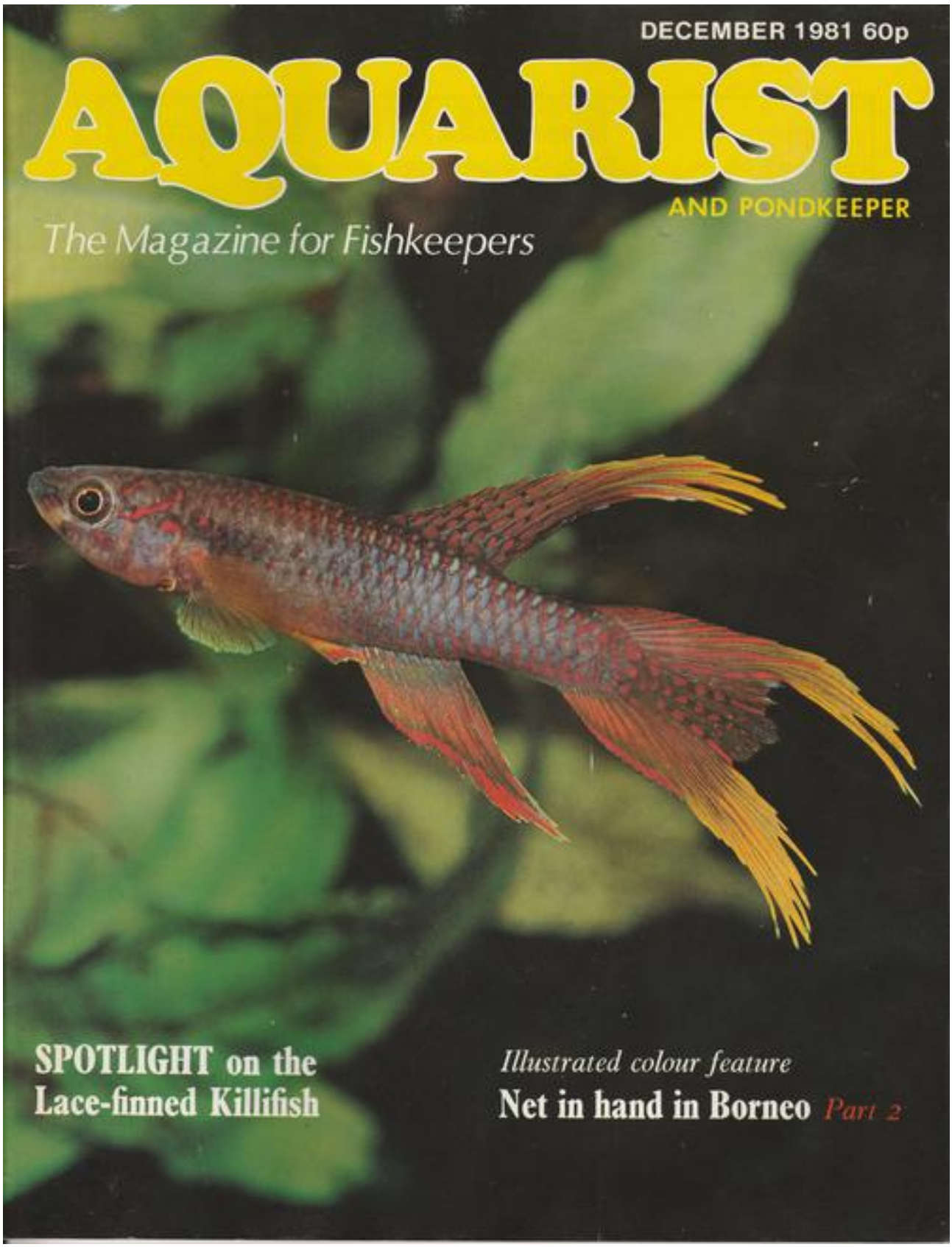
DECEMBER 1981 60p

AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



SPOTLIGHT on the Lace-finned Killifish

Illustrated colour feature

Net in hand in Borneo *Part 2*

THE AQUARIST AND PONDKEEPER

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JAVA FERN by B. Whiteside

PLANT PROFILE No. 4

FERNS ARE non-flowering plants, a number of which make good aquarium plants. The subject of this month's article is a member of the family Polypodiaceae—a family that contains ferns of very varying habit, with sporangia being produced on the lower surfaces of the leaves. The family includes common plants such as bracken and the maidenhair fern, but only two of the many species in the family are normally grown in decorative aquaria. Of these, the more popular is *Microsorium pteropus*, possibly better known as Java fern. This plant's proper name is not too difficult to pronounce: if you say MICRO-SAWR-E-UM TER-O-PUS you should get fairly close to it. Note that the first letter in the second name is not pronounced.

Java fern has a fairly tough, green rootstock that tends to creep along the surface on which the plant is growing. I have found that it grows well if one or two small strips of lead are used to hold the plant in position in the aquarium. For me it grows well if allowed to rest on the gravel, held in place by the lead; it will also grow at least as well if the weighted plant is placed on top of a rock; or placed just on the gravel touching a rock or stone. The point I wish to make is that Java fern does not need—or like—to be planted *in* the gravel; it will grow perfectly well and strongly on top of a rock, where many other plants would fail.

In my tanks this plant usually reaches a height of about 6-10 in. It produces new plantlets on the edges of mature leaves and when such plantlets begin to sprout near the top of a mature leaf the combination can add an extra few inches to the total height of a plant. As these small plantlets grow larger they can be removed and placed elsewhere; or they can be allowed to remain and grow where they are produced. If one does not separate clumps of this plant, beautiful thickets may be formed. At the moment I have one 24 in. tank that contains a beautiful forest of only *Microsorium pteropus*. I disturb the plant as little as possible and plants stretch from gravel and rock level to the water surface. When the tank becomes a little too crowded I carefully pluck out a few patches of young plants from the upper regions of older leaves and transfer the young plants to other tanks. I would recommend this as one of the few plants that I consider suitable for single-species-planting in a tank, i.e. a tank decorated with only Java fern, and no other plant. I find that this species does best in 10-12 in. deep tanks; it does not grow so well for me in deeper tanks—but perhaps others find that it grows well in their 15-18 in. deep tanks. Please drop me a line if such is the case.

Grows on rocks

Java fern produces trichomes (fine hairs) as well as much longer roots and after settling in firmly attaches itself to rocks with its brown roots. As it does not need gravel in which to root, the plant is ideal for special tanks where one wishes to exclude gravel. I have never allowed plants to grow emersed leaves but I believe that such leaves have three sections and that sporangia (a sporangium is a spore case that develops on some ferns; spores produced by ferns can develop into new plants—in a manner quite similar to the seeds of flowering plants developing into new, young plants) develop on the undersides of such leaves. A dealer once sold me a couple of plants that had three-lobed leaves; it was difficult to believe that they were Java fern, and that 'normal' underwater foliage would develop eventually.

Java fern is a most beautiful and useful plant that may be grown alone or with other species. It seems to like a reasonable amount of light—my plants grow very well in a 24 in. × 12 in. × 12 in. tank lit by two clear, tungsten, 40 watt bulbs for about six to eight hours daily; it also grows well in more shaded situations that receive somewhat less light, but it does seem to appreciate artificial light. It does not seem to be too particular about water conditions or temperature and tolerates quite a wide range. My plants seem to grow extremely well at 78-80°F, in water with a pH of 6-2, a carbonate hardness of 3-4°dH and a general hardness level of 8°dH.

Varying prices

I note that several advertisers in *The Aquarist* offer *Microsorium pteropus* at prices ranging from five for 50p, through 30p to 85p per plant; postage seems to be about 60p extra and at least one advertiser has a minimum order price. The advertiser offering the plant at 85p states that it is the true species. What constitutes 'a plant' is another matter. I could show a baby plant bearing only three leaves; or a larger clump, such as that in my photograph; or a large bunch growing from a rootstock of, say, at least 6 in. in length. See what your local dealer has to offer and at what price.

Java fern is a plant that I like very much. I find that it grows very well in a wide variety of conditions and produces really beautiful, green leaves in clumps. It reproduces quite easily once it has established itself and young plants produced on mature leaves can be moved to other tanks. It will root on rock surfaces, etc., and can grow well in a gravel-free tank. A tank housing only plants of Java fern can be most natural looking and appealing; but the plant should grow quite happily with numbers of other species. I consider *Microsorium pteropus* very good value at any of the prices I mentioned and can thoroughly recommend it to anyone who has not yet tried it. It's one of the most useful plants that I know of and I would certainly not be without it.

Please drop me a line if you try this species for the first time as a result of reading this short article.

The COELACANTH

Latimeria chalumnae

by S. Pritchard

FOSSIL RECORDS of the coelacanths have been found dating from 400 million years ago (Devonian period) to 70 million years ago (Eocene period) and then they disappeared (in fossil form), assumed extinct. These fossils show they were swimming around at the time when animal life began to invade the land from the waters, and with their limb-like fins they were probably one of the ancestral groups of the first land vertebrates. These ancient fishes were widely distributed across Europe, Africa and South America, most species living in fresh waters, but later ones were marine inhabitants. During a fishing trip in late December 1938, a trawler, fishing about 5 km South-West of East London (Cape Province, South Africa) at a depth of 40 fathoms, caught a large blue-grey fish just under 2 metres in length; this was to be "the greatest ichthyological discovery of the century."

Miss M. Courtenary-Latimer, the then curator of the East London Museum, brought the find to the attention of Professor J. L. B. Smith, a chemist and part-time Ichthyologist at Grahamstown University, who recognised the specimen as a "living fossil, the Coelacanth" which he named *Latimeria chalumnae*, after Miss Courtenary-Latimer. Unfortunately, before the specimen could be adequately preserved, the internal organs had decomposed, and was thrown away.

Professor Smith began the search for a second specimen. However, a well organised search and advertisement campaign, involving distribution of leaflets with pictures of *Latimeria* and offers of large rewards to the fishermen of the villages along the East coast of South Africa, revealed no specimens. After fourteen years, in 1952, a second coelacanth was caught off the coast of Anjouan island, one of the Comoro islands in the Indian Ocean, north of Madagascar, 1,000 miles from the point of capture of the 1938 specimen (which may have been a stray as it is now known that *Latimeria* are endemic to the Comoro islands).

This second specimen, also in a poor state of preservation, was different from the original specimen, having no first dorsal fin and the central lobe of the caudal fin missing. Professor Smith named this fish *Malania anjouanae* after the South African Prime Minister, Dr. D. F. Malan, who authorised the use of a military plane to collect the specimen from the Comoro islands. It now appears that this was an aberrant specimen and did not represent a new form.

To the fishermen of the Comoro Islands the coelacanth was no stranger although they did not fish for them often. This is because after spending hours landing one (coelacanth

will fight strongly until amost dead), the oily flesh is found to be quite unpalatable. In fact, the large rough scales are the only part of the fish used by the islanders (to rub inner tubes when mending punctures). However, since science is prepared to pay relatively high prices for good specimens, the islanders have gone out of their way to catch more.

While on location in the Comoro Islands during the making of the BBC series "Life on Earth," David Attenborough and the film crew were lucky enough to be present when a fisherman brought in a coelacanth which was still alive. They persuaded him to let it go in a shallow lagoon to enable them to film it in motion. Even though very near death, it could be seen that the pectoral fins could be used like limbs to enable the fish to "walk" over rocks if the water level fell and left it stranded.

Studies of the specimens caught in the past few years have brought to light some interesting facts about *Latimeria*.

The swim-bladder, unlike those of many fishes, is filled with fat and does not help in keeping the fish buoyant but instead the oily flesh and muscles assist in this process. The heart has a very simple structure; the skull is hinged in two parts; there are no vertebrate but a continuous cartilaginous rod. The blood has a very high concentration of urea, a waste product usually excreted by most other vertibrae. This level of urea would prove toxic to most other animals although high concentrations are also found in the blood of sharks and lungfishes. The amount of oxygen in the blood is such that if coelacanths were to move into warmer waters they would slowly suffocate; this is another reason why very few are caught alive and those that do only live a few hours.

Sexually mature females have been caught with mature eggs in the right ovary (the left appears to be non-functional). These eggs are very large—approximately 90 mm in diameter and weigh 320 grammes. Fossilized eggs have been found in deposits dated to 310 million years ago (Carboniferous period) and it was assumed the eggs were laid in a protected area on the sea bed and guarded by the parents, but it is now known that *Latimeria* is a live-bearer.

In 1962, a fifth specimen was caught and came into the possession of a French doctor living on Anjouan Island. He offered this specimen to Professor J. C. B. Smith who in turn offered it to the New York Natural History Museum. After complicated negotiations the Museum obtained its coelacanth and Professor Smith a shipment of medical supplies.

For thirteen years the fish lay in the Ichthyological Department of the Museum, available for study, but few Ichthyologists made use of it until Dr. C. S. Rand enquired whether he could obtain samples of hemopoietic tissue (blood forming tissue) from *Latimeria*. This would involve dissecting it. After permission had been given the dissection began. At first Dr. Lavett-Smith who was conducting the operation thought he had found some food fish inside the body cavity but on closer inspection it was a perfect replica of the adult, but with a yolk sac measuring approximately 30 cms long.

Therefore *Latimeria* eggs develop within the oviduct of the female, completely safe from any natural predator. Breeding season is believed to be between November and February due to the amount of sexually active fishes caught during this period.

The annual catch of coelacanth does not amount to more than five specimens, therefore it does not seem that over fishing is a threat to the species, but the need to protect this unique fish is fully realised and its safety is constantly under review.

Why has the coelacanth stayed in the same basic form for over 400 million years? Are its peculiar characteristics primitive or specialised? To which other group of fishes is the coelacanth most closely related? Why is the coelacanth limited to one small group of islands in the Indian Ocean?

Research in the future should answer these questions and countless more.

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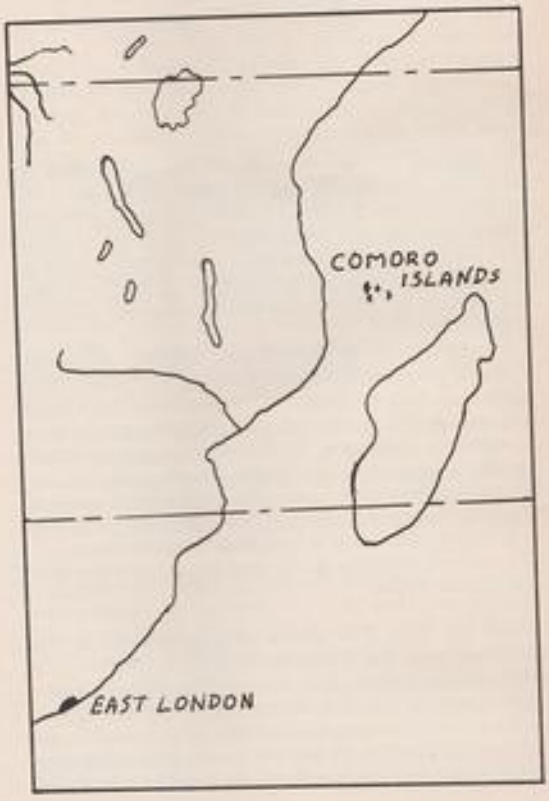
"The Living Coelacanth," Zoology Leaflet No. 10, British Museum (NH), 1975.
"A History of Fishes," by J. R. Norman and P. H. Greenwood.
"Life On Earth," by D. Attenborough.
"Latimeria—Babies are born, not hatched," by James W. Atz.



WHAT IS YOUR OPINION?

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

I SHOULD like to wish all my readers the compliments of the season for a relaxing and enjoyable Christmas. This is my last column in 1981 so I must take this opportunity to thank all those who wrote letters to me in 1981. I enjoyed reading them all—even those few that were critical—and regret that I was unable to publish all readers' letters that reached me. My thanks also to those who send me Christmas cards.

A summer visit to New Eltham where I visited an aquarium shop and a laboratory owned by Messrs Jerzy Gawor and Andrew Stagg. Both gentlemen are science graduates as well as aquarists and should feature in *Meet the Aquarist*. Readers of the liver fluke saga may remember that a letter from Mr. Gawor, knocking me, set the ball rolling about that topic. I'd like to thank Andrew and Jerzy for permitting me to take some photographs in their shop at the end of a very busy Saturday afternoon. As I said, you should be able to read an account of my visit in a separate feature.

The first letter I've selected for publication in this Christmas issue was written by Mr. M. G. Briscoe, of 1 Fields Court, Potters Bar, Herts. Mr. Briscoe writes: **"In answer to the comments regarding my information on Of-i-o-pogan—fountain plant—by Mr. B. Whiteside, I would further comment as follows: my early years in the horticultural trade were spent firstly** (*sic*) **at Thomas Rochford & Sons of Turnford and then at Stuart Low, Enfield, via the Oaklands College at St. Albans. I showed house plants at the Royal Horticultural Society exhibitions at Vincent Square where I won two bronze medals. This was in November 1958 and from that time I remained in the trade both running a retail business and carrying out landscape gardening. It can be seen that my experience was considerable on plants and I therefore feel that Mr. Whiteside was a little unjust in implying that I gained my knowledge from books.**

"As do many other people, I always check my information from a textbook when I will quote the relevant reference, author, etc., but on this occasion my knowledge comes from personal experience only."

I'm sorry, Mr. Briscoe, if you concluded that my comments in the August issue implied that you gained your **"knowledge from books."** I certainly did not intend to give that impression. Your reference to a book, together with your comment: **". . . The authoritative description continues as follows . . ."**, merely suggested to me that *some* of the *information* had come from a book. My Comment, **". . . . I wonder if some of his comments are quotations from a book . . ."** was made as a comment, in passing. Unfortunately someone put a question mark at the end of my comment and made it look like a question

I have the greatest respect for knowledge gained from practical experience, although I'm always happy to use, and to encourage others to use, reference books, e.g. dictionaries, to obtain or check information. (I think I would distinguish between information/facts, and knowledge). I have the highest regard for the Royal Horticultural Society and its standards; indeed, about 1964 I was awarded an R.H.S. Certificate after passing the Society's examination in general horticulture. My comments to the effect that one should acknowledge sources when quoting from books or articles were clearly directed at readers, in general. I'm a teacher by profession and tend to try not to miss any opportunity to teach others anything useful that they may not know. I hope that clarifies the misunderstanding, Mr. Briscoe, and I hope you'll write to this feature again in the future.

