxhall; 4, C. & J. Richards, Sudbury. **Class J:** 1, Mrs. S. Moore, H.H.A.S.; 2, A. Thacker, Vauxhall; 3, Miss Yearwood, H.H.A.S.; 4, A. E. Noronha, Orpington. **Class M:** 1, R. F. Thoday; 2, Mr. Brazier, Sudbury; 3, Mr. and Mrs. Crew, W.A.D.A.S.; 4, A. Thacker, Vauxhall. **Class N:** 1, C. & J. Richards, Sudbury; 2, P. Moye, Sudbury; H. J. Foxlee-Brown, Southampton; 4, A. Johnson, Kingsclere. **Class O:** 1 and 2, K. Usher, Doncaster; 3, J. Abbit, Dunstable; 4, T. Woolley, Saracens. **Class P:** 1, C. & J. Richards, Sudbury; 2, Mr. and Mrs. Cress; 4, A. E. Noronha, Orpington. **Class Q:** 1 and 4, H. J. Foxlee-Brown, Southampton; 2 and 3, T. Woolley, Saracens. **Class Q:** 1, K. Usher, Doncaster; 2, D. Luxton, Vauxhall; 3, B. Meech, Dunmow; 4, R. P. Thoday, Dunmow. **Class R:** 1, R. Onslow, Kingsclere; 2, A. E. Noronha; 3 and 4, M. Teale, Vauxhall. **Class S:** 1, P. Moye, Sudbury; 2 and 4, B. Manning, Southampton; 3, D. Luxton, Vauxhall. **Class T:** 1, 2 and 4, K. Usher, Doncaster; 3, A. E. Noronha, Orpington. **Class X:** 1 and 4, K. Usher, Doncaster; 2, P. Moye, Sudbury; 3, D. Luxton, Vauxhall. **Class X:** 1, P. Moye, Sudbury; 2, Mr. and Mrs. Crew, W.A.D.A.S. **Class Z:** 1, Mr. Brazier, Sudbury; 2, J. Halley; 3, J. C. Baines, Vauxhall; 4, A. Philip, Vauxhall. **Class Junior:** 1, P. Philip, Vauxhall; 2, Miss Church, H.H.A.S.; 3, R. Woolley, Saracens; 4, Helen Thacker.

**ON** the first weekend of November the **Huddersfield T.P.S.** held a unique double bill starting on the 1st November with an auction of fish, plants and equipment. There was attendance of well over one hundred people to what turned out to be a very successful auction, selling about £150.00 of goods.

Then on the 4th November an Open Evening was held when members of the public were invited to come and see demonstrations on tanks and how to make them, aeration, filtration, how to make an undergravel filter, general tank decor, fish foods and how to culture your own, and finally tank care and maintenance. This was organised and carried out by the members of the committee. The project was a great success, attracting some ninety people, who by the end of the evening it is hoped knew more about fish and fish keeping than they did previously. The tank was then raffled, and a delighted winner went home with a complete outfit.

The society would also like to thank Animal Magic, B. T. Foden, H.A. Tropicals, K. L. Gill and Outland Aquarist who kindly provided all the equipment that went into the tank and without them the evening would not have been possible.

**CHANGES** of officers in the **South Shields A.S.** are as follows: Chairman, B. Scott; Vice-Chairman, I. Ruffell; Secretary, M. Laydon, c/o 10 Morpeth Drive, Morpeth, Sunderland, Co. Durham; Assistant Secretary, Sanderson; Treasurer, R. Scott; Assistant Treasurer, Mrs. E. Ruffell; Show Secretary, B. Ribbridge; Assistant Show Secretary, R. Laydon; G. Wright; Librarian, C. Minchell; Social Secretary, Mrs. L. Scott; Assistant Social Secretary, Mrs. A. Turnbull.

**COMMITTEE** changes are reported from **Rhondda A.S.** The new secretary is B. Ashcroft, 9 Simon Street, Williamstown, Rhondda, and the treasurer is R. Richards, 3 Sherwood Street, Llanynnos, Rhondda. Thanks are expressed by the club to the retiring treasurer, A. Cryer, and also R. Richards for his work in his previous office as secretary, which he held for seven years.

**OFFICERS** elected at the annual general meeting of the **Hemel Hempstead A.S.** were as follows: Chairman, S. Collins; Vice-Chairman, R. Furneaux; Secretary, A. Bloice, 28 Barleycroft, Hemel Hempstead, Herts.; Assistant Secretary, Mrs. S. Moore; Treasurer, Miss K. Yeasdon; Show Secretary, Mrs. I. Collins; Assistant Show Secretary, D. Thomas; Stock Controller, A. Flowers; Press Officer, Mrs. C. Thomas; Social Secretary, Mrs. B. Church; Catering Officer, D. Church; Junior Representative, Miss H. Church. The meetings are held every other Thursday in the Friends Meeting House, Hemel Hempstead, at 7.45 p.m.