Before I leave the subject of horticulture I feel I must make a comment about a subject I mentioned several times in this feature quite some time ago. On those occasions I extolled the virtues of a weedkiller that was then fairly new to the amateur gardener. I had used it on a number of occasions and was very pleased with the results it produced. During the past two seasons I have observed some strange, stunted growth on numbers of rose bushes in my garden; and on a couple of other genera of plants belonging to the **Rosaceae** family. Last season I consulted a number of experts, none of whom was able to give me specific advice. Several weeks ago I consulted a top expert. His detective work again led me to wonder if the

stunted growth had any connection with the weedkiller. I sent the expert a whole affected bush to investigate. By chance, several days after I posted the rose bush to the expert, an article appeared in a trade journal (horticultural). The expert sent me a copy—and I was fascinated to read that some others had also been wondering if there was a connection between peculiar rose growth and the weedkiller in question. I could say quite a bit more but I don't wish to do so at present because I think that the experts will have more to say quite soon. I'll merely suggest that you take great care with all weedkillers. This year I did not use any weedkiller near soil in which roses, or members of the **Rosaceae** family, are growing. I'll leave you to draw your own conclusions at present. I'd be very pleased to hear from anyone on this topic—even though it is not directly connected with the aquarium world. (I mentioned the weedkiller first in the context of clearing ground of weeds prior to digging a pond. I also suggested planting specific roses in the vicinity of ponds).

In the August issue I wondered about the lower case letter 'f' which 16-years-old Master Lindsey Harrison has at the beginning of the first word in his address. He lives at 31 ffordd Brangwyn, Garden Village, Gorseinon, Swansea, SA4 2EB, and he says: **". . . Both the 'f's' in 'ffordd' are pronounced as the single 'f' in 'froth' . . ."** which still leaves me wondering if it should begin with a capital or lower case 'f'. Lindsey continues: **"In the August issue I mentioned my breeding pair of keyhole cichlids which had bred three times, with the eggs becoming milky white and not hatching. Now I know the reason why: both of my fish are females. I have heard that such is quite common in angelfish but I've never heard of it happening with other cichlids.**

"Soon after writing my last letter one of my thermostats stuck and I lost my female *Tilmatochromis temporalis*. **Has anyone out there got a spare 3 in. female? I have just read the letter from Master B. McFadyne in which he mentions his sharks. I have seen these fish spawn on several occasions in the tank of a friend. It seems that they cannot breed before they reach a length of 4 in., and if he raises his two he will probably find two males. The female labeos grow bigger than the males and spawning usually occurs soon after a large water change. The small, clear eggs are sprayed into the plants. P.S. Can you identify my plant?"** (Lindsey included a small sketch, in pencil, of an aquarium plant. Unfortunately it's sometimes impossible to identify plants even if one sees specimens in an aquarium. Specimens bearing flowers are necessary in many cases. Your small sketch suggests an *Aponogeton* hybrid; a youngish plant of *Crinum thaianum;* or *Barclaya longifolia*. I should think it's most probably an *Aponogeton*. B.W.)

Coldwater

Master John Boden is 15 years old and resides at 6 Clutha Road, Davenport, Stockport, Cheshire. He has been keeping fish for one-and-a-half years. John says:

". . . I started to keep fish after I had seen a friend's 24 in. tropical aquarium. After a few weeks' hard saving I took the plunge. I bought a couple of moors, minnows and fantails which I put into a plastic tank that I already had. In December, 1979, my dad bought me a 24 in. all-glass aquarium in which the coldwater fish were kept. I filter this tank by undergravel filter beds and find these keep the tank very clean. At this moment I have two golden orfe and a koi which I need to try to sell because they are getting too big for me to keep anymore. In the coldwater 24 in. × 12 in. × 12 in. tank I also have a Tetra Billi (?) filter which works well. All the fish are doing very well and the filters are run by a Rena 301 pump.

"In early 1980 I bought a small aquarium and put five medakas (*Oryzias latipes*) **into it; and more by luck than by planning they bred. About 50 survived and after giving some away, and some casualties, I have about 25 now which are doing quite well. In their first few weeks of life I fed the young on Tetramin Baby Food 'E'.**

"In the Easter holidays this year I set up my first tropical aquarium. It is only a small one, 18 in. × 12 in. × 12 in. It is filtered by an U/G filter connected to a Rena 301 pump. In it at the moment I have platies, two young silver angels, guppies, one catfish, tetras and a female dwarf gourami. Only the female dwarf gourami survives; the male died a few days ago. I have had my best plant growth in this tank, with some straight and twisted *Vallisneria* **growing very well indeed. I hope to set up a 36 in. tank at some stage, to try to keep either Malawi cichlids or discus, as the discus fascinates me; though this will not be for some time because I am rather short of money. As well as tropical and coldwater fish I have a terrapin that successfully survived the winter. In the tropical tank I use a combined heater/thermostat that keeps the temperature around 76°F.**

"In closing I must thank both my mum and dad for their financial help and for putting up with the mess and helping me when anything has gone wrong. Keep on with the good work in *W.Y.O.;* **and I like the new format of** *The Aquarist* **better than the old one."**

Photograph 1 shows an interesting selection of plants in one of my 18 in. × 10 in. × 10 in. tanks (see caption). Mr. Barry Hurst, of 37 The Willows, Hedworth Estate, Jarrow, Tyne and Wear, also likes plants. He wrote:

"I'm responding to your enquiry about your readers' success, or otherwise, with *Aponogeton* **species. Like what seems to be the majority of aquarists I have had little or no success with plants. My 36 in. × 15 in. × 12 in. community tank, holding mostly**

barbs and a few tetras, plus a few straggly pieces of *Cabomba* and *Bacopa*, was stripped down and set up again minus the U/G filter plates. I went down to my local shop, South Tyneside Aquatics, which is run by two very helpful and knowledgeable men, and acquired a pre-packed pack of quality aquatic 'bulbs', from Ceylon, consisting of three *Aponogeton crispus*, three *A. undulatus* and three *Nymphaea stellata*, with planting instructions, and all for less than £1·00. I believe that the plant expert of *The Aquarist*, Dr. Vivian De Thabrew, is involved with the company.

"Within a week the 'bulbs' were well established; and now, months later, one or two are trailing the surface of the tank with a luxurious growth. I have since bought a few more *Aponogeton* bulbs, taken out of my dealer's tanks, with the same success. I have only a 24 in. × 20 watt Gro-Lux tube on for between 6-10 hours a day, and whether it was the removal of the U/G filter, or the quality of the bulbs, I don't know. I can only say that I am very pleased with them and would recommend them to anyone having difficulty growing plants." (In a previous issue I mentioned Dr. De Thabrew's having given me a present of five *Aponogeton* 'bulbs'. The *Aponogeton* in the photograph is a purple-leaved one that the kind Doctor gave me; a green-leaved one of the same species flowered in my tank several weeks ago. B.W.)

Readers abroad

No. 476 Bonaccord 59, Peterborough, Ontario, Canada, is the home address of Mrs. Ruth Hillman—and it's always encouraging to learn that readers who live in other countries also enjoy reading *The Aquarist*. Mrs. Hillman says: "When in Britain recently I picked up some copies of your magazine and found it most informative. I wonder if my experiences with breeding white cloud mountain minnows would be useful—in answer to August's request. For breeding these fish I used a five-gallon glass tank with regular tap water—pH 7·4—at 68°F. The canopy was fitted with two incandescent bulbs, one of which I replaced with a dead bulb. In the darker half of the tank I placed enough water sprite (*Ceratopteris thalictroides*—Indian fern) to make a fairly dense patch, and introduced eight white clouds which had been conditioned on Tetra flake conditioning food, adult brine shrimps and ground beef heart. Eggs were deposited in the darkened greenery; and after a week some of these had hatched to produce minute fry, best seen with a magnifying glass. As I was concerned at the parents' desire to eat the remaining eggs, I removed the parents at this point and replaced the dead light bulb with a live one.

"The fry were fed on liquid food, pre-mixed with tank water, for the first ten days, until some of the fry were visible with the naked eye. Then, as there was a range of sizes of fry, I fed both Liquifry and newly-hatched brine shrimps. The water was filtered from the beginning with a plain sponge filter (Dirt Magnet) with a gentle stream of bubbles of air passing through. These filters I find excellent in all my breeding tanks.

Cryptocoryne, Aponogeton, Lilaeopsis, Hygrophila, Microsorium and *Hydrocotyle* species

"After a few weeks these fish began to develop a most attractive shine so that one could see why they were known as 'the poor man's neon'. The young fish grew very slowly indeed and were only three-quarters of an inch at four months. However, by this time they had full adult colouring and were able to take Tetra growth food, an occasional feed of ground heart and regular flake food rubbed between the fingers. The young fish are quite sensitive to water pressure changes and so very small water changes were made frequently and evaporated water was replaced daily. The temperature was kept between 65-68°F. When the temperature was raised above this the colour of the fish faded and the fish became lethargic. The fish would have probably been all right at a lower temperature but my room temperature prevented my experimenting in this direction. Mid-winter in Ontario discourages low house temperatures.

"I have been most impressed by the enormous list of shows at the end of *The Aquarist*. I am hoping to take in the Salisbury show in September on my way back to Canada. By comparison, we have only a few shows per year in Ontario and the northern U.S.

"Incidentally, I have found that my tanks with incandescent lighting have much richer plant growth than with Gro-Lux fluorescent light. I have not come across a hood adapted for both, which might be best. I look forward to buying at least one more issue of your excellent magazine before I leave."

B.K.K.S.

My thanks to the British Koi-Keepers' Society who regularly send me a copy of the latest issue of their Magazine. It's interesting to note that the Society celebrated its 11th anniversary in October. Congratulations on your Magazine—and your anniversary. I was pleased to receive issue number two of the East Dulwich Aquarist Society Magazine. I think its editor, Mr. Dave Winder, deserves a word of praise because he appears to write the magazine as well as edit and illustrate it. Society meetings are held on the 2nd and 4th Monday of the month at Dulwich Baths Reception Hall, Crystal Palace Road, London, SE22.

Mr. David Bird sent me the following letter from his home at 34 Waverley Road, Reading, Berks. **"In the August issue of *The Aquarist* you invited your readers' opinions on aquarium lighting and new equipment. My endeavours to improve the lighting controls to my tanks may be of interest. At the outset into this addictive hobby I have aimed to provide as natural conditions as possible. One area I disliked was lighting control. I started by using a conventional time switch. This had on/off increments of 15 minutes, allowing the length of artificial daylight to be adjusted. In my opinion this is unnatural: daylight never behaves as if it were turned on or off by a switch.**

"This led me to build a dawn/dusk simulator using a motor-driven cam timer and relays. It had three stages of switching the tank lights on or off, giving dawn, sunrise, daylight, sunset, dusk and night. The simulator worked well giving a regular repeated pattern of day and night every 24 hours. Two slight problems with that system were the fixed pattern of each day and the fixed duration for each stage. The first was only a problem in so much as I wanted two days in the week to be 'late days'; the second was because I also wanted longer hours of light during weekends. The programmable clock/timer IC TMS 1601 seemed to be able to provide me with all the facilities—and more. Needless to say I set off to build yet another lighting controller. The chip is a very versatile 24-hour, seven-day clock having a built-on electronic memory—more chips—which can store up to 224 switching times. It has four switch outputs, which is an improvement on my dawn/dusk simulator. To the non-technical the equivalent would be 32 time switches each having two ons and two offs per day, plus omission. Setting up all those would be some task; whereas I have only to enter the timing data via a small push-button key pad. I can read from the LED display all the stored on/off timings and adjust any one to plus or minus one minute. The display shows the time of day plus the day of the week and the state of each switch output.

What is this plant? Note baby plantlet on tip of adult leaf. (top right)

"As I only dabble in electronics and this was my first 'chip' project I am more than pleased with the results. It has taken me three months to construct and get working. The lights which are controlled by the above timer are as follows: Switch 1 controls two red and one clear 15 watt pigmy lamps; Switch 2 controls one orange and one clear 15 watt pigmy lamps; Switch 3 controls two white 25 watt and one clear 15 watt pigmy lamps; and Switch 4 controls two × 18 in. and one × 36 in. Gro-Lux fluorescent tubes.

"From the above details (and the enclosed programme sheet) I hope you will receive some idea of how effectively the lights are now controlled. From the programme sheet you will see a morning 'lights on' period which allows for inspection and feeding. Tuesdays and Fridays are 'late days' to allow late evening feeding. At weekends the daylight hours are stretched out so the fish are on display longer; the high spot mid-evening gives the tank a bright spell of short duration.

"The quest for perfection continues. I have just completed yet another 'electronic-fishy-project' addition to the timer. This is an automatic light dimmer connected to Switch 1 lights. This fades up the lights when Switch 1 turns on; and the reverse when switching off. I'm pleased with the effect and may add dimmers to the other circuits to get smoother transition of light levels. The next project I have in mind is to simulate sun ray beams using a slowly rotating disc with small windows to allow the beams to shine through. The problem here is the small space between the glass dust covers and the underside of the tank hood.

"In your column I have read letters regarding length of lamp life—or the lack of it. I have had very few failures and believe this is due to not moving the tank hood with the lamps on, and avoiding knocks. Gro-Lux fluorescent tubes have a makers' expected working life of only 2,000 hours; therefore using a ten hour day we should rep.ace every 200 days. I doubt if many of us do. A new tube does appear more blue when working alongside an old one. I have now started to date stamp all new tubes on installation.

"Plant growth has varied in my 48 in. tank: some plants have been reasonable while others have wasted away. I use a Floramat CO_2 diffusion unit and Tetra Florapride regularly. A recent addition was a lace plant that initially grew very fast, producing five large, green leaves. It then slowly went brown and died right back. It has now started to push out two new leaves which are growing nice and slowly. I hope they last.

Caves

"As a last point, may I pass on a tip for making aquarium caves? To form a natural-looking cave entrance I have used the bottom half of a square bottle. Around the top lip I have glued small rocks to hide any straight edges. Once installed the bottle is hidden and the rock entrance blends in with the tank decor." (Unfortunately I do not have space to reproduce Mr. Bird's diagram. What do you think of his ideas? B.W.)

As always, I do not necessarily agree with the views expressed by contributors to this feature and I do not accept responsibility for the views expressed. Please drop me a line, if Christmas activities leave you enough time. Please **PRINT** your name and address clearly on your letters. For a 1982 issue please send me your opinions on any of the following: (a) the plant, the leaves of which have three sections, shown in photograph 2 (note the baby plantlet growing on the tip of the adult leaf); (b) please send me details of your experiences of tube worms which are most interesting marine creatures; (c) the dwarf Egyptian mouthbrooder, *Haplochromis multicolor*; (d) different filter media/mediums; (e) breeding pencilfishes; (f) breeding large cichlids; (g) your favourite aquarium book; and (h) sources of water for use in aquaria. Happy Christmas! Goodbye until 1982.

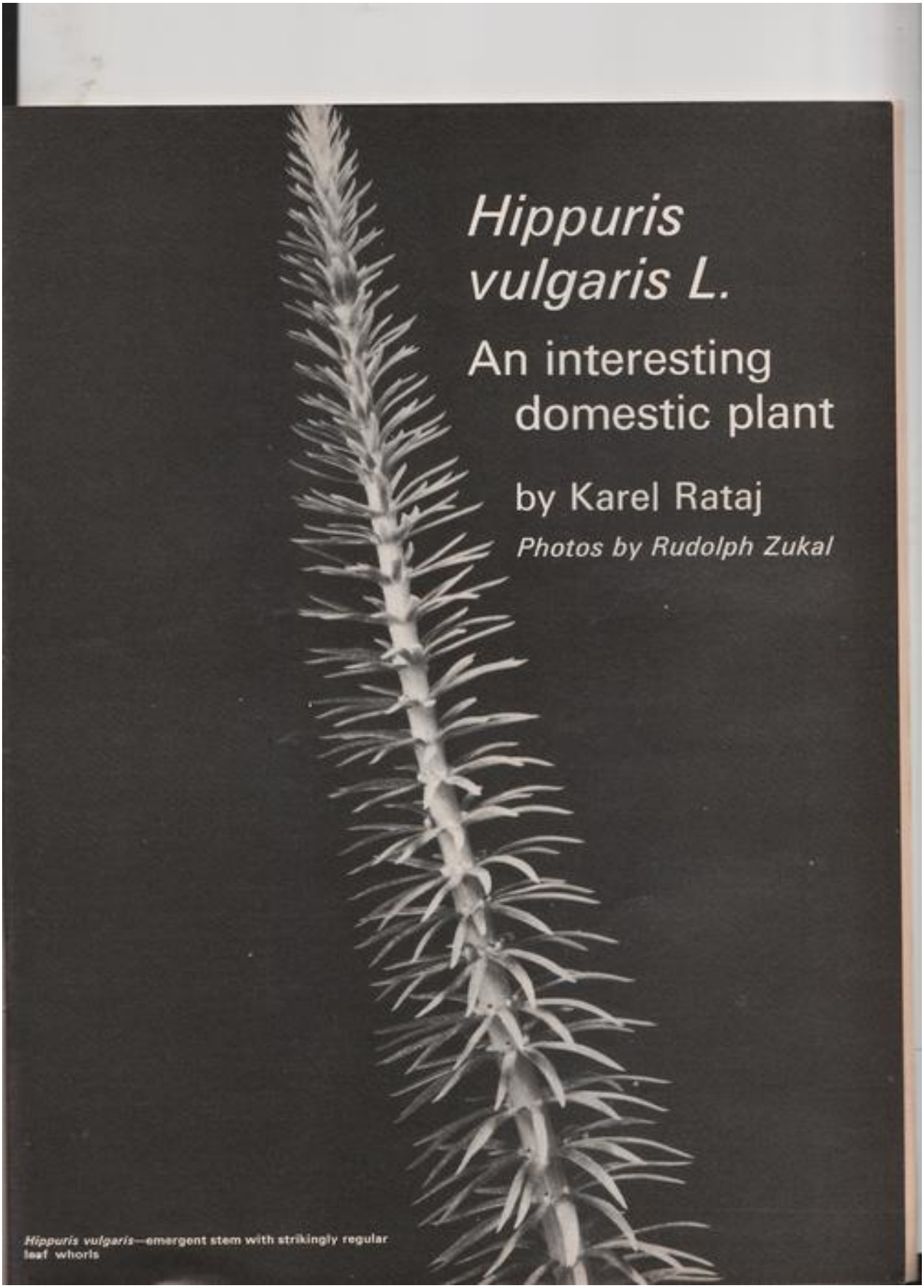
OSCAR **G. Robinson**

Hippuris vulgaris L.

An interesting domestic plant

by Karel Rataj

Photos by Rudolph Zukal



***Hippuris vulgaris*—emergent stem with strikingly regular leaf whorls**

Hippuris vulgaris is closely related to the species of Water Milfoil (*Myriophyllum*) known to all aquarists and used to be included with them in the family Halorhagaceae. Today the plant belongs to the family Hippuridaceae, which consists of the single genus *Hippuris*. It is not quite certain whether the two or three species described are only forms or varieties of a single species—*Hippuris vulgaris* L.

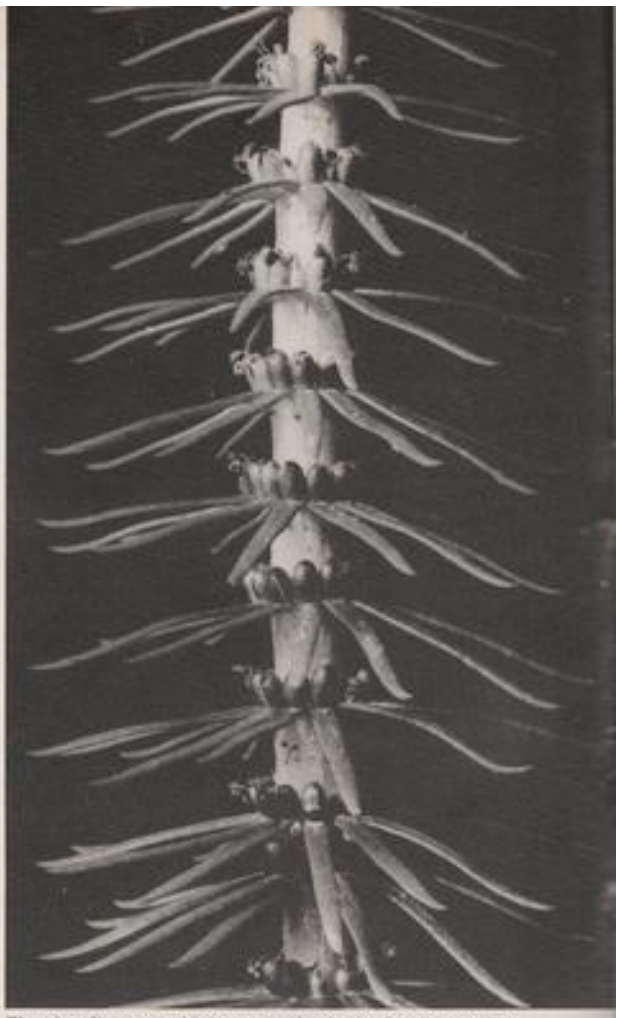
It appears throughout Europe, in the temperate and cool regions of Asia as far as Eastern China, Australia, in the temperate regions of Antarctic and northern America and in Greenland. It is an aquatic or amphibious marsh plant. The rootstock is large, branched and creeping. From this grow upright or tall-growing stems, which attain a height of 30–40 cm in emergent plants. Submerged plants in sufficiently deep water adapt to the depth of water and may be longer than 100 cm in exceptional cases. The stems are jointed, with the shorter limbs richly adorned with leaves which are arranged in whorls of six to fourteen. The leaves are elongated and entire. In emergent plants the leaves are shorter (1-2 cm long), broader, matt greyish-green and tough. In the case of submerged plants the leaves attain a length of 4-5 cm, with the result that the plant may be up to 10 cm in diameter. The leaves are soft, curving, bright green and usually elongated towards the tips where the plant is at its broadest.

Only emergent plants flower. The flowers are small, bud in the leaf axils and appear amongst the leaf whorls. The anthers or styles are stunted and so the flowers are unisexual.

Hippuris vulgaris grows in the wild state in still or gently moving clear waters of varying depths. It is also common along marshy watersides and ditches. It is found at different altitudes, from valleys up into the mountains.

In its permanently submerged form it is found in the wild state only in very deep waters (more than 50-60 cm). In shallower bankside waters it forms submerged, bright green stems bearing a wealth of foliage. This takes place from March to May at the onset of spring vegetation. When the submerged plants have reached a height at which their tips are about 5 cm beneath the surface of the water, they begin to adapt themselves to an emergent existence. After sufficiently long stems have developed which emerge from the water, the submerged parts lose their leaves and flowering begins.

In the natural state the plants come to life in the spring when the water has reached a temperature of 8-10°C Still waters are warmer than moving waters. Consequently the plants develop more quickly in the former. During the spring months plants from the wild are established in aquaria from March to May depending on conditions. Plants taken from still waters are preferable, in which the water temperature during their growth



The tiny flowers which are set in the leaf axils, are like corals

has risen throughout to 12-15°C. They take root more readily as the transition in the home aquarium having a temperature of 20-22°C is not as sudden as is the case when plants are taken from very cold, moving water. Submerged *Hippuris* grows exceptionally well in an aquarium which receives plenty of light and planted in a growing medium of sand enriched with minerals. In a tank which receives light from the sides the plant can be kept from spring to winter in its submerged form. In a tank which has a preponderance of overhead light, the plant often grows out of the water. It needs neutral, slightly acid to slightly alkaline, soft to medium-hard water. In winter the plants lose their leaf-bearing stems and the branched rootstock survives the winter in the aquarium only in rare cases. It is, therefore, a seasonal plant which will be valued only by hobbyists who like to have unconventional and interesting plants in the aquarium. In keeping such plants they are able to dis-

cover new and little-known characteristics involved in growing plants in artificial conditions.

Hippuris vulgaris is, in any case, an ideal decorative plant for smaller garden ponds and for the bankside vegetation of larger waters in gardens and parks. It is quite happy with a relatively shallow layer of mud or a mixture of sand and garden soil. During the months of spring the water is filled with richly leaved, submerged plants, which during the course of the summer form a thick growth of grey-green, emergent stems, which is reminiscent of a miniature forest of shave-grass. Using submerged plants such as these from garden ponds, one can brighten up the spring vegetation in the home aquarium.

Submerged plants have light-coloured leaves which are much longer than those of plants growing out of the water

A small garden pond decorated with emergent plants

SPOTLIGHT

Lace-finned killie

(Pterolebias zonatus)

By Jack Hems

From South America comes this member of the egg-laying division of the far-flung family *Cyprinodontidae*. It is popularly known as the lace-finned killie. The male can attain a length of about 6 in., the female about half this size. The species is essentially an inhabitant of the drainage ditches, inundated grasslands (seasonal swamps), shallow ponds, and the tributary streams of the Orinoco River system and the mighty Amazon north of Manaus.

The quality of the waters it inhabits ranges from peaty acid to alkaline. It is, however, known to tolerate brackish water without untoward results. In particular the tendency of these brackish, acid or alkaline (mildly) waters is to dry out completely between the months of October to April. Therefore, *P. zonatus* is, in a manner of speaking, one of those oddities of the underwater world: an annual fish.

I believe it is true to say that, annual fish were almost, if not quite, unknown to museum people and aquarium enthusiasts until about sixty years ago: and there is no question that it was the patient observations of early German fish collectors who travelled in the known and remote areas of Argentina and Brazil which brought them to the attention of the zoological and aquarium world. Moreover, it is also true to say that a great deal was discovered and written about the intriguing life-style and habits of short-lived or annual fishes (incidentally, many of them are native to equatorial and near equatorial parts of West and East Africa) between the two World Wars.

Doubtless a great deal more about

their astonishing lives and habits remains to be brought to light. Certainly it has been proved by meticulous breeders and keepers of these fishes that, the life-span of many of them can be extended beyond the accepted norm if they are maintained at a slightly lower temperature than the regular 75°F (24°C). There is something else besides: it is this: interrupting the conspicuous frequency and urgency of their spawning activities by separation of sexually aroused sexes quietens them down and conserves their energy and strength. (One can always bring them together again at a later date.)

The egg-depositing procedure of *P. zonatus* conforms with that of most other substrate spawners. According to a few paragraphs about this species in the loose-leaf edition of *Exotic Tropical Fishes* (TFH Publications, Inc. USA), the roe-filled female takes the lead in courtship. Put in other words she arouses the procreative instinct in the male (I suspect this is achieved by much fin-spreading and other forms of display including the donning of brighter colours). Then, having got the male interested, it follows that the couple retire out of sight, or partly out of sight, in the recommended 3-4 in. of peat moss. There they stow large (2 mm.) eggs. Spawning may continue over a period of several days. During this time the fish can be moved to other small (one or two-gallon) tanks set up (with regard to temperature and floor covering) to receive the eggs. It is of supreme importance to maintain a temperature in the middle to upper seventies (°F) while spawning is in progress. After spawning is over, the parent fish should be removed and the water lowered to tank-floor level. Most of the moisture that remains in the sodden peat is slowly evaporated into the atmosphere. An airing cupboard, the glass top of a tropical aquarium, or some spot in a warm room not likely to become too chilled as temperatures outdoors go down make suitable storing places for the eggs. It is necessary, however, to take a look at the peat every so often to guard against the danger of its becoming tinder dry. Dampening the surface with a few drops of tepid water is something that may have to be done periodically.

The American publication mentioned above states that the eggs of *P. zonatus* require at least eight months without water in order to hatch out (I prefer to take such statements not too seriously). But let us move on. After a longish spell minus water, a little is added day by day or hour by hour at a temperature of about 75°F (24°C) but so violently as to churn up the peat. The eggs hatch at a rapid pace. Nature demands that they should. Large fry pop up every day or every other day. Newly hatched brine shrimp, gnat larvae, micro-worms, newly hatched *Daphnia*, and the like, must be provided for them to eat. Full grown *P. zonatus* will take prepared food (flake) but naturally prefer larger eatables (alive) such as tiny or chopped earthworms, concussed houseflies (uncontaminated by lethal insect sprays), fragments of raw red meat or baby woodlice dropped onto the surface of the water.

Those aquarists who enjoy success with their bottom-spawning aphyosemions should encounter little difficulty in spawning *P. zonatus*. It has been observed, however, that bottom spawners native to Africa do not dive so deep into the peat as do South American species. And another thing. The eggs of most African species hatch out faster than those of South American species: at least in the home aquarium which, after all, is the focal point of our interest and experimentation and breeding achievements.

Interestingly, Colonel Jorgen Scheel in his *Rivulins of the Old World* records that, the eggs of certain South American annual species can remain viable in wet anaerobic sludge for as long as three years. Apparently this can be construed as a 'rest' period during which the eggs can stay unharmed although buried among oxygen-deprived mud. Seemingly, the removal of the 'resting' eggs from a putrid mess of sludge to aerobic mud soon to be followed with a covering of fresh water results in the sudden appearance of healthy fry. I should have mentioned earlier on that the coloration of *P. zonatus* is not spectacularly beautiful (though its fins are). All the same, it has its attractive points. The back is olive-brown shading to bluey-green on the sides. There is an iridescent blue-green to lavender, or violet, spot on the gill-cover. The anal, dorsal, and caudal fins are well-developed and generously spotted with brown between the membranes. This spotting creates a most pleasing lace-like effect. There's more than a suspicion of orange or red in the anal fin, ventrals and pectorals. About a score of dark brown vertical bars extend from the gill cover to the root of the tail. The pupil of the eye is velvety black. The silver iris is touched with a suspicion of blue and some dark markings above and below the pupil (in the iris).

Although I said earlier on that breeders of the bottom-spawning aphyosemions should encounter little difficulty in spawning *P. zonatus*, I meant this in the academic sense; for *P. zonatus* is not an over prolific or ready breeder. In disposition, the male, of the species tends to be quarrelsome not only with males of his own species but with other fishes too; so, let's face it, *P. zonatus* is not a fish to buy for a community tank. And yet another word of advice. Keep the aquarium inhabited by a couple of *P. zonatus* well covered: it is an excellent jumper. Summing it all up then, *P. zonatus* is a fish to keep on its own in a tank about 18 in. × 12 in. × 12 in. furnished with hummocks of Java Moss (*Vesicularia dubyana*) or masses of young Indian fern (*Ceratopteris thalictroides*). The floor of the tank is best spread with well-washed rounded gravel covered with a layer of well-soaked (several changes of water) peat to rid it of excess acidity.

by
Eric Hardy

SEDGES OFTEN TAKE some time to identify. They include misnamed black bog-rush, spike and beak rushes, deer-grass, carnation-grass and cotton-grass, and form the second biggest group in the European flora. Their stems are usually, but not always, solid (fen-sedge is hollow) and triangular, and their spikelets of flowers usually hang down from the top of the stem for wind-pollination. Hybrids are headaches, however.

Spending another day recently at the Welsh Water Authority's Llyn Brenig reserve on the Clwydian moors, I made for the acid peat and heather bog with a flora enriched with some basic, alkaline flush-bogs on mineral soil where 14 sedges prevail. The warden told me with pride how they share with an Irish bog the only other "British" site for a hybrid sedge.

This is a cross between the dioecious sedge *dioica* and the star sedge *echinata*. It also has a vigorous bybrid between yellow sedge and tawny sedge. The reserve is the open, heathery peninsula between the two top bays. It's other waterside plants include bog-pimpernel, bog-bean, butterwort and marsh-violet, nothing else a rarity. This great modern reservoir boils with trout rising, and from this it has become the major haunt of great crested grebes in North Wales, with 6 nesting pairs, and mergansers, while the islet is dotted grey with standing herons. Its frequent goosanders should soon nest, as they do on Lake Vyrnwy and the Elan Valley reservoirs. Osprey and divers are among its visitors, dippers nest near the dam, and teal and sandpipers breed too. A pair of common terns were on the raft-islet.

Snake-poaching

Snake-poaching is an Americanism which hasn't yet caught up with this country. It worries the wardens in the so-called Barrens, the vast Pinelands of New Jersey. The poachers are commercial collectors of endangered northern pine-snakes and corn-snakes. There's also a Pines Barren tree-frog to go to show that only people who don't know the place call it barren. In fact, many natural wildernesses from the Dead Sea to the Grand Canyon of Colorada are far from the lifeless barrens popular literature has characterised. The Aravaipa Creek is unusual in Arizona's Grand Canyon in maintaining its native fish-population instead of the changes wrought about by dams elsewhere. When irrigation dams are established upstream in that famous area, populations of sun-fish, small-mouthed bass and mosquito-fish escape into streams below and decimate the native species. In the Aravaipa, native species are adapted to maintain position in the scouring flood-waters when introduced fish are swept away. Thus the river preserves 7 native rarities: gila and sonora suckers, speckled and long-finned dace, loach-minnow, round-tailed chub and spikedace.

Newts and adders

A friend wardening the Bardsey Island bird-observatory off Lleyn this past autumn showed his interests extended beyond migrating birds and wild flowers, for slow-worms and palmated newts were among his observations. Palmated newts are the typical species in most of Wales, as they are montane. But Bardsey has no frogs or toads. An 8-year-old holidaymaker, bitten by an adder at Pwllheli Headland in August's hot weather, ended up in Bangor hospital. Occasional minor bites like this occur when hot weather makes adders more active, as the ground has been well warmed by August and snakes aren't so lethargic as when they first emerge in spring to bask in the sunshine and develop their eggs, for the ground is cold. Few of the public seem to appreciate how widespread are adders on the heathy hills of North Wales, the Peak District and Lakeland where one was seen by Devoke Water, as well as on East Anglian and southern heaths.

The Nature Conservancy's newly declared national reserve at Stackpole, on south Pembrokeshire's coast, covers 492 acres and interests aquarists with its reedbeds and calcareous Bosherston lakes with their stoneworts, fennel-pondweed and spiked water-milfoil as well as more glamorous white water-lilies, plus a variety of caddis-flies and the occasional otter. Yarrow-broom-rape grows beside

the lake. Long-styled water-starwort, *platycarpa* is another rarity of south Pembrokeshire. It also grows in North Wales' River Dysynni near Peniarth. Stackpole reserve also has limestone cliffs with nesting puffins, guillemots, kittiwakes and choughs, and part of the Pembrokeshire coast public footpath. It certainly doesn't have the problems of U.S. conservationists trying to keep pure from pollution the pure water formed beneath the so-called "Barrens" pinelands of the New Jersey coast. The pollution results from new housing without adequate sanitation. Five of its reptiles are endangered by collecting and habitat changes: the eastern tiger-salamander, the Pine Barrens and southern grey tree-frogs, the bog-turtle and the timber rattle-snake. The futures of 4 more are threatened: corn and pine snakes, eastern mud-salamander and wood-turtle. The Audubon Society has expressed little confidence in President Reagan's new Secretary of the Interior, James Watt, as a conservationist.