**RESULTS** of the **Hastings and S. Leonards A.S.** third open show held in September were as follows: **Class B:** 1 and 4, J. Bellingham, Tonbridge; 2, E. & T. Tester, Mid-Sussex; 3, A. I. Feast, Tonbridge. **Class B:** 1 and 2, J. Bellingham, Tonbridge; 3, Mrs. D. Cruickshank, Baling; 4, J. Bellingham, Tonbridge. **Class C:** 1 and 3, P. Cottle, N. Kent; 2, C. & J. Richards, Sudbury; 4, A. P. Constantine, Hounslow. **Class Ca:** 1, B. Nichols, Mid-Kent; 2, Mrs. P. Edwards, Thanet; 3, A. I. Feast, Tonbridge; 4, R. Onslow, Kingsclere. **Class C:** 1, A. E. Noronha, Orpington; 2, P. Cottle, N. Kent; 3, T. Thompson; 4, Mr. and Mrs. Rooney, Brighton. **Class D:** 1, B. Nichols, Mid-Kent; 2, A. E. Noronha, Orpington; 3, M. Netherell, Riverside; 4, R. G. Rice, Brighton. **Class D:** 1, W. A. Knight, Gosport; 2, Mrs. R. Houghton, Brighton; 4, B. Sayers, Brighton. **Class E:** 1 and 2, C. & J. Richards, Sudbury; 3, C. Finnis, Strood; 4, D. Durrent, Southend. **Class E:** 1, Mrs. Parrish, Hounslow; 2, C. Finnis, Strood; 3, D. S. Taylor, Riverside; 4, Mr. and Mrs. Pannell, Hastings. **Class F:** 1, A. P. Constantine, Hounslow; 2, B. Sayers, Brighton; 3, D. Raymond, Mid-Kent; 4, K. Usher, Doncaster. **Class G:** 1, M. Netherell, Riverside; 2, P. Farnell, Tonbridge; 3, T. Woolley; 4, B. Nichols, Mid-Kent. **Class H:** 1, M. Netherell, Riverside; 2, Mrs. D. Cruickshank, Baling; 3, P. Cottle, N. Kent. **Class I:** 1, Baling; 3, P. Cottle, N. Kent; 2, T. Woolley; 3, R. J. Hard, Hasslemere; 4, P. Cottle, N. Kent. **Class K:** 1, Mrs. I. Bellingham, Tonbridge; 2, R. Onslow, Kingsclere; 3, R. J. Hard, Hasslemere; 4, Mr. and Mrs. B. Fry, N. Kent. **Class L:** 1, B. T. Tester, Mid-Sussex; 2 and 3, C. McKay, Sudbury; 4, A. I. Feast, Tonbridge. **Class M:** 1 and 2, D. & B. Perchard, Tonbridge; 3, B. Nichols, Mid-Kent; 4, T. W. Ramshaw, Brighton. **Class N:** 1, T. Woolley; 2, C. & J. Richards, Sudbury; 3, Mrs. R. Houghton, Brighton; 4, C. & D. Saunders, Tonbridge. **Class O:** 1, 2 and 4, A. E. Noronha, Orpington; 3, M. Collins, Brighton. **Class P:** 1 and 3, T. Woolley; 2, C. & J. Richards, Sudbury; 4, C. Finnis, Strood. **Class Q:** 1, K. Usher, Doncaster; 2, Mrs. Miles, Sittingbourne; 3 and 4, A. E. Noronha, Orpington. **Class R:** 1, R. Onslow, Kingsclere; 2, A. E. Noronha, Orpington; 3, A. P. Constantine, Hounslow; 4, J. & S. Randall, Fernhurst. **Class S:** 1, T. Woolley; 2, M. Netherell, Riverside; 3, A. E. Cully, Hounslow; 4, E. T. Tester, Mid-Sussex. **Class T:** 1 and 4, A. E. Noronha, Orpington; 2 and 3, K. Usher, Doncaster.

**holamid** A TABLET A DAY, SENDS WHITE SPOT AWAY  
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Class U: 1, Sybil Hedges, Bethnal Green; 2, F. H. Hoppembrowers, Hounslow; 3 and 4, J. & S. Randall, Fernhurst. Class V, all fish disqualified. Class W: 1, Sybil Hedges, Bethnal Green; 2, R. Brett, N. Kent; 3, Mr. and Mrs. B. Fry, N. Kent; 4, K. Usher, Doncaster. Class Xbn: 1, R. W. Duroe, Orpington; 2 and 3, A. E. Noronha, Orpington; 4, T. Woolley. Class Xct: 1, 2 and 3, K. Usher, Doncaster; 4, A. E. Noronha, Orpington. Class Z: 1, Sybil Hedges, Bethnal Green; 2, G. Cottle, N. Kent; 3, T. Woolley; Joint 4, C. & J. Richards, Sudbury, A. P. Constantine, Hounslow.

The show was a great success with 512 fish benched. Master G. Cottle, member of N. Kent A.S., was awarded the Adams Tropical Imports Shield for highest pointed Junior.