The pond in winter

December isn't a very hospitable time for the water-gardener, but it is surprising how often days are mild enough for newts, water-boatmen and gyrating whirligigs to be seen on the garden pool and in the farm ponds, with dead red-brown water-dock and tall light brown *Phragmites* still adding dignity to the waterside. We no longer see the daily up and down rythyms of roach and perch as in summer pools. Taking their temperature from the colder water, goldfish lose their appetites, but will sometimes take small garden worms even when there's ice on the pool. Many small pools are covered with planks to avoid ice forming. So long as the pool does not freeze almost solid, even peacock bass fed on live and dry foods will winter outdoors in many places, with sheltering weed of course. Some fish-keepers insert a 100 or 150 watt fish-tank heater and switch on for frosty nights, to keep a small hole open to allow dangerous gases to escape and fresh oxygen to enter. Ponds can be oxygenated as much from surface water as by submerged oxygenating plants. A popular habit of placing a block of salt on the ice to open a hole may lose your fish.

Slow growing Japanese dwarf maples are sometimes planted near pools for their decorative foliage, but their roots, like azaleas, must be out of the subterranean water-table, preferably at a drier rockery, as seen at Kew. From spring's golden fans of new leaves through summer's rich reds to their flaming tints in autumn, they bring exquisite colour to the waterside. They need shelter from cold east winds in spring. Do not mistake "black dogwood" for true, stem-coloured *Cornus* species of the waterside. It is a nickname for deciduous alder-buckthorn *Rhamnus* (*Frangula*) *alnus*, a waterside plant of limited attraction, and abundantly wild at Wicken Fen. Its thorny relative, *catharticus*, related to cascara of the medicine chest and truly called purging buckthorn, is immune to nibbling rabbits. An evergreen relative *alternus*, with a variegated leaf-variety, is suitable for a seaside garden where more glaucous foilage-plants seem best. Rich autumn colours adorn deciduous *imperitina*. Winter is, of course, the time for planting waterside trees, during their dormancy; but canned—or container-rooted trees from modern garden centres are now available for introduction at most times.

Balsam-poplar

Balsam-poplar, a shrubby American cottonwood tree of damp soil, *Populus gileadensis* (*balsamifera*, etc.), named from the pleasant smell of its viscid brown buds and unfolding leaves grows only too well, suckering freely if you cut it back. It produces magnificent long yellow translucent catkins in February and March, the stigmas later turning pink. The slightest injury or breakage starts it suckering. With all fast growing, surface-rooting poplars, the more you cut them the more they sucker and spread, as a bush, soon becoming a pest. All plants here are female, so it doesn't set seed and is probably of hybrid origin with northern cottonwood. It will grow to 20 or 30 ft. with leaves quaking like an aspen. *P. candicans*, sometimes catalogued as a separate species sharing its odour is a synonym. So is *tacamhaca*.

Most poplars grow quicker in damp soils than dry ones. Anyone with great trees will be astonished at the water they drink. In a single summer's day, a middle-sized apple tree will lift 800 lb. or 80 gallons of water out of the ground, and a 40 to 50 ft. waterside willow 500 gallons. All the great specimen trees I have seen grow with their roots near water, like the two greatest Welsh Douglas firs near a pond in Powys Castle Park and beside Lake Vyrnwy; or in regions of heavy rainfall like those beside the Hawkshead Road at Monk Coniston. When I visited the great tree of Ein Husb, which Lawrence mentions in his Seven Pillars of Wisdom, during an expedition through the Wadi Aravah collecting plants for the British Museum and Jerusalem University south of the Dead Sea, I noticed it grows right by the speing (Ein) of Husb. It is the biggest known Christ's thorn or *Zyzyphus spina-christi* (synonym *Paliurus*), 40 ft. tall and nearly 20 ft. circumference, 6½ ft. in girth with a branch spread of 30 yards.

How much more beautiful in winter is a pollarded violet willow, *daphnoides*, arrayed with violet young shoots covered in a blue-white "bloom"; or the erect variety of purple osier, *eugenei*, forming a small, pyramidal tree; or golden yellow young shoots of *Salix alba chrysostella* shading to orange-scarlet, Likewise dense, woolly shoots of rapidly growing hybrid *stipularis* or the large bright yellow weeping *alba tristis*; and hardier and stronger growing than *babylonica* the weeping hybrid *sepulcralis*. By the way, *Salix* twigs collected now for indoor vases usually remain dormant in a warm room. Many collected in January expand their buds in 2 or 3 weeks, and buds burst on these taken in February or March with increasing rapidity indoors.

The connoisseur of trees will find a dictionary of over 3,500 woody plants with more than 600 colour-photos in Hillier's *Trees & Shrubs* (paper back £3, Hilliers Nurseries, Winchester), and over 8,000 in his *Manual of Trees & Shrubs* £5·95).

Aquarium spawning of Koi

by William Ross

HAVING KEPT COLDWATER and tropical fish for many years, it was a great joy to me when we moved into a house of our own in 1971 and were fortunate to have a fairly large garden by today's standards. The year after our move I installed a pond 18 ft. × 12 ft. × 2 ft. enabling me to keep and breed goldfish for the next five years. April 1977 saw the purchase of my first Koi and the end of my Goldfish keeping days for the time being. In the Coldwater Queries section of 'Aquarist and Pondkeeper' of December, 1979, Mr. Arthur Boarder replied "I see no reason why Koi should not breed when they are from 9 inches overall". I now find myself in a position to confirm Mr. Boarder's comment but wonder if he ever conceived the idea that this may be achieved in an aquarium. I have been very fortunate to have a pair of Koi spawn in an aquarium.

Since living and working in Saudi Arabia's Eastern Province I have been able to continue my fish keeping activities but with the difference of being able to collect a number of fish from the wild which has been very interesting to say the least. On 1st May 1979 I paid a visit to the only aquarium shop at that time in Al-Khobar. Amongst a shipment of fish received from Singapore was a number of 2½-3 in. Koi. One of these drew my attention immediately; it was basically a pale blue fish showing green highlights with the large mirror scales of the German carp. I believe this is called Raigo amongst the Koi keepers. I was quite fascinated by the beauty of this fish and it appeared to be in very good health so I purchased it. Knowing Koi do not live happily on their own I scanned the shop's aquaria for another Koi and finally settled for a normal scaled Yamatonishiki. My original intentions were to bring these two lovely fish home to Britain when next I came on leave, try to acclimatise them via my fish house and hopefully add them to my pond. For one reason or another these two fish as yet have not made it to Britain.

My two Koi were at first accommodated with some Platies but as they outgrew their companions they were moved to an 83 cms × 35 cms × 35 cms aquarium of their own. Undergravel filtration was installed and some Hornwort (*Ceratophyllum demersum*) was used for decoration. At first the Hornwort was weighted down with strips of lead but as the fish kept breaking the plants I

discontinued using the weights and left them floating free. I do partial water changes weekly. This aquarium is in my bedroom which is air-conditioned with a room temperature around 26°C. Over the past two years that the Koi have lived there, the temperature has never been below 22°C and sometimes as high as 29°C. I would have liked to build a pond for these fish here in Saudi but at my place of residence there would be no way of keeping the fish secure. The possibility of them ending up in a frying pan is a real danger as that is about the only interest shown in fish by most of the local gentry. At first I fed these two fish on flake food, small pieces of fish, chicken and beef from the kitchen table. As they grew I replaced the flake food with a good pellet food.

The Koi developed into two nice fish, the Raigo 23 cms long with a nice deep body, the Yamatonishiki slightly shorter at approximately 22 cms and a more streamlined fish. Early in June this year the Yamatonishiki became quite rotund and lopsided; she was full of eggs. In the last week of June there was an odd show of chasing by the Raigo but nothing very serious. On the evening of 29th June the pair were given a rare treat of a little live food, something not easily obtained here. They were fed their usual pellets on the 30th June before I left for work. On returning to my room at lunch time I thought I had a cracked aquarium as the carpet was saturated with water. At a quick glance the water in the Koi tank was noticeably lower than its usual level. A closer examination showed a very much thinner Yamatonishiki and numerous eggs could be observed on the plants, in the gravel, sticking to the sides of the aquarium and some sticking to the cover glass clear of the water. From the water on the floor and the eggs attached to the cover glass I deduced it must have been quite an active spawning in their confined quarters. The adult fish were removed to another aquarium of similar size. The water in the spawning aquarium became very cloudy and considering this tank had not been prepared for a spawning I thought the cloudiness was dirt in suspension having been stirred up during the spawning. In spite of a partial water change and the filter working at its usual turnover rate, the cloudiness persisted; it resembled an infusorial bloom. The following day the parents' tank was also in a similar condition and I now have thoughts that when Koi spawn *infusoria* is released by the fish possibly in their excreta similar to the excretion of *infusoria* by Apple snails. This may be a built in mechanism to prepare food for the fry when they hatch out from the eggs.

The first fry were seen sticking to the sides of the aquarium late in the evening of 2nd July; these were approximately 0·7 cms in length. By the 4th July some fry were swimming normally and some were still attached to the glass. These fry would swim for the surface in short bursts and I presume this was then attempting to reach the surface to fill their swim bladders with air. By July 5th the water in the aquarium had cleared so I commenced feeding with Liquifry and some very fine powdered fry food. The 6th July saw my brine shrimp hatchery produce *nauplii* which were greedily eaten. On 9th July the fry food was replaced with growth food which has slightly larger particles. At the time of writing the fry are growing rapidly on a diet of growth food and brine shrimp nauplii.

At this time I have an aquarium with various sized fry which I hope to be able to grow on and see the colour variations produced from my first Koi spawning. As yet I have had no success with my Koi in Britain. I am very fond of Koi and if it had not been for the dangers of having them in a pond here I would not have been in a position to have an aquarium spawning of these fine fish. I hope some day in the future to be able to write about the development of these baby Koi.

PRESS RELEASE

New Fish Posters

WATERLIFE Research has newly introduced a magnificently illustrated pair of tropical fish posters which should appeal to the hobbyist.

The posters, each 24 in. × 18 in. are printed in full colour on glossy paper and illustrate over 500 tropical fishes. The accuracy of illustration is very high and allows for quick and easy recognition of many fishes, rare, unusual and common.

Apart from instant interest for the newcomer to fish-keeping the fact that fish are given both common and scientific names will appeal to the more experienced aquarist. Whilst not printed precisely to scale, the sizes of illustrations gives a good indication of many fishes' comparative size and so proves valuable in selection of compatible tank-mates.

These posters make a perfect gift at any time, but with Christmas at hand, would make the ideal small present for hobbyists, both young and old.

The posters are available, by collection, from SeAquariums, 476 Bath Road, Longford, West Drayton, Middlesex, price £1.50 a pair, or by post from the same address, price £2.25 to include postage for mainland Britain, and packing.

BEGINNING WITH TROPICALS

Part 13

by Roy Pinks

I WONDER whether readers would agree with me in regarding the period between 1950 and 1970 as the Golden Age of tropicals? Although there are vast quantities of fish available today, probably of better quality than they have ever been, the range of available species seems to have contracted. Saturation collecting, political unrest and natural disasters have all contributed to an erratic state of affairs, so that we have to make the most of our opportunities as they actually arise. It was once comparatively simple to run through a book, noting down what took your fancy, and returning from your shopping with but few blanks on your list. From the point of view of most home aquarists, this is not serious, as it merely clips the wings of the keen collector, but it is embarrassing for writers because we often receive critical letters which state that our most warm recommendations are just not available. I certainly sympathize with such complaints; however our notes are usually intended to help buyers mark up their diaries with lists of prospective winners, so they usually pay off in the long term. I will therefore continue to nominate a few more species which are thoroughly suitable for the beginner, but which I did not manage to acquire during the past year. Those with a spare "growing on" tank, as I have already recommended, will benefit most by being able to snap up suitable specimens as they appear.

X-Ray Fish

Since shoaling was one of the attributes I especially sought, *Pristella riddlei*, or the X-Ray Fish, was a species I most regretted missing. Half a dozen of these ought to have rivalled my Platinum Tetras for sheer elegance and lightness of touch, and I regard them as grossly underestimated in so many directions. Though the black and white dorsal really sets them off they are, it is true, just another silvery looking fish when viewed at the dealer's. But when they have settled down, the translucency which gives them their popular name becomes really very hard, and an otherwise unexceptional fish

comes into its own. Pink hues also appear in the finnage, which becomes quite beautiful if the tank lighting is tailored to accentuate these tones. Plantings which create light and dark spots are highly effective when using fish like these, as their highlights come and go, intriguingly, as the fish proceed on their business. They are mainly to be seen in the middle and upper water, and they show themselves well, rarely retiring, so that if they do begin to skulk you may well assume that some trouble is afoot. Like most of the small tetras, feeding is quite straightforward, and they will accept both flaked and small live food.

A decorative Tetra

The Rummy Nosed Tetra (*Hemigrammus rhodostomus*) has become one of the most popular and decorative of the tetras, but unlike the X-Ray, it is fairly costly—usually well over £1, whilst the other little fish can usually be obtained for about 45p. Most who have kept the Rummy Nose will speak highly of its startling red face and its contrasting black and white rear, which includes barring of the tail. It is a most accommodating species, has no feeding quirks, and certainly gives good value as an exhibit. In view of its price, do make sure that you secure really good specimens. In practice, imports are usually pretty sound, and some of them quite outstanding, so this is a fish which, despite its cost, may be bought quite confidently. The only possible trait which might not appeal to some is its extreme mobility, and it has often struck me as behaving, like some others, as though it is constantly trying to get out. Older and more settled specimens seem to shed this tendency, so do not be too put off. Two or three per average tank should be enough, as they are very impressive and if overdone they will destroy the visual balance.

A beautiful Fish

Hyphessobrycon herbertaxelrodi, the Black Neon Tetra, grows to rather less than 1½ in., and, like the X-Ray, is passed over far too often. Its silver and black horizontal areas are separated by the most glowing of green luminescent lines, and as it is willing enough to shoal, given 6 to 8 specimens to make it up, it immediately makes an impression in a tank with suitable lighting. I think that a number of very excellent species like this, which do not come across too well in the sale tank, provide some of the most pleasant surprises when a little thought has been given to their management. The truth about this fish is that it is seldom imported much above ¾ in. in size, at which stage its contrasts are just not evident. This is rather like the case of the Emperor Tetra, though here even the small specimens seem to get snapped up, possibly on account of scarcity appeal. The Black Neon, when full size, is an astonishingly beautiful fish, and if it moved around the tank as freely as the X-Ray, I think it would be a world-beater. As it is, it is fairly dignified and will remain comparatively motionless for periods, so it has gained in popularity but slowly. I have always found it a hardy, peaceful and altogether charming fish, and as it is rarely more expensive than the X-Ray it doesn't really wreck the cheque book if you do buy a whole shoal. Whilst the above are more often available than they are not, the Flame Fish (*Hyphessobrycon flammeus*), which used to arrive in such vast quantities, now seems to be something of a scarcity. This is a real jewel, often under 1 in. in length, with a rosy transparent body. On account of its size you really need a dozen or so to make anything like a shoal, though perhaps "group" is more accurate in a sense. This is because, though pairs of these fish will embark on endless courting and spawning displays, younger fish will often form up and remain motionless for long periods, lacking the thrusting motion of the true shoaling fish—at least, such has been my experience. The Flame Fish is easy to keep and to feed, and is about the best spawner I know. Its appearance in contrasting lighting is delicate and soothing, and it is best associated with feathery plant foliage as exhibited by Myriophyllum species. Its sole failing, I suppose, is its comparatively short life, but as this is no doubt occasioned by its unending efforts to procreate itself, one cannot complain. Its flirting is brilliant and dainty, and here is a bonus for the intending beginner at breeding, as conditioning is easy and the fry are not difficult to rear, being far bigger than one would have imagined, scaled against their parents. Their cost would be about 40-50p, comparable with that of most of the commonly available small tetras.

Net in hand in Borneo

Part 2

by Anders Wickman

An Iban woman turned over the stones in search of spiny eels, shrimps, glow catfishes, etc. In the background, where the river can be seen foaming, is the home of the Flying Fox and the small green catfish

It is, above all, this little red shrimp that the Iban woman seeks

BACK IN THE LONGHOUSE I deposit my bucket of fish on the Verandah where it is coolest. Not that I seriously believe that I will be able to take any fish with me out of the jungle to Singapore and eventually to Sweden without them dying in the process, but I intend at least having a try. I can arrange ventilation, but the intense heat on the way back across the lowlands will no doubt be critical, because these fish are used to clear water with an abundance of oxygen and a temperature of 75°F.

All the children in the Longhouse crowd round me and my bucket. They are certainly not impressed with the fish, but the air pump, when I turn it on, is a smash hit. Without the least concern I leave the children with the fish and go inside. The Iban children are extraordinarily well brought up, as I have already seen on several occasions.

Inside the Longhouse I almost trip over one of the fighting cocks, causing it to take fright and make a terrible racket. It is tethered with a line about one metre long. All the cocks are tethered in this way to keep them from fighting. I calm the cock down by patting just as if it were a dog. Strangely enough, it is very tame.

Getting to my feet again I happen to look up into the roof, and to my astonishment I see about twenty skulls suspended in a kind of net. A little further away I see still more. I call Thomas and point at my discovery. He asks me not to betray too much interest. Headhunting has long been prohibited, officially, and the matter is one of some delicacy. Thomas says that it has no doubt been several years since anybody in this Longhouse brought a head home with him, but who can really keep check of everything that goes on in this virtually impenetrable mountainous jungle?

Tradition has it that when a headhunter marries he should present his bride-to-be with a recently taken head as evidence of his manliness and of his being worthy to marry her. Thomas says that it makes no difference whether the head comes from a warrior, a woman or a child. Usually a head is taken from a tribe from which it is "owing", so to speak. And of course one always decapitated enemies in battle. I presume that many of the skulls now leering at me from the roof belonged to Japanese soldiers who invaded Borneo during the war and lost their lives to the silent, poisoned blowpipe arrows of the Iban before their heads were severed with the special knife of the headhunters.