AT the November meeting of Retford & District A.S. the resignations of Mr. and Mrs. K. Clarke as secretary and committee members were accepted and they were thanked by Mr. D. Gilding for the work they had done for the society. The main part of the evening was taken up by a very interesting talk and exhibition by Mr. B. Fisher of Workshop on dealing with electricity when installing aquariums in the home. The monthly table show results were as follows: Corydoras: 1, Mr. and Mrs. B. Chester; 2, Mr. and Mrs. R. Vernon; 3, Mr. and Mrs. D. Vallance. A.O.V. Catfish: 1, Mr. and Mrs. B. Chester; 2, Mr. and Mrs. J. Brett; 3, Mr. and Mrs. J. Barnett. Sharks and Poses: 1, Mr. and Mrs. J. Brett; 2, Mr. and Mrs. A. Marsh; 3, Mr. and Mrs. B. Cowgill. Juniors: 1, Master S. White; 2, A. & J. Scott; 3, Master G. Mayson.

A TABLE show was the main item at the Brighton & Southern A.S. November meeting, and the results were: Ladies Cup: 1, 2 and 3, Mrs. R. Houghton; 4, Mrs. S. Corbin. Breeders (egg-layers) Xbh: 1 and 2, H. Sayers; 3, Mr. and Mrs. R. Houghton; 4, T. Ramshaw. Livebearers Xct: 1, R. Cannon; 2, M. Collins; 3, T. Ramshaw; 4, B. Sayers.

AT the annual general meeting of the Stroud & District A.S. held early in November officers for the coming year were elected, and the President, Mr. G. Tindell, thanked members for making last year a success. The officers are now as follows: Chairman, R. Amor; Vice-Chairman, G. King; Secretary, D. Cole; Treasurer, T. Artus; Show Secretary, D. Cole; Committee, C. Hodges, A. Macgarrig, P. Davis; Junior Committee, S. Amor; P.R.O., C. Whittaker, Stroud 5817. The evening show was for angels and platies. Winners: R. Amor, D. Furnis, I. Whalley, C. Whittaker.

OFFICERS elected at the Yate & District A.S. annual general meeting which was held in November are as follows: Chairman, R. Hyett; Vice-Chairman and Programme Officer, D. Noble; Secretaries, Mr. and Mrs. D. Reed, 18 Widcombe, Yate, Bristol, Avon; Treasurer, R. Poots; Editor, A. Small; P.R.O., R. A. Bennett; Committee Members, C. Suckland, R. Bishop, S. Broomgrove.

COMMITTEE changes reported from Wellingborough & District A.S. are: Chairman, A. J. Tupman; Vice-Chairman, D. Tobin; Treasurer, T. Young; Secretary, Mrs. M. Crew, 67 Swinburne Road, Wellingborough; Show Secretary, A. Crew; Editor, G. Walker.

IN November members of the Amersham & District A.S. held their annual members' open show. This year's prizes were donated by the makers of aquarium tropical fish food, and Mr. A. Rollason, a club member, and were presented by Mrs. J. Barfield, secretary of the Amersham Community Centre. The winners were as follows: Barb: 1, E. P. Gates; 2, O. Mawers. Characins: 1 and 2, A. Rollason. Cichlids: 1, A. Rollason; 2, R. Harper; 3, P. Daniels. Labyrinths: 1, Mrs. M. Daniels; 2, J. Goulding. Tropical Catfish: 1, Miss L. Titard; 2, R. Steppoe; 3, P. Daniels. Danios-W.C.M.M. Rasboras: 1, A. Rollason; 2, P. Guze; 3, T. Hearn. Loaches and Botas: 1, Master P. Guze; 2, K. North. Tropical Egg-layer: 1, K. North.

Guppies: 1, Master S. Descombe; 2, A. Rollason; 3, P. Guze. A.V. Livebearer: 1, Master T. Hearn; 2, S. Descombe. A.V. Breeders Class (4 Fish): 1, S. Thompson; 2, R. Harper. A.V. Coldwater Fish: 1, Master P. Daniels; 2, Mrs. M. Daniels. Furnished Show Jar Competition: 1 and 2, S. Thompson.

THE Taunton & District A.S. at their October meeting heard a talk by Mr. Langdon of Yeovil on the keeping and breeding of coldwater fish. The table show was judged by Mr. New and there were seven classes, the results being: Sexed Pairs Livebearers: 1, 2 and 4, Carol Vellacott; 3, S. Pincombe. Sexed Pairs (Egg-layers): 1, R. Hagley; 2, Carol Vellacott; 3 and 4, M. Bray. Dwarf Cichlids: 1, M. Bray. Large Cichlids: 1, D. Curry; 2 and 3, M. Bray; 4, C. Homer. Angel Fish: 1 and 3, Carol Vellacott; 2, R. Hagley; 4, C. Pincombe. A.O.V. Tropical: 1, D. Curry; 2 and 3, M. Bray; 4, R. Hagley. Lake Malawi Cichlids: 1, M. Bray; 2, D. Fleetwood. Trophies were presented to D. Curry for Best Fish in Show, C. Pincombe for Best Junior entry, and R. Hagley for Best Pair of Egg-layers.