Despite the macabre decoration of the roof, we do not feel concerned. One is more inclined to feel a sense of security in the company of the Iban. They are incredibly friendly, polite and hospitable. They may be as naive as the primitive savage, but they lead their lives here oblivious to the rest of the world. Nature gives them what they need. I find their company very stimulating.

We are sitting on the bamboo floor round all the food bowls, eating a dinner made up of mountain rice, the flesh of wild pig, fish and a kind of potato that tastes like chestnut. (And various kinds of fruit.) The food is well-prepared and tastes excellent. We eat with our fingers. The women and children eat when the men have finished.

As we are tired, we roll out our raffia mats for an early night. Through the thin partition we can hear the men getting steadily merrier and noisier. There is no shortage of the excellent rice brandy in the Longhouse.

It is a sunny morning next day, and out on the verandah, while I am taking a look at the fish in my bucket, I meet one of the elderly warriors of the Longhouse. He is richly tattooed with floral patterns. Each symbol has a particular meaning. Most of his knuckles are tattooed as well. Thomas has already told me that you can easily tell which warriors have taken heads, because they are entitled to tattoo their knuckles. This one wants to show me his blowpipe. It is two-and-a-half metres long, heavy and fitted with a bayonet at one end. The blowpipe is made of a very hard wood, and I know already that it takes several months for the warrior to make. The bore has to be absolutely straight all the way through, and the diameter must be gauged exactly. The arrows are needle-sharp bamboo sticks one decimetre long, soaked in a paralysing poison. At the end of the stick is a small balsa wood plug of the same diameter as the bore in the blowpipe, about one centimetre.

The old warrior hangs up a raffia mat on a line by way of a target. Then he points to the centre of the mat, walks about twenty metres away, lifts the blowpipe slowly and shoots. I never manage to see the arrow, but I can hear the force with which it strikes the centre of the mat. Laughingly he hands me the blowpipe together with a couple of arrows, points at his arrow and tells me to shoot. The blowpipe is heavy and difficult to hold steady long enough to aim. The arrows, on the other hand are as light as a feather. I have soon mastered the technique and manage to get in some fairly accurate shots at the mat. The arrow has an extraordinary impact and I can very well understand its ability to fell a wild pig. The bayonet at the front turns the blowpipe into a very useful weapon for fighting at close quarters if the hunter should be charged by a wounded wild pig.

I return to the riverside where I plan to spend the rest of the day. I am now equipped with an excellent Iban fishing net—small but stout and with just the right mesh.

My Flyingfox are here today as well, and I can see specimens of all sizes up to eight centimetres. All of them have their heads pointing into the current. And then I suddenly catch sight of another little fish that is able to move far more freely. Its body appears to be divided or hinged into two suction pads. The specimens I can see are bright green and none of them is evidently more than three or four centimetres in length. Clearly they are well adapted to life in these conditions. The strong current does not seem to affect them at all. The Flyingfox appears to find the going much heavier than they do.

I give the net a try and it works perfectly. The Flyingfox is an easy catch, but the beautiful small green fish dart from one stone to another with the speed of lightning.

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A TANK IN THE WALL

by M. S. Brennan

IT ALL STARTED about eight years ago, when my wife and I had a go at keeping tropical fish. I had this idea to set a fish tank in a wall between two rooms. I considered there was a perfect setting in which the tank could be viewed from either the lounge or the kitchen.

Now, it's one thing for the better half to happily accept a novelty like a fish tank, but try explaining you want to knock out a large hole after the rooms had just been decorated! Anyway, with a bit of sales talk the whole thing was agreed and it was just a question of buying all the equipment and getting it fixed up.

I leafed through a few books but could find nothing on such a project. It seemed such a good idea at the time! Surely there could be no better way to show off the fish?

At this stage I should mention, my wife was starting to get grave doubts and enquired why we could not have the tank on a stand like normal fish keeping people. Anyhow, I went ahead for better or for worse, and believe me it was for the worst. I had given little thought where to house the pump/starter unit for the fluorescent light, but eventually decided on building a small recess next to the tank.

The big day arrived and everything was ready to go.

My wife was nearly driven mad by the noise of the pump. Even the budgie had stopped talking and started to hum. Although pretending it was quite bearable, it was a mistake to have it in such a confined space. Every so often the vibration of the pump sent the door that enclosed it flying open! The final crushing blow was that within the space of only a few weeks you could hardly see the fish for algae. The tank faced large windows on both sides which apparently caused the trouble. Not even the plants made an attempt to grow, and the poor old fish died at regular intervals.

When we decided to move house, few tears were shed over leaving it all behind. I sometimes wonder if the couple who bought it have converted the hole into a serving hatch!

Anyhow, six months ago I got the urge to try again. The look on my wife's face will be imprinted on my mind for ever when I suggested trying the same thing. It's said that true love can stand anything but even I wondered if I hadn't taken things a bit far. Well, eventually I got the green light for the mark II version, and this time decided to give the whole thing a lot more thought.

First of all was the positioning of the tank. Every room in our newly acquired house had to be decorated, so I considered every possibility. The best place was, without a doubt, the wall between the lounge and the hall. Neither side of the tank would directly face a window, so I was hopeful that algae would not be such a problem. I read all the books I could get my hands on, and realised the bigger the tank, the better the chance of all around success. So the 48 in. × 12 in. × 15 in. job was purchased and stored in the garage until required.

I made up the hardwood frame for the tank to sit in, allowing a small ¼ in. gap either side and a similar allowance at the top. I then removed a floorboard adjacent to the wall to make sure it was built up from the ground level, and not just a partitioning wall built up from the floorboards. Obviously it was essential to make sure the wall could take the weight. I reckoned the whole thing set up would weigh about 320lbs, and I didn't fancy finding out first hand if the insurance company would make a drama out of a crisis!

Next I carefully cut the hole out using a sharp bolster chisel and hammer. Anyone wishing to contemplate such

a project, must at this stage, at all costs, send the family out for the day. At least you can get the worst of the mess up yourself and avoid the vacuum cleaner hovering under your feet. A definite hazard!

The next job was to fix the frame into the hole, and for this I secured it with rawlbolts on all sides. The tank fitted (thank goodness), so it was time to move on to the wiring. With the tank nicely set at head viewing height, I really wanted to avoid looking at a mess of wires running out of the top of the tank and down to the wall socket. Moreover, I had given the wife a cast-iron guarantee that somehow or other I would silence the noise of the pump to a level that the television would not be actually fighting for the controlling interest.

In the hall, common to most houses, is a cupboard under the stairs in which the gas and electric meters are kept. With the chisel I cut a 2 in. channel on the hall side, from the top of the tank to the skirting board, and fixed two lengths of plastic conduit (purchased from any electrical shop) to the wall. I then threaded all the wires for the thermostat/heater/starter motor for the fluorescent light, and the tubing for the under-gravel filter, down the conduit, behind the skirting board, and underneath the floorboards, up into the stairs cupboard. (I thought it was safer to plaster over the conduit after checking whether it would actually work.)

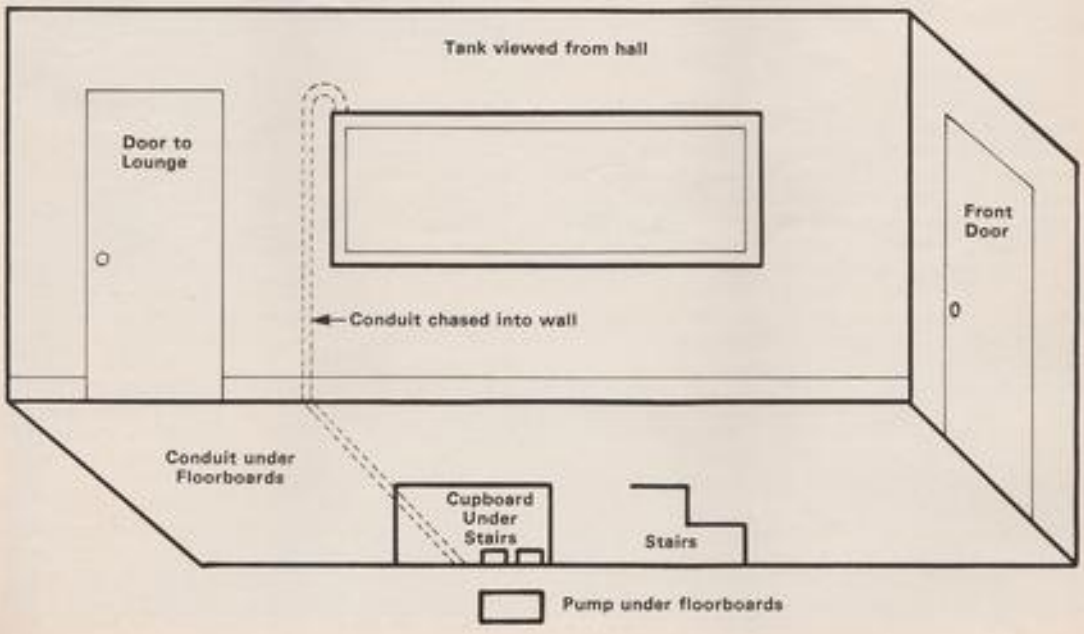
Now my real brainwave, even if I say it myself, was to leave the pump under the floorboards—but leaving a board loose in the cupboard so it would be easy to gain access for maintenance. So I wired everything up, filled the tank with water, and it was time to switch on.

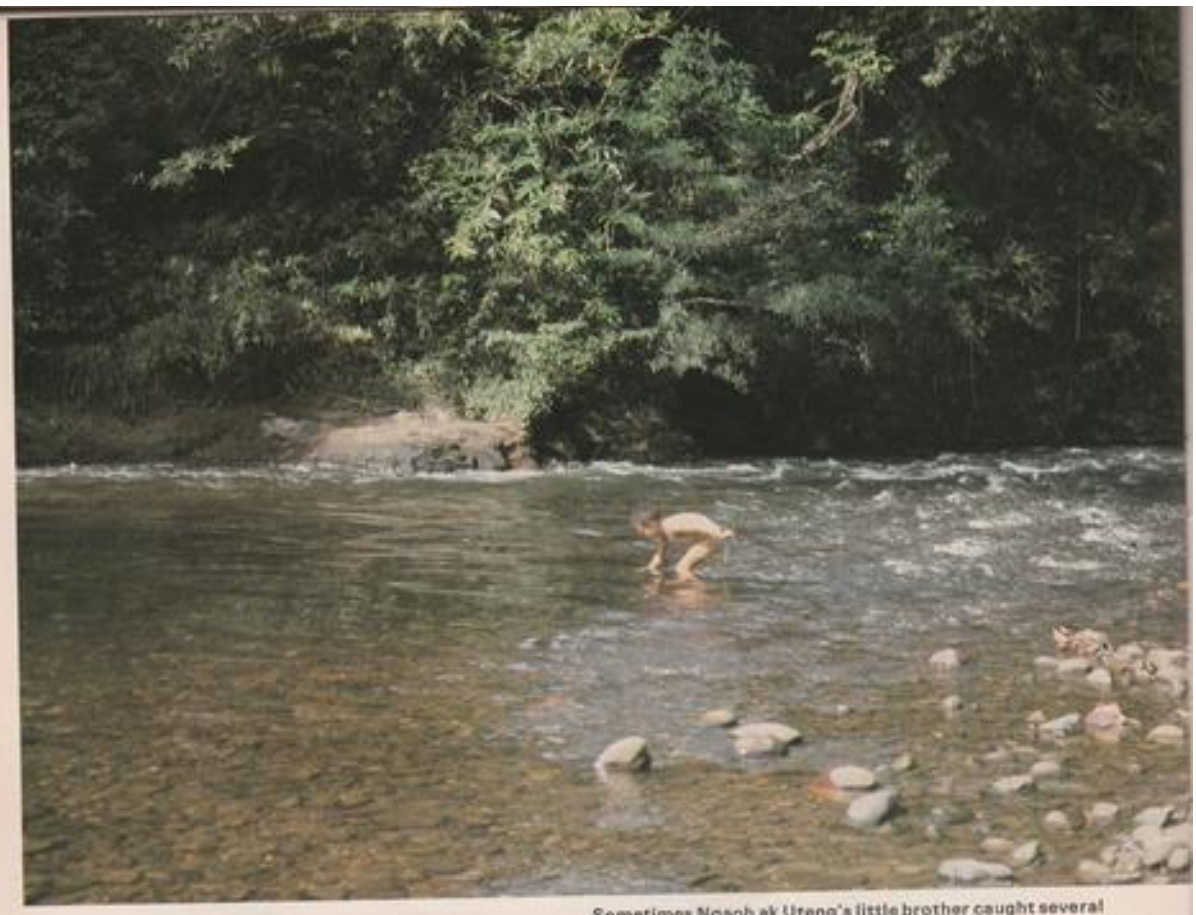
The hum of the pump was hardly audible. Considering it was pushing the air through about fifteen feet of tubing—and six feet of that vertical. I was delighted to see it was delivering just the right amount of air into the tank.

So six months later I am still waiting for the problems to start. Other than the odd fish lost, all the other twenty-five are thriving. I get no algae that the catfish can't handle and all the plants are growing very well. As the tank can be viewed from either side, the plants and rocks are arranged in such a way that from the lounge and the hall it's almost like viewing two separate tanks.

The only real drawback I have found so far, is that you don't have quite as much accessibility into the tank as you would have in a normal set up. However, I am quite able to get right to the bottom of the tank with my hand so it's not presenting much of a problem.

I would appreciate learning of other readers who have tried this idea.





Sometimes Ngaoh ak Uteng's little brother caught several of the small green catfish with my cast-off net

Continued from page 49

To make things more difficult, I have to take very great care not to fall over, because if I were to do so the river would carry me off on a shooting-of-the-rapids that I would not forget in a hurry. I manage, however, to capture two specimens by jerking an entire stone into the net.

Slowly I wade ashore with my new acquisition, which I immediately put into the photographic aquarium. What an extraordinary fish! It looks as though its pectoral and ventral fins have been converted into two separately functioning suction pads. It immediately battens onto the glass wall, obligingly presenting its belly to the camera.

An elderly woman comes along the shore carrying a plaited raffia basket. She walks in the water beside the rapids where I was standing and I see how she dips the basket into the water at the same time as she lifts up stones in front of it. Evidently she is fishing for something in the river. My curiosity aroused, I walk over to her and she gleefully shows me the contents of her basket—a host of squirming shrimps and a little black catfish which she gives to me. I walk along with her for a bit and she teaches me the technique. The idea is to press the basket against the river bed so that the water runs into it and then out again through the interstices in the bottom. It works rather like a net. Then you lift the stones in front of you, and if there is a fish or shrimp underneath any of them it will be swept into the basket instantly, before it has time to swim off. The shrimps are very pretty. Most of them have red stripes. Others are almost entirely green.

Using my net, for want of a basket, I try the method the woman has just taught me. It works quite well, but I am only catching shrimps. Then all of a sudden when I lift up a stone, a spiny eel rushes forward, straight into the net. I must admit that I am surprised, because I always imagined the spiny eel as a denizen of calm and cloudy waters of the kind you get in a paddy field. It is very beautiful. Its body is striped like a tiger's and there are rust-coloured patches on its tail. It reminds me of the peacock spiny eel.

I carry on fishing by the "turn-stone method" all afternoon. By the time I return to the Longhouse I have caught another spiny eel and a very lovely species of goby about seven centimetres long. I also have a number of small black or brown catfishes of the kind which do not readily show themselves in daylight, plus

the colourful shrimps and five or six of the small green beautiful fishes, the smallest of them perhaps 0·8 centimetre and the largest 3·5.

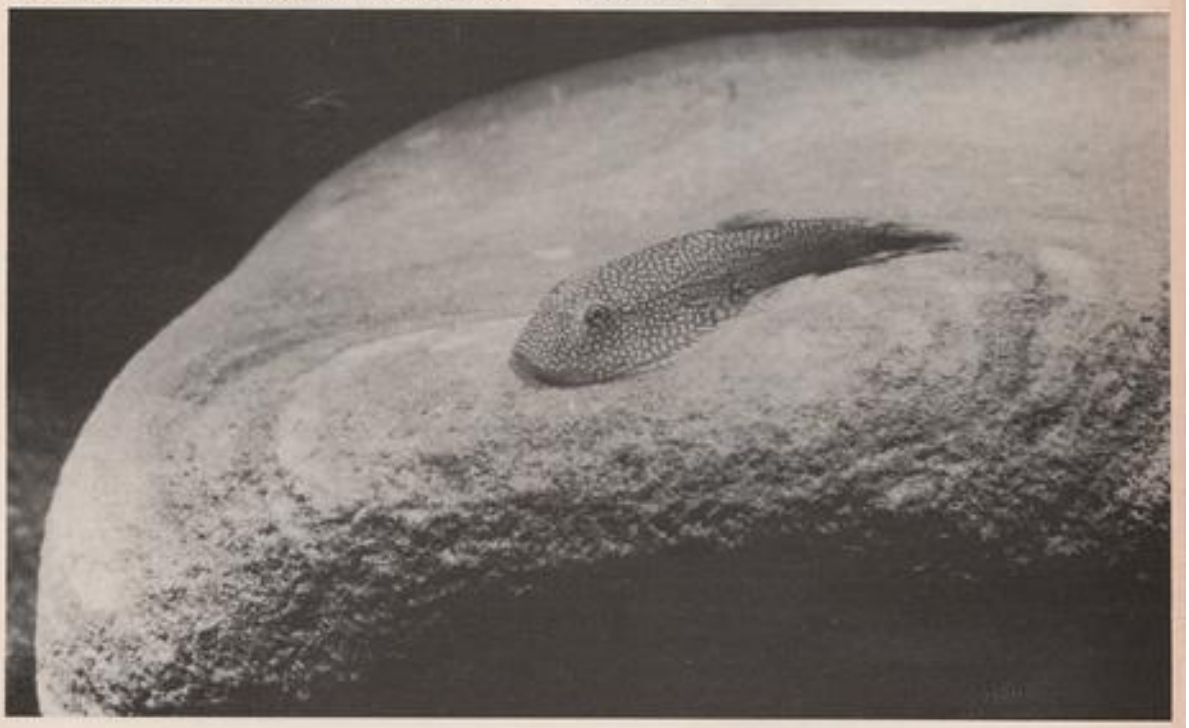
Inside the hut the headhunters are preparing for a feast. It is pitch dark outside. I can hear the music in the next room getting steadily louder and more rhythmic, and then Ngaoh comes in and signals to us to accompany him. Small oil lamps are burning everywhere. The women and many of the children are ceremonially dressed, with glittering earrings and finger-rings. The music grows more frenzied and then one of the Longhouse warriors comes into the centre of the room and begins to perform what I interpret as a war dance. Thomas whispers that this is the dance the warrior performs when he returns to present his bride-to-be with a newly taken head. In the dancer's belt I can see his parang, the long knife of the headhunters. At the end of the dance he is vigorously applauded by all the onlookers and more rice brandy is poured out.