THE recent monthly meeting of the New Forest A.S. took the form of a general discussion on many and varied subjects. One member asked if a cure was known for too many snails in his aquarium, and many members felt that good quality swordtails had disappeared from pet shops in the south. Table Show results: Barbs: 1, R. Travers; 2 and 3, M. Aust. Details of membership of the society may be obtained from the secretary, R. Travers, 6 Auckland Avenue, Beckenham, Hants. SO4 7RS.

AT their annual general meeting Barry A.S. elected the following officers to serve on the committee for 1975-1976: Chairman, A. Wallace; Secretary, C. J. Webber, 30 Portkerry Road, Rhoose, Glam.; Show Secretary, M. C. Guthrie; Treasurer, Mrs. B. Steer; P.R.O. and F.B.A.S. Delegate, M. Guthrie; C.N.A.A. Delegate, Mrs. Y. Guthrie; Technical Assistant, G. Parker.

OFFICIALS elected at the annual general meeting of the Spalding & District A.C. which was held in November were: Chairman, M. Barnes; Vice-Chairman, P. Springett; Treasurer, Mrs. Barnes; Secretary, Mrs. Figgott (10 Austendyke Road, Weston Hills, Spalding 4114); Show Secretary, D. Gerni. Committee members, M. Thompson and I. Oernall. Club meetings are held on the first Thursday of every month at 7.30 p.m. in Yulney Church Hall. Next meeting 8th January. Visitors and new members always welcome.

AFTER their annual general meeting Barry A.S. are hoping to reform and restructure the club along new and up-to-date lines, to keep pace with the changing facets of the hobby. Any past members, new aquarists, who wish to make contact, and senior citizens always welcome. If your interests are tropical fish, coldwater fish, marine fish and all other aspects of the hobby, please contact Mr. M. C. Guthrie, His Leath, 4 Nurston Close, Rhoose, Glam. CF6 9EF, for further details.

THE fourth annual table show of the White-way and District F.S. held in November proved very successful. The results were as follows: Guppy: 1 and 2, R. Harvey; 3, S. Daniels. Swordtail: 1, S. Daniels; 2, Master D. Sullivan. Platy: 1, Master D. Sullivan; 2, Miss T. Sullivan; 3, S. Daniels. Molly: 1, Master N. Pothecary; 2, Master D. Sullivan. Specified Barb: 1, Master A. Bradley; 2, D. Bradley; 3 and 4, Master A. Davis. A.O.V. Barb: D. Calley. H. and H. Characin: 1, R. Harvey. A.O.V. Characin: 1, D. Calley; 2, D. Bradley; 3, R. Harvey. Siamese Fighter: 1 and 2, G. Todd. A.O.V. Anabantid: 1, R. Harvey. Corydoras and Brochis: 1 and 3, Miss T. Sullivan; 2, S. Daniels; 4, Mrs. H. Bradley. A.O.V. Catfish: 1, S. Daniels; 2, Miss T. Sullivan. Botia, Loach, Eel and Shark: 1, S. Daniels; 2, Master D. Sullivan; 3, D.

Calley. Rasboras, Danio and Minnow: 1 and 2, Master A. Davis; 3, S. Daniels. A.V. Cichlid (excluding Angelfish): 1, C. Pawley; 2 and 3, D. Bradley. Angel: 1, D. Bradley. Shubunkin: 1, 2, 3 and 4, G. Jennings. Single Tail Goldfish: 1, 2 and 3, S. Daniels. Twin Tail Goldfish: 1, 2 and 4, G. Jennings; 3, S. Daniels. A.O.V. Tropical: 1, Master A. Bradley; 2, Miss T. Sullivan; 3, S. Daniels; 4, Master D. Sullivan. Junior Class any fish: 1, Master K. Daniels; 2, Master D. Calley; 3, Master A. Pawley; 4, Miss T. Sullivan. Furnished Jar: 1, Miss K. Fielding. Awards of plaques were given for the following: Best Tropical in Show: C. Pawley. Best Coldwater in Show: G. Jennings. Best Junior Exhibit in Show: Master K. Daniels. Junior with highest number of points through the year: Master D. Sullivan, for the second year running.