Then a beautiful young girl enters and begins dancing in time to the music. Thomas explains that she is performing the dance which traditionally betokens her acceptance of the warrior's gifts and her acknowledgment that he is worthy of her. I take a few pictures and at the same time let off my flash gun in the direction of the skulls hanging right above me. The atmosphere is indescribable. Everybody is raptly following the dance, and the children sit watching in silence. It is a long and fascinating evening.

Early next morning it is time for us to take our leave of the headhunters. As a token of our gratitude we leave a number of things which we have already promised as gifts—shoes, T-shirts, torches and so on. It is an enchanting morning. The bird song is more intense than ever. We load up the canoe and push it slowly out into the water. I turn round and wave to all the people standing on the shore.

Between my legs I have a bucketful of the River Skrang's inhabitants. Will I be able to keep them alive? The canoe gathers speed and we leave behind us a heaven on earth.

It was interesting to see how this little green fish operated in its biotope. No specimen was more than 3.5 cm. long and the smallest one I found was 0.8 cm. long but fully coloured



Bargains from Algarde!

ALGARDE HEATER/THERMOSTAT HOLDER (two piece) price 34 pence; Algarde Two-Way Gang Valve Starter Kit, price 42p; Algarde Gang Valve Extension Kit, price 42p; Algarde Aquarium Scraper, price 70p; Algarde Tongs (20in.), price £3.00; and Algarde 'Volcano' Decorative Under-Gravel Filter, price £1.30; all manufactured by Algarde Enterprises Ltd., Hall Lane, Upminster Common, Upminster, Essex, RM14 1TT; telephone Ingrebourne (04023) 71702. (All prices quoted are subject to V.A.T.).

Reliable holders

No doubt you too have, on occasions, bought a heater/thermostat holder that has subsequently turned out to be a disappointment, e.g. it has been designed to take a narrow-tubed heater or thermostat or combined unit and cannot accommodate one with a thicker glass tube; it has fallen apart; the sucker or suckers have either disintegrated in the water or hardened or fallen off after a relatively short period; or you've discovered that the spare holder you wanted to use with a narrow glass tube was designed only for a thick-tubed unit. No doubt, on other occasions, you've bought holders that have done and continue to do a good job.

Recently, when reviewing another product, I read about an Algarde heater/thermostat holder, consisting of two pieces, that could be adjusted to fit either thick or thin-tubed units. It sounded like an interesting concept and I was disappointed when I discovered that my local pet shop did not stock the item. Finally I decided to write to Mr. F. W. Gardner, a director of Algarde Enterprises Ltd., to ask for some information. He sent me a most helpful letter and two pairs of the holders to test for myself.

Mr. Gardner told me that Algarde introduced the two-piece holder at the Harrogate Show in 1979, since when they have sold over 113,000 pieces without having received a single complaint so far.

I was delighted to test the two pairs of holders and to discover that the box containing the two—hence, two-piece—holders at 34p actually contains six small, plastic items that slot together to form a pair of heater/thermostat holders. Each holder in the pair consists of a cream-coloured little, plastic 'block' curved on one surface to fit against any normal size of heater, thermostat or combined unit. The clear, soft-plastic sucker that is the second of the three pieces easily slips into a circular hole in the 'block', and is held in place by eight tiny 'teeth'. The third item is a flexible plastic strap with serrations on one surface.

The assembly instructions supplied state: "Thread strap, with serrations on the outside, into end of body with single slot and push suction cup into bottom of body. Place heater on top of body, pull strap over heater and thread end into smallest slot. Pull tight and thread end of strap back through large slot. *Do not* pull strap right through second slot until heater is in position, otherwise strap will lock and become difficult to remove."

That may sound a little difficult to understand; but the little box is well illustrated and the directions are perfectly easy to understand. (I will admit that on one or two occasions I found it quite a pull to get the strap through the slot—probably because my hands were wet, and because my left hand, seriously damaged in an accident with broken aquarium glass a dozen years ago, is not nearly as strong as it used to be prior to the accident.)

I do not wish to labour this point because I managed to tighten the strap perfectly well, using my teeth on one occasion, and I am certainly *not* making this comment as a complaint. The thing that appeals to me about these holders is the fact that one *can* thus adjust the strap (and thus holder) to fit tightly onto any size of heater tube. Another thing that appeals is the fact that each holder actually consists of two identical units that can be placed as close together, or as far apart, on the same heater as

one wishes, e.g. they could be only a couple of inches apart on an ordinary heater, but just as easily, say, 7 in. apart on a combined heater/thermostat. Another attraction is the fact that their small size makes them inconspicuous; and easily concealed. Normally, in planted tanks one attempts to completely conceal the whole heater and thermostat, or combined unit. These extremely sturdy holders enable one to fix a heater unit in any required position in the knowledge that it will stay firmly fixed there; and, hence, it can be concealed in the knowledge that it will not slip out of its holder, or get knocked out the first time a scraper nudges the unit or the cable happens to get a gentle, accidental tug —for whatever reason. (Heating units should be switched off before one starts to work in an aquarium.)

I wondered about the life of the units; and about how they would stand up to the direct heat from a heater if fixed quite tightly round one. (I wondered if they would melt or deteriorate quickly if in contact with an aquarium heater.) Mr. Gardner told me that the holder was well tested before being put on the market; and that the original samples are still in the firm's experimental tank. "They are fixed to a 75 watt heater and show no signs of deterioration as yet, although the suction cups are no longer as transparent as they were; due, no doubt, to absorption of impurities in the water which we introduce quite frequently during our tests. The straps, which are made from a different material, are not affected."

There are many good products on the market for use by the aquarist. Numbers are similar to other equally good products of different brands or slightly different designs. I consider this holder to be an excellent product—and I do not use that adjective very frequently. Suffice it to say that after I had tested the two sample holders sent to me I immediately bought myself a dozen of them and changed over to them in all my tanks. Quite simply, they are the best holders I have had the pleasure of using; and at 34p per pair they are excellent value!

Algarde Valve starter kit

The Algarde Two-Way Gang Valve Starter Kit is made of green plastic and consists of an air input and two screw-controlled air outlets. All three accept standard-bore aquarium air-pump tubing. The Algarde Gang Valve Extension Kit consists of two additional screw-controlled air outlets, and slides and clips firmly onto the previously mentioned valve kit, thus providing four air outlets from one input. Obviously additional extension kits may be added to provide one with any number of required air outlets, each controlled by a screw. It is extremely easy to add to or subtract from the number of outlets; and the precision-made parts, fitted with 'O' rings to prevent air leakage, enable one to make accurate adjustments.

I operate four outside filters from one pump and these were supplied via a four-way gang valve set that I had had in continuous use for years. I decided to remove the old valve set and replace it with the Algarde unit joined into a four-way valve. I did so—and was astonished to discover that much more air from my pump actually reached the filters. It was as if I had replaced my pump with a stronger one. An examination of the old valve set showed me that the threads had become somewhat worn, the seals less than perfect, and the interior sections coated with a tar-like substance (which reminds me that I'm a smoker who has not smoked for two complete years today).

Each set of two Algarde gang valves is supplied with a handy little strip of adhesive pad for fixing it where required, e.g. on the side glass of an aquarium. One simply peels the backing strip from the adhesive pad and fixes it in place on the valve unit; after which the latter can be fixed in a suitable position. This is a useful little extra that enhances another excellent product from Algarde. If you operate two or more filters, aerators, etc. from one pump via a system of ageing valves, why not treat yourself to a new set for 42p or 84p. You too could find that your pump is producing rather more air than your present gang valves are delivering to your filters or aerators.

Time for a new scraper?

Having treated myself to a dozen new heater/thermostat holders put me in the mood to buy myself a replacement for the elderly aquarium-glass scraper that I bought so many years ago that I can recall neither where nor when. Recently I mentioned no longer being able to obtain the particular type of safety razor blades required by my old scraper. I bought myself an Algarde aquarium scraper at 70p; and spent 12p in a local chain store on a packet of five double-edged razor blades.

The Algarde scraper is about 1ft. 5 in. long, with a light metal shaft. The shaft has an appropriately-angled bend onto which is fitted the plastic head that holds the scraper. The scraper itself consists of two segments of flexible, blue plastic that clip together. A razor blade may be fitted between these scraper blades. The scraper may be used with the razor blade as the scraping edge; it is recommended for heavy scraping. The blue segments may be reversed in the head to conceal the razor blade edge and expose a soft, plastic edge for light scraping. I tried the unit first with a razor blade edge and found that it worked well. I then reversed it—and found that the plastic scraping edge was perfectly adequate to remove completely the very light growth of algae from the glass of the aquarium that I was cleaning. I imagine that I'll always find the plastic edge adequate for my needs as I don't leave my

tanks unattended long enough for heavy growths of algae to grow on the front glass.

The other end of the metal shaft is fitted with a cream plastic device with two little prongs that form a V shape. This device, I assume, could be used for stirring up the gravel in a tank, for poking things on the bottom of the tank, and, possibly, for planting plants, i.e. a planting stick. I tried to plant a couple of plants with it but did not find it very successful as a planting stick, if used alone, because it not only pushed the plant into the gravel but just as quickly pulled it up again as it was withdrawn. I found that this little fitting could be easily slipped off the metal shaft, if necessary, and just as easily refitted. But I bought the Algarde scraper to remove algae from the glass of my aquarium, and this it does well—with or without a razor blade, depending upon the strength of growth of the algae. I'll be happy to use my Algarde scraper and I consider it good value at only 70p.

Versatile Algarde Tongs

The Algarde 20 in. tongs cost £3.00 and Mr. Gardner sent me a pair to try out for myself. (A 28 in. model is available at £4.00.) The pair I received are made of grey plastic and are intended for use in acquaria, vivaria, terraria, etc. They are amazingly light, yet also tough and strong, as well as being hygienic.

The handle is moulded to fit the four fingers of one's hand, and there's a hanger hook provided should one wish to hang up the tongs when not in use. The working end of the tongs is fitted with a pair of extra-strong jaws with a sensitive grip. At the opposite end is an easy action press button which is easily operated by one's thumb when one's fingers and hand are round the handle of the tongs. The tongs work very well and one can become quite skilful after a little practice. I used the tongs to plant a variety of aquarium plants without too much difficulty—although, again, a second instrument, such as the planting-stick end of the scraper, was useful to scrape gravel round the base of a plant held in place by the tongs. Many other uses for the tongs could be found, e.g. removing the occasional dead fish from an aquarium, or removing dead plant leaves from the gravel surface. These useful tongs could be very helpful to those who grow house plants in bottle gardens.

There is no proper substitute for an immersed hand if one wants to work at gravel level in an aquarium and doesn't mind getting a wet arm (I always manage to soak my shirt sleeve as well!); but the Algarde tongs are as good a substitute as you are likely to get. They are well made, well designed, light in weight, yet tough. I can recommend these tongs to those who would find them useful—and that would include most aquarists other than those with bare glass tanks.

The Algarde 'Volcano'

The Algarde 'Volcano' is an aquarium decoration as well as a simple under-gravel filter. It looks like a child's idea of a volcano and is about 3½ in. high by about 6 in. in diameter. It is roughly funnel-shaped and is made of light plastic; the base of the volcanic 'mountain' is green, changing to dark brown, then light brown in colour near the top—the upper rim of the 'crater' being painted white. It is supplied with a small, flat, air diffuser (or an air stone may be used). The base of the 'volcano' is buried in the aquarium gravel to a depth of about ½ in., with the diffuser resting on top of the gravel inside. An attached air line is then fitted to an air pump and the air supply adjusted to 'low' for a large 'eruption' every few seconds.

The centre hole in the top of the 'volcano' is about ¼ in. in diameter. For maximum filtration the centre hole may be enlarged with a sharp knife to about 1 in. in diameter and the air input adjusted to 'high'.

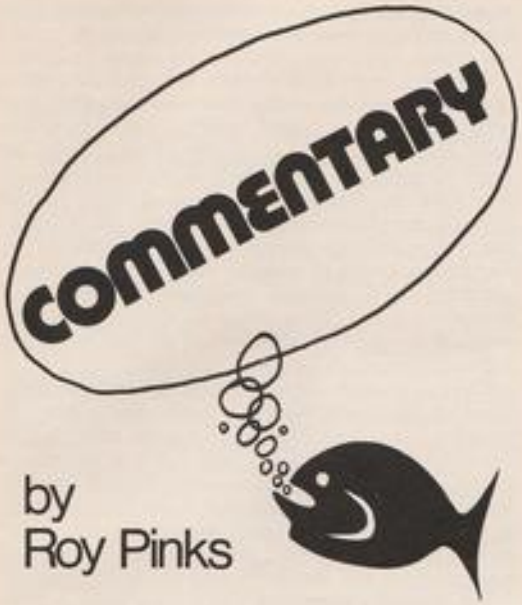
It would be easy to dismiss this item in an off-hand manner because I do not think the item would appeal to the serious aquarist; but to do so would be foolish. Obviously it was not designed for those of us who consider ourselves to be the sophisticated aquarists; it was designed for youngsters who like to add a bit of extra colour and excitement to their tank; and those who fit one will have the added advantage of under-gravel filtration in their tank as well. (The filter works on the inverted funnel idea—which was one of the earliest forms of under-gravel filtration.)

Although the 'volcano' is aimed at youngsters, I was most interested to learn that a large importer of tropical and marine fishes had just ordered a number of 'volcanos' for use in his fish house. After trying them (he wasn't over keen) he concluded that they are most effective and has decided to use them in his quarantine tanks.

It pleases me to be able to recommend these well-designed, British products as being good value for money; and I'm particularly pleased at having discovered the heater/thermostat holders. I wish I'd done so when they came onto the market in 1979.

No doubt readers are aware that Algarde Enterprises Ltd. make a wide range of other high-quality products for the aquarist.

B. Whiteside.



by
Roy Pinks

A MONTH OR SO AGO I saw an advertisement in 'New Scientist' from an organization at Ostend, Belgium, inviting applications from experienced and qualified candidates for research into fish pathology and the development of improved medications. It stated that the candidate would be expected to play an important part in the development of a major new sales programme to the aquaculture industry throughout Europe.

Many aquarists will read this with interest and, perhaps, a certain scepticism born of their own experience of medications commonly available in this country—at all events they will join me in wishing success to this enterprise, though they will hope that the conclusions reached will not all stem from mere laboratory and fields tests. The sadly disillusioned fishkeeper will certainly hope that he (the ultimate customer, presumably) is in some way associated with the development programme, because the product will succeed or fail according as to whether it is effectively operable in the hands of the idiot, the careless and the cautious. And of course it doesn't just end there. It must also be effective, or, at any rate, non-harmful, in the water conditions which might be expected to exist in a vast cross section of tank samplings. When one contemplates some of the truly terrible brews one has seen from time to time passing as aquarium water, the immensity of the task begins to unfold somewhat.

It is intensely depressing that no significant improvements have been made during the last 10 years, for example, in the treatment of White Spot. Dropsy still ends up with the death of the fish as a general rule, and even Velvet still reaps its toll, and more besides. This is not just criticism for the sake of it—it seems to be the general opinion that things are far from what they ought to be. At any rate, I quote an old hand who recently wrote to me, and whose views command much respect, who confessed that he was falling back on Halamid for White Spot as often as not, in preference to other formulations whose side effects, not mentioned in even the small print, were so grave as to be unacceptable. Halamid certainly has an excellent reputation but it is pretty long in the tooth and its producers make no extravagant claims as to its infallibility. So it's all rather sad that in 1981 we are still scratching around for something we can use with about 90% confidence. We must also try to see this from the point of view of the producer who honestly believes he has been handed a winner by his chemists. He has seen the results of controlled experiments, and his Magico does indeed cure the White Spot within 24 hours. But do his technical writers then let him down by producing a set of user instructions which fail to bridge the gap between him and the user. There are the instructions which wash off the bottle after the first outing. There are those which appear on the packet but not on the bottle, and which are immediately lost. Then there are those on a piece of tightly rolled paper screwed into the packet, which one throws away when it is removed. And many are intelligible just to scientists. This is quite a serious business, and perhaps poor communication is the basic reason why all the wonder cures don't

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Coldwater Jottings

by Frank W. Orme

THE END OF the year is fast approaching; for the coldwater fish keeper the month of December is, generally, the start of a period when there is little to exercise his or her interest in the aquatic sphere. The fish are no longer active and the plant life in the pond has died back, chilling temperatures tend to discourage messing around in the water and one can only wait impatiently for the return of the spring and the renewed life of the watery world in which our enthusiasm is rooted. Nevertheless the winter months do allow us time to sit back and reflect upon the successes or failures of the past season. We can dream in anticipation of next year's young fishes, as our thoughts range ahead to the possible matings that might produce that elusive perfect specimen. 'Perhaps if that nice young male were to be paired with his grandmother it might do the trick. Although he is not too well coloured he is a good type in other respects, and she has been a really good show-fish with good colour. Hmm, yes it could work, the pairing could result in some excellent young stock . . .', and so, in idle moments we let our thoughts drift. Of course, our dreams are seldom realised; reality seldom, if ever, lives up to the dream.

Whilst Dame Nature endeavours to frustrate us, by attempting to make the fish revert to its original form we, by exercising our skill and knowledge, work to thwart her intentions. By careful, selective breeding we not only preserve the fancy goldfish but do our utmost to improve it. By hard culling we reject those fish which show signs of obeying the dictates of nature and retain only those which conform to our own ideals of body shape, finnage and colour.

The percentage of worthwhile fish obtained from a spawning is invariably smaller than we would wish, but we persevere and make progress slowly. Unlike those who breed many other species of fish, the goldfish breeder can never be certain, or forecast with absolute accuracy, just how good the quality will be of young fancy goldfish produced from a spawning of any particular pair of fish, no matter how good the parents may be. The quality can vary from spawning to spawning and the disappointments are many. The continual anticipation, endeavour and frustration, always trying but never quite achieving our dream of the 'perfect' fish is part of the fascination that holds the enthusiast's interest in these fish.

There is no short cut to obtaining the ideal specimen. However, reasonably consistent results can be achieved provided that you are prepared to practice some form of line-breeding and establish a pure strain of the chosen variety. There is no profit in crossing different varieties, for this merely results in 'mongrels' which bring no credit to the breeder and does a grave disservice to any unsuspecting purchaser. A pure-bred spawning can produce many worthless fish, why deliberately add to the problem?

The newcomer to the hobby of keeping fancy goldfish is advised to obtain the best stock that can be afforded from an established, reputable breeder. Such goldfish as so-called Cambridge Blues, Comet-tailed Shubunkins and the like are not recognised varieties; Sarassa Comets—or Sarassa anything else—are merely metallic scaled fish that are coloured red and silver, Sarassa signifies a red and white colour pattern and nothing more, and such fish can, and do, arise amongst the young from all-red parents of the metallic type.

If it is decided to keep more than one variety choose totally dissimilar types. There would be no temptation, for instance, to cross-breed the shubunkin and the veiltail. The fish are so unlike in body shape and finnage that such a pairing would bring no improvement to the progeny. If, however, moors and veiltails were chosen there could be a temptation to cross them, in the belief that the young would be better coloured, and it might be that more blue appeared on some of the young, but this seeming improvement would be penalised by the young developing telescope type eyes, or carrying the genes for them. This would become apparent when the young were used for breeding, as their young would number many with the moor-like telescope eyes.

I repeat that on no account should the different goldfish varieties be crossed—especially if you wish to become known as a reliable breeder of fancy goldfish. Keep your breeding lines pure and with patience, and time, the results will come in the gradual improvement of the quality of the young produced, together with your reputation as a breeder of decent quality, pure-bred stock. Of course, if the stock is initially obtained from a well-known, established breeder you will commence with a 'flying start' by carrying on from the point he had reached and, no doubt,

many years will have been spent by the breeder in establishing the quality of the strain and raising it to the standard at which you are buying your start.

Tropical Koi

It causes me annoyance whenever I read statements to the effect that the fancy goldfish varieties are 'tropical fish' and must be kept in heated aquaria. No doubt koi enthusiasts will be very surprised to learn that their fish are also unsuitable for keeping in coldwater! I was recently shown a cutting, which I was told had been taken from the queries page of a newspaper. A writer wished to know why a number of koi had died after being placed into an outdoor pool. Apparently five fish had been purchased from a garden centre, "at considerable cost, and seemed to be quite active at the time. Each fish was approximately 3 inches long and displayed in a large glass aquarium, with other pond fishes"—the writer did not say what the other fishes were. "Upon arriving home they were put into the pool and immediately swam away; however, two days later one was found dead, and by the end of the week, the remainder were seen floating on the water surface and not one was alive." The rather startling reply was as follows: "Koi are native to Japan where, as will be appreciated, the temperatures are much higher than they are in our country. Such fish are unable to live in our harsher climate unless they can be accommodated in similar conditions to those of their native waters. Koi are a form of semi-tropical carp and should be kept in water which is maintained at a temperature of between 21°C and 23°C in a well planted aquarium where their bright colours can be seen to the best advantage. These fish are not really suitable for life in a pond, and your fish died because they were too cold." I have read some stupid things but this is one of the most ridiculous. Surely these people who deal with newspaper 'queries columns' can make some effort to get their facts right—after all, they do profess to be experts, despite usually having a cloak of anonymity.

Finally, I wish all readers a 'Happy Christmas' and a New Year that brings pleasure and success to your fish-keeping activities.

Discover the Fish **BY PISCES**

My first is in Hobby but not in Sport
My second is in Informed but not in Taught
My third is in Water but not in Pure
My fourth is in Prevention but not in Cure
My fifth is in Temperature and also in Heater
My sixth is in Yard and also in Metre
My seventh is in Loam but not in Peat
My eighth is in Nutrition but not in Meat
My ninth is in Fin but not in Tail
My last is in Gravid so not in Male

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work. But since most of them are based on malachite green—no great mystery, surely, I wonder it is that makes for such heavy going. It could be that producers have settled for a percentage of success, being unable or unwilling to produce really detailed instructions for a range of user types.

Whatever the answer to all this, there are many thousands of potential and willing contributors to any research project which set out to find out how they felt about it all, and what most they would like to see achieved.

Feeding Foibles

The tropical enthusiast seldom has any trouble in persuading his charges to feed—the merest appearance of the food container will usually spark off a flurry of pushing and shoving at the front of the tank; indeed, the absence of such excitement is a sure indicator that something is wrong. In fact, most fish in indoor aquaria will follow this sort of pattern, but the pondkeeper is confronted by such erratic feeding habits that he has to keep his wits about him if he is to avoid trouble.

The main danger is that he will overfeed, and although an excess of food will not prove disastrous in a large pool, there are lots of small prefabricated ponds around, and these are likely to become polluted very rapidly in hot weather if waste is allowed to accumulate. Many of us are too anxious at the beginning of the pond season to cram our fish with every sort of luxury obtainable—after all, they have just recovered from the cruel tests of winter, and are entitled to the best we can offer! This is all very well, but they will not in fact feel like much until the water temperature down below is 50°F or more, and even when they do begin to take nourishment, this will be a cautious and finicky process until the weather really warms up and remains consistently favourable. Between late May and early September pond fish will generally make a great fuss at feeding time, and once they have settled down they will usually regard the approach of the pondkeeper as the signal for food: a disappointing phenomenon, too, as often as not, as he is usually empty handed. But do watch for those periods when the wind gets round to north, and even though the sun is out, the fish will act nervously and reject all that we offer. It is interesting to conjecture just what causes these off periods. Perhaps it is a combination of atmospheric pressure and the language of the wind on the water. Fisherman will have their own pet theories, and they are worth listening to. At times like these it is best to leave the fish to their own devices and only return to the pellets or the tin of earthworms when they show their usual eagerness to leap from the water for their supper. It is sometimes worth remembering that chopped live food is usually more attractive to fish than if it were untreated. This is because fish have a keen sense of smell and are probably attracted by the rawness of the offering. It is interesting, too, to see how your fish react to being fed just at dusk, when you can only just see them. They do, in fact, behave just as though it were broad daylight, and, assuming that they are hungry, they will similarly remove everything you throw in, down to the tiniest speck.

Coldwater Queries

by Arthur Boarder

READERS SERVICE

Our experts are always pleased to receive your letters which should be addressed to: **Readers Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.**

All queries requiring a personal response **must** be accompanied by a stamped addressed envelope.

I have tried to rear fancy goldfish fry with *infusoria* but never seem to get much luck. Is there any way to raise fry without using *infusoria*?

There is no need to use cultivated *infusoria* these days as one can buy liquid feed for fry and dust fine fry food to follow. The trouble with *infusoria* feeding is that it is not always easy to ensure that the liquid feed has sufficient live creatures in it to be of much use. One should always have available a microscope of not more than about twenty-four magnification to examine the fluid before it is fed to the fry. A strongly magnifying microscope will only magnify one or two creatures but will not signify how many are present in a drop of water. Also most cultures of *infusoria* will soon become rather foul and this water added to a fry tank will not improve its condition. I only used *infusoria* once about forty-five years ago but the results were not very good but once I tried liquid fry food I used no other.

I have six tanks and intend to breed fancy goldfish. Can you give me any information on hand breeding?

I presume that you refer to hand spawning or stripping as it is termed. I do not recommend this method to breeders as there can be injury caused to the fish. I used this method as an experiment many years ago but I consider that it is not worth the chance of doing damage to the fish. The only time I would say that this method can be used is when several varieties of fancy goldfish are together in a pond and it is needed to breed true specimens from one variety. It is then possible to choose a pair and hand strip them. By this means one is sure to get true specimens like the parents.

In my opinion the safest way to use this method is to be certain that the fish to be used are ready or have already started to spawn. If one tries to force eggs from a fish when it is not ready to lay, then injury can be caused. Catch the required pair and have a bowl or tank ready filled with water and a few fine leaved plants. Hold the female in one hand with the belly uppermost and the head towards the wrist. With the thumb and finger of the other hand apply gentle pressure along the body from the head towards the vent. Eggs should stream out freely. Then do the same with the male and you should see the white milt flow from it into the water over the eggs. Do not return the pair back to the pond immediately but allow them time to recover in a spare tank.

I want to make a garden pond and wonder if I make it of concrete instead of a liner will it be safe for fishes. Also I can get plants from a nearby stream if you think them safe?

A concrete pond can be quite safe for fishes as long as it is prepared correctly. It takes a lot of hard work but can last as long as you need it. After two days of completion, fill with water and leave for another two days. Then empty and with the aid of a strong jet of water and a stiff broom, scrub well round the concrete. Empty and make sure there is no white sediment left on the bottom. Then repeat the process and the pond should be quite safe. Water plants from the wild may very well be a cheap way to stock a pond but it may be much dearer in the long run. There are so many parasites, pests and diseases which could be on the plants, especially in the form of eggs, that it is better to buy water plants from a clean stock so that you can make a good start.

The author of a book on goldfish states that he does not agree with fish exhibitions. Do you agree with this?

My view is just the opposite as I consider that exhibitions are the only way for a breeder of fancy goldfish to find out if he is breeding a true strain and if the quality of his fishes is up to standard. How else could he know whether his fishes have any faults which may not be evident to him as he sees them every day? A fresh opinion, as that of a judge, may be able to point out faults which he has not noticed. After all, most mothers think their daughters are beautiful. Some people suggest that those who exhibit are just 'pot hunters' but this is not so.

In October 1960, an aquarist bought a dozen good young fantails from me for £3. About a year later he sent me a very attractive plaque which he had won at an open show as first prize for one of the fish. He asked me to accept it as he thought I had more right to it as I had bred the fish. Certainly not the act of a 'pot hunter.'

Tropical Queries

by Dr. C. Andrews

I have recently bought an African Cichlid called a Cobalt Blue. Can you provide me with some information on this fish?

The fish you describe sound rather like the Cobalt Blue form of *Pseudotropheus zebra*, a rather aggressive and territorial Cichlid from Lake Malawi. It may be kept in a one-species tank, with plenty of rock work and tough leaved (or plastic) plants. The composition of the water does not seem critical although it should not be too soft. A temperature of 22-25°C. will suffice, and you should offer a good mixed diet based on a vegetable conditioning food. You may find the book "Rift Lake Cichlids" by G. Axelrod (T.F.H., about £1·00) interesting. By the way the address of the British Cichlid Association is c/o Mr. I. Sellick, Department of Zoology, Bristol University, Woodland Road, Bristol.

Can you send me some information on *Cichlasoma spilurum*?

This Cichlid comes from Central Africa and may reach 10 cm. in length. Young specimens are quite peaceful, although older individuals may become a little more aggressive. You should provide a large tank with a sandy bottom, and plenty of hiding places (logs, rocks etc.). This fish is not fussy over water quality conditions and the temperature should be around 24°C. Feed a varied diet based on good quality flaked foods, with some "safe' live foods.

I recently saw a fish called *Badis badis* in my local aquarium shop. Can you provide me with some information on this species?

This is a member of the family Nandidae, and comes from South East Asia. Males may reach 8 cm. in length, females a little smaller. It can be kept in a well planted community tank—so long as plenty of hiding places are present. Water quality conditions are not crucial, and a temperature around 25°C. should be fine. Feed a diet based on good quality flaked foods, plus occasional feeds on freeze-dried foods or "safe" live foods. This fish will even breed in a community tank; the young fish should be moved to a separate tank for rearing on infusoria, then newly hatched brineshrimp, followed by powered baby fish foods, and eventually the same foods as their parents.

Can you tell me where I might find some information on the use of anaesthetics on fish?

You should consult the following:

Jolly *et al.* (1972). Anaesthesia of Fish. *Veterinary Record*, October 28th, 424-426.

Larid and Oswald (1975). A note on the use of Benzocaine as a fish anaesthetic. *Journal of the Institute of Fisheries Management* 6, 92-94.

Ross and Geddes (1979). Sedation of warm-water fish species in aquaculture research. *Aquaculture* 16, 193-186.

These publications should be available from your local college library. Your local vet may also be able to offer some advice (see "Yellow Pages"), and an interesting booklet on MS 222 (a fish anaesthetic) used to be available from Thomson and Joseph Ltd., Castle House, Castle Meadow, Norwich.

How can I find out details of my local aquarist club?

Contact the following organisations, depending on which part of the country you live in:

Federation of British Aquarist Societies,
T. Butler,
17, Risborough Road,
Maidenhead,
Berks.

Federation of Northern Aquarist Societies,
B. Lawless,
9, Spruce Way,
Lawton,
Nr. Warrington.

Federation of Scottish Aquarist Societies,
Jean Boulter,
15, Coulter Avenue,
Wishaw,
Lancs.

Irish Federation of Aquatic Societies,
S. Mooney,
1, Carrickhill Road,
Port Marnock,
Co. Dublin.

Yorkshire Association of Aquarist Societies,
E. Stanton,
57, Medlock Crescent,
Handsworth,
Sheffield.

Do enclose a stamped addressed envelope when writing to these organisations.

Marine Queries

by Graham Cox

I set up a marine tank seven weeks ago. 3 U/G filters + 1 sander run on Whisper 1000. Temperature 77°F. Tank 36 in. × 18 in. × 18 in. S.G. 1.020. Lighting 1 Gro-Lux 30 watt, 1 Truelite power twist 30 watt—12 hours daily. Nitrite—25% water change each four weeks. In the tank I have:

(a) 1½ in. Cherub angel (1)
(b) 1½ in. Neon goby (2)
(c) 1 sm. red hermit crab (1)
(d) 5 shrimps (5)
(e) 1 thumb-sized anemone (1)

I would like to add in the future:

1 Cleaner shrimp
2 Dancing shrimp
1 Arrow crab
1 Murex snail
2 anemones
1 Mandarin dragonet

Will these be at peace with one another?
If I decided later on to add a clown would they live in peace together—if so, which is the least aggressive clown?

My hydrometer is a "Plus-Ultra". It is very clearly marked but does not read the same as my little hydrometer which are the small ones sold in most shops. Which hydrometer would you choose for accuracy?

Yes you could safely add all the additional invertebrates and the Mandarin you mention.

The least aggressive of all the Clownfishes (genus *Amphiprion*) is the Pink Skunk Clownfish (*A. perideraion*), the next least aggressive is the Orange Skunk Clownfish (*A. akallopsis*) and the third least aggressive is the Common Clownfish (*A. percula*). A mated pair of any of these three fishes would be ideal within the community listed above.

"The least aggressive of all the clownfishes is *A. perideraion*—the Pink Skunk Clownfish."

You should trust the reading of the "Plus-Ultra" above all hydrometers. It is the standard reference instrument used by marine biology units in Universities throughout Britain and most other parts of the world. Every year I get at least a dozen cases to investigate of total marine aquarium "wipe-outs" which prove to be due to nothing other than outrageously high or low salinities caused by hobbyists having tried to save a few coppers by buying cheap foreign hydrometers. I strongly advise you either to take the little hydrometer back to the shop where purchased and politely ask for a refund or smash it at once and write the loss off to experience.

One last word of warning; in view of your intention to buy one or two clownfishes later on, I advise that you amend your purchase list to only *one* (1) anemone because you will need the long-tentacled purple-stemmed *Radianthus* anemone from Sri Lanka—the favourite home for all the clownfishes *BUT* rather large.

I would be grateful for any advice on the following subjects:

(1) I recently purchased a Moray eel. He is approx 15 in. in length, with a light brown background covered with a jigsaw shaped white or greyish mottled appearance, I have not had any luck in trying to identify him. Unlike most Morays he is out nearly all of the time, particularly when I am moving around the room feeding my other fishes. The chap I got him off told me he used to feed him on large goldfish or any large fishes that had died in his tanks. I would like to get him on raw meat or similar but at the moment he takes it very reluctantly. I suppose he has got used to live food. Could you please tell me how often he should be fed and what the Moray eel tolerance to pH, nitrite & nitrate, is, taking into consideration the large amount of meat he can consume at a go. He can be particularly nasty during such times as I "hoover" the bottom. He has grabbed the plastic tube and wrenched it all over the tank. The tank he is in is 36 in. × 18 in. × 18 in. with a selection of coral in the corner for hiding places.

(2) One of my marine tanks containing a large Emperor angel has a lovely growth of algae growing on the coral decor and also on the bottom crushed shell. What I would like to ask you is:
When I stir up the crushed shell to remove some of the sea humus during a partial water change, what effect will the algae have on the tank conditions in general? If it is buried beneath clean coral-sand which has been brought up whilst "stirring" the bottom, will it deteriorate and cause any problems?