RESULTS of Hartlepool A.S. open show: Pairs (Egg-layers): 1, Mr. and Mrs. Lamb (Redcar); 2, J. Taylor (Half Moon); 3, Mr. and Mrs. Walker (Castleford). Pairs (Livebearer): 1, N. Blenkin (Billingham); 2, Mr. and Mrs. Jackson (Redcar); 3, Mr. Duddley (Hartlepool). Breeders (Egg-layers): 1, D. Goodall (Redcar); 2, K. Aulder (Hartlepool); 3, P. Wright (S. Shields). Breeders (Livebearer): 1, Mr. and Mrs. Richardson (Scarborough); 2, D. Turnbull (Bimby); 3, Mr. Duddley (Hartlepool). A.V. Guppy: 1, Mr. and Mrs. Shearer (Redcar); 2, N. Blenkin (Billingham); 3, L. Hall (Independent). A.V. Platy: 1, Mr. and Mrs. McCartney (Half Moon); 2, Mr. and Mrs. J. Riley (Leeds Post Office); 3, Mr. and Mrs. Lamb (Redcar). A.V. Molly: 1, Mr. and Mrs. Green (Castleford); 2, M. Stevens (Independent); 3, Mr. and Mrs. Duffell (Redcar). A.V. Swordtail: 1, Mrs. Toyne (Sheaf Valley); 2, Mr. and Mrs. J. Riley (Leeds Post Office); 3, D. Turnbull (Bimby). Dwarf Cichlids: 1, J. Urwin (Stanley); 2 and 3, N. Lynch (Stanley). Large Cichlids: 1, M. Moreland (Half Moon); 2, R. Atherton (Hartlepool); 3, S. Hay (Hartlepool). R.V. Cichlids: 1, R. Atherton (Hartlepool); 2, T. Hope (Hartlepool); 3, Mr. Duddley (Hartlepool). Angels: 1, J. Urwin (Stanley); 2, Mr. Richardson (Billingham); 3, S. Hay (Hartlepool). A.V. Fighter: 1, J. Emerson (Castleford); 2, Mr. and Mrs. J. Riley (Leeds Post Office); 3, Mr. and Mrs. Wood (Stockton). H.L.T.C.: 1, A. Howgate (Bimby); 2, Mr. and Mrs. Binks (Half Moon); 3, J. Middlemast (Stanley). A.V. Labyrinth: 1, P. Wright (S. Shields); 2, M. Sneedon (Hartlepool); 3, M. Morgan (Castleford). A.V. Catfish: 1, Mr. and Mrs. Anderson (Billingham); 2, H. Garthwaite (Hartlepool); 3, Mr. and Mrs. Saunders (Stockton). A.V. Corydoras: 1, Mr. and Mrs. Binks (Half Moon); 2, D. Turnbull (Bimby); 3, A. Clark (Castleford). A.V. Rasboras: 1, T. Hege (Hartlepool); 2, Mr. and Mrs. Wright (S. Shields); 3, Mr. Willet (Half Moon). Small Characins: 1, Mr. Stansell (Castleford); 2, P. Robinson (Half Moon); 3, S. Cox (Zenith). Large Characins: 1, K. Alder (Hartlepool); 2, Mr. Long (Half Moon); 3, J. Taylor (Half Moon). Small Barb: 1, N. Lynch (Stanley); 2, Mr. and Mrs. Emerson (Castleford); 3, J. Page (Half Moon). Large Barb: 1, Mr. and Mrs. Binks (Half Moon); 2, C. Robinson (Stanley); 3, J. Page (Half Moon). A.V. Shark: 1, Mr. and Mrs. Lamb (Redcar); 2, Mr. and Mrs. Anderson (Billingham); 3, Mr. and Mrs. Wright (S. Shields). A.O.V.: 1, M. Moreland (Half Moon); 2, D. Turnbull (Bimby); 3, J. A. Whiteley (Aldbrough). A.V. Coldwater: 1, 2 and 3, Elliot & Forrester (Bishop Auckland). A.V. Loach: 1, Emerson (Castleford); 2, J. Urwin (Stanley); 3, A. Clark (Castleford). A.V. Female: 1, J. Emerson (Castleford); 2, Mr. and Mrs. Lamb (Redcar); 3, M. Noble (Redcar). Junie Class:

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1, S. Green (Hartlepool); 2, M. McCartney (Half Moon); 3, G. Maguire (Hartlepool). Half Moon and Castletford tied for the Best Society Award. Best Fish in Show was won by N. Lynch of Stanley A.S. with Shuberti barb.

AN informative and amusing talk was enjoyed by the members of the **Hastings and St Leonards A.S.** in October. This was given by Mr. W. A. Back, the consumer relation officer of the Southern Water Authority. In November a new publicity officer was elected as Mrs. G. Coleman had had to resign due to personal problems. Also one new committee member was required. Mrs. S. Tyler was elected publicity officer and the new committee member was Mr. H. Eastman. This was followed by a new style quiz thought up by Mr. Barry Funnell, using slides. He really kept his audience on their toes with the occasional "trick" question. Winners of the table show were Classes K and L: 1, 2 and 3, C. Pannell. Class Xbm: 1, 2 and 3, Mrs. A. Adams. Class J: 1 and 3, Mrs. A. Adams; 2, C. Pannell.

AN inter-table club show took place in November between **South Humberston A.S.** and **Immingham A.S.**, which resulted in a win for the former society. Results: Guppies 1 and 2, Mr. and Mrs. Greenwood (I.); 3, Mrs. Kirk (S.H.). Mollies: 1, Mr. and Mrs. Lake (S.H.); 2 and 3, Mr. and Mrs. Grant (S.H.). Platies: 1 and 2, Mr. and Mrs. Clayton (I.); 3, Mr. Newson (S.H.). Swordtails: 1 and 2, Mr. and Mrs. Grant (S.H.). A.O.V. Livebearers: 1, Mr. and Mrs. Lake (S.H.); 2, Mr. and Mrs. C. Grant (S.H.); 3, G. Allen (S.H.). Large Characins: 1, P. Watts (S.H.); 2, Mr. Clayton (I.); 3, Mrs. Edwards (S.H.). Corydoras Cats: 1 and 2, Mr. Lake (S.H.). Small Arabantids: 1 and 2, Mr. and Mrs. Lake (S.H.); 3, Master M. Lake (S.H.). Angels: 1, Mr. and Mrs. Davenport (S.H.); 2, Mr. Newson (S.H.). Small Barbs: 1 and 2, Mr. and Mrs. Lake (S.H.); 3, F. Watts (S.H.). Small Characins: 1, D. Hill (S.H.); 2, Mr. Lake (S.H.); 3, Mr. Clayton (I.). Large Arabantids: 1, Mr. Clayton (I.); 2, Mr. Clarke (I.); 3, Mr. and Mrs. Davenport (S.H.). Damio Rasboras and Minnows: 1, Mr. and Mrs. Lake (S.H.); 2, Mr. P. Watts (S.H.); 3, Mr. Gosling (I.). Large Cichlids: 1, Mr. Kershaw (I.); Small Cichlids: 1, Mr. Lake (S.H.); 2, Master D. Jordan (S.H.); 3, Glen Allen (S.H.). Killies: 1, 2 and 3, Mr. Greenwood (I.). Sharks and Foxes: 1, Mr. and Mrs. Gosling (I.); 2, Mr. Clayton (I.); 3, Mr. N. Kershaw (S.H.). A.O.V.

Tropical: 1, Mr. Clarke (I.); 2 and 3, Mr. Kershaw (S.H.). Best Fish in the Show went to Mr. and Mrs. Gosling of Immingham. The over-all winners were South Humberston 67 points, Immingham 36 points.

OFFICERS appointed at the annual general meeting of the **Banff & District A.S.** were as follows: President/Secretary, J. M. Davidson, Innisville, Gardiner's Brae, Banff, 2836; Vice-President/Show Secretary, Mrs. Reid, Redhythe, Portsoy 343; Treasurer, D. Galloway; Management Committee, C. B. R. Davidson, J. McHattie, G. Hendry, W. Cowie, G. Reid, Porsay. Meetings are held on Friday in club room behind Banff Primary School at 7.30 p.m. every four weeks. Set-up aquaria in club premises for members' use. All interested please contact secretary at above address.

OPEN Show results of the **Northampton & District A.S.**, which were held in November are as follows: Class Ba: 1, Mr. and Mrs. Crewe, Wellingborough; 2, Mr. Wing, Evesham; 3, V. Hill, Northampton. Class Bz: 1, G. H. Tyson, S. Humberston; 2, Mr. and Mrs. Crewe, Wellingborough; 3, Mrs. D. Cruickshank, Ealing. Class Ca: 1, P. Moy, Sudbury; 2, Mrs. Revitt, Northampton; 3, L. J. Brazier, Sudbury. Class Cb: 1 and 3, L. J. Brazier, Sudbury; 2, P. Moy, Sudbury. Class Cc: 1, W. & S. Banbury; 2, Mrs. Pilbury, Northampton; 3, Mrs. Drage, Northampton. Class Dc: 1, W. & S. Banbury; 2, Mr. Usher, Doncaster; 3, P. Huckle, Harlow. Class Dd: 1, G. Sale, Aylesbury; 2, Mr. and Mrs. Chamberlain, Leamington; 3, W. & S. Banbury. Class De: 1, Mr. Whiddett, Northampton; 2, Mr. Wilkin, Aylesbury; 3, C. Chamberlain, Leamington. Class Dz: 1, N. Coleman, Wellingborough; 2, Mr. Hart, Northampton; 3, Mrs. M. Netherall, Riverside. Class Ea: 1, Mr. Thacker, Vauxhall; 2, N. Coleman, Wellingborough; 3, Mr. Goddard, Sudbury. Class Eb: 1, K. Paine, N. Works; 2, Mr. and Mrs. Chamberlain, Leamington; 3, Mr. Thacker, Vauxhall. Class F: 1, S.M.L.N., Nunston; 2, Mr. Crighton, Corby; 3, Mr. and Mrs. Crew, Wellingborough. Class G: 1, Mrs. M. Netherall, Riverside; 2, P. & L. Hill, Aylesbury; 3, D. Cowan, Aylesbury. Class H: 1 and 2, P. Moy, Sudbury; 3, W. & S. Banbury. Class J: 1 and 2, S.M.L.N., Nunston; 3, Mr. Thacker, Vauxhall. Class K: 1, P. Moy, Sudbury; 2, Mr. and Mrs. Chamberlain, Leamington; 3, C. Blackman, Aylesbury. Class L: 1, S.M.L.N., Nunston; 2, Mrs. D. Cruickshank, Ealing; 3, M. Brainbridge, Jones & Shipman. Class Na: 1, Mr. and Mrs. Crewe, Wellingborough; 2, M. Durdan, Northampton. Class Nb: 1, L. J. Brazier, Sudbury; 2, T. Cruickshank, Ealing; 3, Mr. and Mrs. Crew, Wellingborough. Class Nc: 1, T. Cruickshank, Ealing; 2, R. & D. Mahoney, T.K.A.G. 3, A. Robinson, Northampton. Class Nd: 1 and 2, Mr. Usher, Doncaster; 3, S.M.L.N., Nunston. Class O: 1, Mr. and Mrs. Crew, Wellingborough; 2, P. & L. Hill, Aylesbury; 3, L. A. Humphreys, Corby. Class Q: 1 and 2, Mr. Tyson, Humberston; 3, Mr. Usher, Doncaster. Class R: 1, K. Paine, N. Works; 2 and 3, W. & S. Banbury. Class T: 1, 2 and 3, Mr. Usher, Doncaster. Class U: 1, Mr. and Mrs. J. E. Amos, Bristol; 2, Mr. and Mrs. Crew, Wellingborough. Class V: 1, Mr. and Mrs. Amos, Bristol; 2, G. & M. Class W: 1, Mr. and Mrs. Crew, Wellingborough; 2, Mr. and Mrs. Amos, Bristol; 3, S. Andrews, Jones & Shipman. Class Xbm: 1, L. A. Humphreys, Corby; 2, P. Moy, Sudbury; 3, Mr. Ellis, Aylesbury. Class Xct: 1, 2 and 3, Mr. Usher, Doncaster. Class Z: 1, L. Brazier, Sudbury; 2 and 3, M. Shirley, Hazlemere. There were 513 entries.

OFFICERS elected at the annual general meeting of the **Northampton & District A.S.** were: Chairman, R. Memory; Vice-Chairman, Mrs. R. Pilbury; Secretary, Mrs. S. Taylor, 25 Rawley Crescent, New Dutton, Northampton NN5 6PU; Treasurer, D. Taylor; Show Secretary, J. Faor. Since then Mrs. Pilbury has resigned and R. Smith has taken over as Vice-Chairman.

Meetings are held on the first Tuesday of the month at the Golden Lion, Castle Street, at

7.30 p.m., and on the third Tuesday at the Fish Inn, Fish Street, at 7.30 p.m. Some of the forthcoming topics are: Jan. 6, Open Forum, Table Show Barbs; Jan. 20, Diseases and Problems; Feb. 4, Plants, Table Show, Characins; Feb. 18, Diplomas.

#### WANTED

The **Boston A.S.** would be pleased to hear from anyone who can offer the loan or hire of film shows or slide shows. Information please to the Secretary, Mr. K. Prendergast, 48 Robin Hood's Walk, Boston, Lincolnshire PE21 9ES.

**SECRETARY CHANGE OF ADDRESS**  
Yeovil and District A.S.: P. C. New, 43 Lyde Road, Yeovil, Somerset. Tel. Yeovil 24225.

#### VENUE CHANGES

**Yeovil and District A.S.** meetings now held on the first Wednesday of each month at the St. John Ambulance Brigade Hall, Yeovil, at 7.30 p.m.

As from the meeting to be held on Tuesday, 6th January, **Gloucester A.S.** meetings will be held on the first Tuesday of the month, at the Chequers Bridge Leisure Centre, Painswick Road, Gloucester, starting at 8.00 p.m.

Would aquarists please note that **Cardiff A.S.** will be changing the meeting place from February 1976. The new meeting place will be the Oddfellows Institute, Newport Road (opposite the Julian Hodge Building), Cardiff, and meetings will be held on the first Thursday of each month, the first meeting being 5th February.

#### NEW SOCIETY

The **Middlesbrough A.S.** has been formed recently and meet fortnightly in the Newport Settlement, Newport Road, Middlesbrough. Enquiries to Mr. G. Payne, 44 City Road, Grove Hill, Middlesbrough, would be welcomed.

#### SECRETARY CHANGES

**Rhondda A.S.:** B. Ashcroft, 9 Simon Street, Williamstown, Rhondda.

**South Shields A.S.:** Mrs. J. Laydon, c/o 10 Morpeth Drive, Moorside, Sunderland, Co. Durham.

**Boston A.S.:** K. Prendergast, 48 Robin Hood's Walk, Boston, Lincolnshire PE21 9ES.  
**Retford and District A.S.:** Mrs. B. Brett, 17 Gill Green Walk, Claborough, near Retford, Nottinghamshire.

**Yate and District A.S.:** Mr. and Mrs. D. Reed, 18 Widcombe, Yate, Bristol, Avon.  
**Gloucester A.S.:** K. Taylor, 69 St. John's Avenue, Churchdown, Gloucester. Tel.: Churchdown 719154.

#### AQUARIST CALENDAR

**15th February:** Sheaf Valley A.S. Third Open Show at the Sheffield Twist Drill Campton, Summerfield Street, Sheffield. Show Secretary, P. Stanforth, 47 Whitethorns Drive, Sheffield 8. Tel.: 662392.

**22nd February:** Retford and District A.S. Annual Open Show at the Market Hall, Town Hall, Market Square, Retford, Notts. Schedules from Show Secretary, B. D. Chester, 7 Rose Lea, Oadshill, Retford, Notts.

**10th April:** Cardiff Association of G.B. Annual Open Show at St. Saviour's Church Hall, Cobbold Road, London, W.12. Schedules and further details from Show Secretary, D. Lambourne, 7 Wheeler Court, Plough Road, London, S.W.11. Tel.: 01-223 2630.

**16th April:** Yate & District A.S. Open Show at King Edmunds School, Stanthawes Yate in Bristol. Schedules from Mr. C. Stickland, 20, Burgess Close, Chipping Sodbury nr. Bristol. (Schedules from 16th March).

**11th April:** Coventry Pool and Aquarium Society Open Show, Templars Junior School, The Hill Lane, Coventry. Large S.A.E. for schedule and entry form to Mr. T. Ilmma, 79 Edward Road, Coventry CV6 2QS.

**11th April:** Taunton A.S. annual open show.  
**24th April:** Chingford and District A.S. Open Show to commemorate 25th anniversary

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at St. Edmund's Church Hall, Chingford Mount Road, London, E.4. Schedules from Mrs. S. Harvey, 54 Kenilworth Avenue, Walthamstow, London, E.17. Available end of February.

**24th April:** Rhonda A.S. Open Show to be held at the Y.M.C.A., Perth, under F.B.A.S./C.N.A.A. rules. Postal entries 5p per entry. On day of show 10p. For further information please contact: Show secretary, A. Smith, 121, Glannant Street, Penygraig, Rhonda.

**25th April:** Reigate and Redhill A.S. Open Show at the Village Hall, Betchingley, Surrey. Further details later.

**25th April:** Yeovil and District A.S. Open Show at the School Hall, Marock, near Yeovil, Somerset.

**2nd May:** Medway A.S. Open Show at Medway and Maidstone College of Technology, Oakwood Park, Tunbridge Road, Maidstone, Kent. Schedules and details from Mr. C. A. Elliott, Beechwood, 72, Dargens Road, Walderslade, Chatham, Kent ME5 1BL.

**2nd May:** Ostram A.S.

**8th May:** Southend-Leigh and District A.S. Open Show, St. Clement's Hall, Leigh-on-Sea, Essex. Club and individual furnished aquaria,

aquascapes, marines, tropical, coldwater and junior classes included. Details from Show Secretary, D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea, Essex. Tel.: 0702 610576.

**9th May:** Bournemouth Annual Open Show to be held on Sunday at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show secretary, J. V. Jeffery, 30, Heremar Avenue, Southbourne, Bournemouth BH16 1JJF.

**16th May:** Gloucester A.S. Open Show. Stainless steel tankards for 1st, trophy for 2nd, and cash prizes for 1st in all classes. Schedules available in March from K. Taylor, 69 St. John's Avenue, Churchdown, Gloucester. S.A.E. please.

**22nd May:** Merthyr A.S. open show.

**23rd May:** Middleton and District A.S. Fifth Open Show to be held in the new Civic Hall, Middleton. Further details from Show Secretary, L. Dean, 24 Richmond Avenue, Chadderton, Oldham.

**30th May:** Corby and District A.S. Open Show. Sunday, at the Corby Civic Centre. F.B.A.S. rules. Details and schedules from the Show Secretary, C. McInnes, 18 Westminster Walk, Corby, Northants. Mid-March.

**3rd July:** Cardiff A.S. Open Show, St. Margaret's Church Hall, Roath, Cardiff. Details later.

**4th July:** Grantham and District A.S. seventh annual open show.

**18th July:** Provisional date for Sandgrounders Annual Show at Meols Cop School, Meols Cop Road, Southport. Further details when available from Hon. Show Secretary, G. A. Waterhouse, at 23 Moss Lane, Southport, Merseyside PR9 7QR, or phone Southport 24743, S. Hooton.

**23rd July:** South Humberide A.S. First Open Show, Memorial Hall, Cloethorpes. Schedules available from G. Wilson, 100 Guildford Street, Grimsby.

**15th August:** Stroud A.S. Open Show at the Subscription Rooms, Stroud. Show Secretary, J. Cole, 13 The Hill, Randwick, Stroud, Gloucestershire. Tel.: Stroud 4504.

**20th August:** The third Welsh National open show to be held at the Sophia Gardens Pavilion, Cardiff. Further details available from: C. Turner, 146 Arvan Street, Roath, Cardiff. Tel.: Cardiff 498982. M. Guthrie, 4 Nurston Close, Rhosse, Glamorgan. Tel.: Rhosse 710549.

**12th September:** Hatlow A.S. open show.



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