(3) I have recently seen on display in one of my local shops some small barracuda. They were approx 7 in. in length and about six of them were swimming in a shoal. For anybody with

a spare tank 36 in. × 15 in. × 18 in. and wanting something unusual, what do you think of them from a professional point of view?

(1) *Moray eel.* I advise that you only feed this fish on marine-derived *gamma-ray irradiated* sea-foods, e.g. Silverfish, cockle, mussel, squid-chunks, etc. Although many specimens will learn to feed on small chunks of mammalian flesh such as steak, liver and so on, I'm far from convinced that such a bizarre diet is good for them in the long run, although there is of course no disease risk from such foods. With regard to the feeding of diseased or moribund F/W and S/W fishes, *I most strongly* advise you against this in the health interests of the other tank occupants. You see, although sharks, groupers, dragonfish, moray eels and

"Sharks, groupers, dragonfishes, moray eels and other marine predators have gastro-intestinal enzyme secretions which would destroy a "Trident" class submarine in under 48 hours. . . ."

other marine predators have gastro-intestinal digestive juices which would destroy a "Trident" class submarine in under 48 hours, the other fishes in your tank have not and might easily forage some of these doom-laden morsels from the messy moray's mouth.

With regard to amounts of food, all predators tend to eat relatively large meals but relatively rarely. This does not worry them metabolically however. You will have no doubt noticed that all the afore-mentioned marine predators (*except the pelagic sharks*), are exceptionally lazy creatures, lying quietly under their caves or ledges waiting for a dozy, senile or sick fish to swim past their mouths. Only then do they exert themselves to lunge forwards and devour the hapless victim. Thus two silver-fish (*irradiated* —remember?) per week is adequate food for your eel. Obviously don't stock any fishes smaller than this fish's outstretched jaws in this tank—nor in your barracuda tank (if you get it) for that matter? If you do you won't have the small fellows for long. Almost all these marine predators hunt at night and you'll find that damsels, and clowns and suchlike vanish every few nights.

"Obviously, don't stock any fishes smaller than the moray's outstretched jaws—nor in your barracuda tank either."

In a 36 in. × 18 in. × 18 in. (42 gallons or 190 litres gross capacity) tank, the pH should not deteriorate too rapidly with the recommended 25% partial water change every month. Similarly, there should never be any free nitrite provided that a fully-matured, *average* 4 in. (10cms) depth, cockle-shell (one-third) and oolitic coral-sand (two-thirds) filter-bed with two 1 in. diameter (2·5cms dia.) airlifts are running full blast 24 hours every day. *Nitrates* on the other hand will tend to accummulate. There is no bacterial way of preventing this in *any* closed-circuit marisystem, but your monthly 25% water change should prevent accumulations in excess of 50ppm (= 50mgm/litre) which is perfectly safe for a beast as tough as a moray eel.

(2) *Buried algae.* Please don't worry about this. It happens to all my tanks—(including my ultra-sensitive octopus and squid tanks) every time I remove sea-humus from the coral-sand layer of the filter-bed (i.e. every 28 days average).

What happens is that the algae buried under the coral-sand cannot photosynthesise and so break down within 48 hours to release all their trace-elements and nutrients back into the seawater. This then produces growth of new algae within 72 hours.

(3) *Barracuda.* These pelagic and uninteresting fishes fill a similar ecological niche in the oceans as the salmonids (trout, grayling etc.) pike and pike-perch do in European stretches of freshwater, *provided that you remember that the Indo-Pacific SPP grow to over six* (6!) *feet long and don't transfer them to a larger tank you should be safe.* In your 36 in. tank I don't think they will exceed 9 in. (23cms) in length, though they do grow with amazing rapidity. I once grew a 2 in. (5cm) specimen up to 12 in. in a 72 in. sea aquarium in only 4 months.

"Always remember that the *nitrate* content of tropical oceanic seawater *never* exceeds 0·5ppm as nitrate."

One final word of caution here. Please remember that Barracuda are *pelagic* (i.e. open seawater) predators and that the *nitrate* content of oceanic tropical seawater *never* exceeds 0·5ppm as nitrate (NO_3). You therefore must be religiously regular in your partial seawater changes if you ever expect to see them at their best.

Discover the Fish

Answer: Bitterling

Siamese Fighters
Part three

"...and in the blue corner..."

by Martin G. Briscoe

IN GENERAL my experience with blue fighters seem to indicate that they are very aggressive, but should two males accidentally get together and fight, such contest ceases momentarily to enable each to gulp air from the surface—hence the title to this piece. In this respect they seem most courteous to each other and fascinating to watch providing that they are not left together long enough to cause mutual damage. I have however raised some of a blue-turquoise colour which are about four months old (they hatched in mid-December). I hope the success rate with these will be more satisfactory. Our low success rate with blues leads me to the question of whether the inter-breeding is such a good idea and whether bad hereditary factors are being brought to the fore. I have had a pair in a 2 ft. × 12 in. × 15 in. tank and have achieved nothing more than them playing 'tag' behind the filter. Whether these bought fish have been confined to a depth of 5 in.-6 in. of water and I have then introduced them into a water depth of 12 in.-15 in. and thus upset their nest building instinct remains to be seen. All my own bred fish have built fine nests in 12 in.- 15 in. of water.

I have witnessed some strange incidents. One male 'cuddled' the female on the bottom of the tank for three days but nothing further developed in their activities. No nest was built and both became aggressive though the female showed her ovipositor throughout as though quite ready for breeding. The temperature in the tank was maintained at a steady 80°F. The male had a considerable amount of blue flecking on its body and in the finnage and because the success rate with blue fighters has been lower, we are now back to the question of whether or not females of the species have an aversion to the colour blue. We did purchase a gold/brown fleck male who was the most aggressive we ever had. He killed six females without once constructing a nest. Whether similar aggression is shown in the 'Libby' fighters bred in America, we cannot say as we have not come across them in England, but perhaps a fellow aquarist reading this article may be in a position to help us obtain such a specimen.

Incidentally, my success rate has been higher at 76°F than at the rigid 80°F favoured by commercial breeders. I am now coming to the conclusion that the seasons have an effect on fighters' instincts as we have had more nests built and eggs successfully raised in December and October than in Summer or even Spring. Whether this is a throw-back to their natural habitat and climate I cannot yet say. If, during the summer I get the opportunity and the climatic conditions to allow this, I shall try a system of 'solar' as opposed to artificial heating to sort out this instinct barrier. A summer similar to that which we enjoyed in 1976 would be ideal and we will report on our findings at a later date. I shall soon start to plant my individual tanks, as also mentioned in my second article and will share my experiences in this regard too.

I have recently started varying the diet on which I raise my fighters. In the very beginning I still feed Liquifry but after a time I introduce white worms which I culture myself and which seem to give a faster growth rate. I also feed Tubifex cleaned and prepared as previously described. White worms can be removed from the culture with a wooden skewer or small cane which must be pointed and then introduced into the tank or jar. The way in which the fish attack and remove these worms provides an insight possibly into their natural quest for food from canals or dykes in which they live in their native lands and is fascinating to watch. They even jump out of the water in their efforts to reach the food if this is held just above the water level. If, however, the cane or skewer is lowered into the water, the young males will display themselves to their full magnificence. Adult males were very apprehensive when I first introduced white worms to their diet but I found that by feeding these daily they soon decided that the worms were food. Whether it was the colour of the worms that deterred them I cannot say as they have always eaten blood worms without any trouble. I started one month old baby fighters on small white worms which were eaten with relish. Once started on this food, they will continue to accept it to adult size.

The Exhibition Hall at Belle Vue, Manchester, where the British Aquarists' Festival was staged

A HISTORY OF BAF

1951-1980

DUE TO FOOD, clothes, petrol, etc, being rationed in the early post war years, lots of people were frustrated, many finding relief in the form of the aquatic hobby. This being one of the few things readily available without having to queue with ration book in hand.

At the end of 1946 Aquarist Societies, particularly in the North of England were, erupting like mushrooms, and Charles Graham, the then secretary of Leeds A.S. thought it might be a good idea to form a Northern Federation which would be advantageous to an expanding hobby.

The premier society of the north in 1946 was Belle Vue A.S. so Mr. C. Graham drove over to Manchester to discuss his idea with Dr. J. F. Wilkinson, Gerald Iles, the late Tom Lee and other members of Belle Vue A.S. committee.

From the first and subsequent meetings the Federation of Northern Aquarium Societies was formed, on the 7th June 1947. The founder members being aquarist societies from Belle Vue, Derby, East Lancashire, Halifax, Leeds, Merseyside and Sheffield.

The F.N.A.S. held two assemblies each year with guest speakers and afternoon teas. The assemblies were organised by Mr. Gerald Iles the zoological superintendent of Belle Vue Zoo and secretary to the F.N.A.S. It was soon realised that the majority of people attending these assemblies, over 1,000 on occasions, were not really interested in the meetings, but mainly came to see the fish in the Zoo's aquarium, so the Federation arranged for a full one day Inter-society Show for the autumn of 1950 at Belle Vue. The premises at Belle Vue could not have been obtained had it not been for the help of Gerald Iles. The Assembly was addressed by Mr. Mogens Hojgard, director of the Copenhagen Aquarium.

EXECUTIVE COUNCIL
B.A.F. 1951

Dr. G. F. Wilkinson, M.Sc., Ph.D., M.D., President F.N.A.S.

Charles Graham, Treasurer F.N.A.S.

Gerald Iles, Zoological Superintendent of Belle Vue and Secretary of the F.N.A.S.

There was great enthusiasm in the north, during the planning stages of the show, and Mr. Bob Charman, Managing Director of Buckley Press Ltd. and close associate of the late Mr. A. E. Hodge (founder of *The Aquarist*) during the latter part of the 1920s, realised the potentials and, contacted Dr. Wilkinson the F.N.A.S. president to discuss the possibilities of a sponsored prestige Open Show at Belle Vue in 1951 in co-operation with the F.N.A.S. This was finalised at a small meeting in January 1951 and the British Aquarists' Festival was born. The Festival was to be directed by an Executive Council to consist of Mr. Bob Charman, Mr. Jim Butler, Mr. Anthony Evans, and Mr. Fraser Brunner, representing the sponsors (*The Aquarist*) and Dr. Wilkinson, Mr. Iles and Mr. Graham of the F.N.A.S. After weeks of planning and preparation the first B.A.F. was held on 2-5th May 1961.

W. W. Charman, Managing Director, Buckley Press Ltd.

J. Butler, Advertising Manager, *Aquarist*

Anthony Evans, Editor *Aquarist*

Fraser Brunner, Consultant Editor

The Executive Council appointed an Organising Committee consisting of members of the F.N.A.S. to be responsible for carrying out arrangements at the Manchester end, with special responsibility for staging and stewarding the show. For the competitive exhibits Mr. R. O. B. List was appointed Show Secretary and Mr. C. Graham chief steward with Mr. George W. Cooke as his assistant. In all, over 60 officials and stewards were milling around ensuring all was in order and running smoothly.

The sponsors (*Aquarist*) supplied 360 show tanks for Tropical fishes and hired carpenters and show-fitters to erect stands for society members to display their fish. Additional tanks, heaters and all essential equipment were brought from far afield. Robert Helpman, famous in the world of Ballet and theatre opened the show. Over 17,000 people visited the show including many famous aquarists from overseas.

The show from the public point of view was a fantastic success but alas, in spite of all the planning, enthusiasm, and unpaid effort it was a financial disaster. The cost of materials, transportation and hired assistance had far exceeded the income and the sponsors were left with a bill of four figures.

Over 1,000 Aquarists at F.N.A.S. Assembly

At the Spring Assembly of the Federation of Northern Aquarium Societies the largest attendance of society members yet recorded at one meeting in this country gathered together, on Sunday, 6th May. The Festival was open only to the Assembly on this day, and from 10 a.m. to 4.30 p.m., with a break for lunch, members toured the Exhibition Hall. After tea they assembled in the Belle Vue Ballroom to hear an address from the F.N.A.S. President, Dr. J. F. Wilkinson, reports by the treasurer and secretary. Official presentation of trophies took place before these proceedings.

In his address Dr. Wilkinson thanked donors of trophies and prizes on behalf of the Federation. He recalled how the Federation had arisen from the Belle Vue Society, which before the last war had staged an exhibition in Manchester that had proved extremely popular. The B.A.F. was an undoubted success from the hobby publicity point of view, he said, and he expressed the hope that it would be the forerunner of other co-operative efforts between *The Aquarist* and the Federation. Dr. Wilkinson foresaw the growth of similar ventures on an international scale, with aquarists from all countries meeting at various large centres in turn.

British Aquarists' Festival, Belle Vue, 1951

Over a Thousand Entries Displayed

MANY people have said that the British Aquarists' Festival, held last month at Manchester, marks an important point in the history of British aquarium interest. It was the largest exhibition ever put on in these islands, solely for aquarists. It was the first time a show of any magnitude has been held away from London. The fine support it received indicates that there is a true desire for such events to take place on a national scale, and the public interest manifested that our hobby is in the most active phase of its growth. Over 17,000 people visited the B.A.F. during 2nd to 5th May, and now that it has been demonstrated that aquarists living some distance from an exhibition venue can make entries without personally accompanying their stocks it appears likely that future endeavours of this kind will need to be on an increasingly larger scale.

Organised by the Federation of Northern Aquarium Societies and sponsored by *The Aquarist*, the B.A.F. was officially opened at the Exhibition Hall, Belle Vue, by Mr. Robert Helpmann. In introducing this leading British exponent of ballet, Dr. J. F. Wilkinson, President of the Federation, said at the opening ceremony that the main aim of the Festival was to publicise the extent and scope of the hobby and scientific study of fish-keeping and aquatic interests in this country and specially in the north of England. Particularly, he stressed, was it hoped to give help to schools and school children, and Dr. Wilkinson mentioned the valuable addition that an aquarium can be in the children's wards of hospitals. It was also an aim of the Festival to give help to *The Aquarist*'s Hospital Aquarium Fund.

Before the Opening

Setting up and receiving entries commenced on the Sunday before the opening day, and as so often seems to be the case on these occasions, operations were hampered for a time by a most unseasonal fall in temperature accompanying some snow. Heating facilities were soon incremented by stewards, however, and by the following morning, and, in fact, for the remaining period the fishes were staged, one of the main problems was to keep temperatures in the tanks down, rather than up! The railway arrivals of fishes at Manchester on Sunday and Monday were according to plan and as several aquarists experienced at fish-showing remarked, the preparations were singularly free from the bustle and confusion that is often taken as an insurmountable preliminary to these events.

Judging commenced on the day before opening to the public and was completed the following morning. Over a thousand entries in the 86 classes were made, and the variety of species shown in the tropical section surprised many visitors. The fishes exhibited by breeders revealed the good work that a number of aquarists in the north have been carrying out, unbeknown to their southern brothers!

New Standard of Staging

The impressive row of furnished tropical aquaria was an exhibit of special delight for the public; these, one thought, were what these visitors wanted to see—how an aquarium can be made to look really decorative in the home. Some novel ideas were tried out, but did not tempt the judges on

Presentation of a corner bow-fronted tropical aquarium to Mr Robert Helpmann by Mr W W Charman (left), Festival Director, and Dr J F Wilkinson, FNAS President

this occasion. The tanks were all hooded and screened, and placed at eye-level, as was all other staging.

Traders who had stands at the B.A.F. combined to put on a display that was quite the equal of any trade exhibition to be seen at leading exhibition halls and the variety of their stocks was indicative of the thought and care that is put to supplying the needs of aquarists these days. Together with the special displays of water gardens, biological exhibits, cacti, reptiles and amphibia and the regularly given film shows and talks, all this added up to a show of which the F.N.A.S. can be justly proud. *The Aquarist* shares in this pride, and can look forward to the future with the certain knowledge that the valuable experience of this Festival can lead to bigger and better things.

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Festival Message
from HERMANN MEINKEN

Distinguished German aquarist visitor to the B.A.F.

I AM very glad that I was able to see the wonderful British Aquarists' Festival, and I must express my great thanks to all my friends in England, especially to Dr. J. F. Wilkinson, President of the Federation of Northern Aquarium Societies, to my old friend Mr. A. Fraser-Brunner, and to *The Aquarist* which made it possible for me to attend this event.

I was asked to convey the most kind wishes of the President of the Federation of German Aquarium Societies, Dr. K. Kramer, for a successful Festival and to offer also the best regards of the President and members of the Bremen Aquarium Societies. In Germany our opinion is that the success of an exhibition is measured by the numbers of new members of societies and new readers of aquarium journals obtained, rather than by the monetary profits.

I know that this view is also that of British aquarists and it is our hope that this Festival will be followed by an effort to bring about a close international co-operation between European Federations. In writing of co-operation I think of an exchange of monthly news bulletins, aquarium journals articles concerning original research work, perhaps of fishes and plants too, and of exchange visits by aquarists to exhibitions in different countries.

With regard to the British Aquarists' Festival I can but repeat what I have already said—it was the best show I have ever seen in Europe. Especially was I struck by the idea of showing fishes in small individual tanks apart from beautiful furnished aquaria, so that each visitor may easily choose the species he most wants to keep, and then see and obtain advice from the catalogue on how they may be kept; these were quite new features to me.

I regret very much that other German aquarists were not able to see this really grand Festival and that I was forced to return to Germany before the final day of the F.N.A.S. Assembly.

Thanks to advance planning and efficient reception the arrangement by which fishes were forwarded to Belle Vue by rail from various parts of the country proved highly successful. Insulated cans and large thermos flasks were used as travelling fish containers and one aquarist, Mr. H. S. White, of East London, sent a specially made large wooden box, double-walled for heat conservation, containing his entries in carefully packed glass jars.

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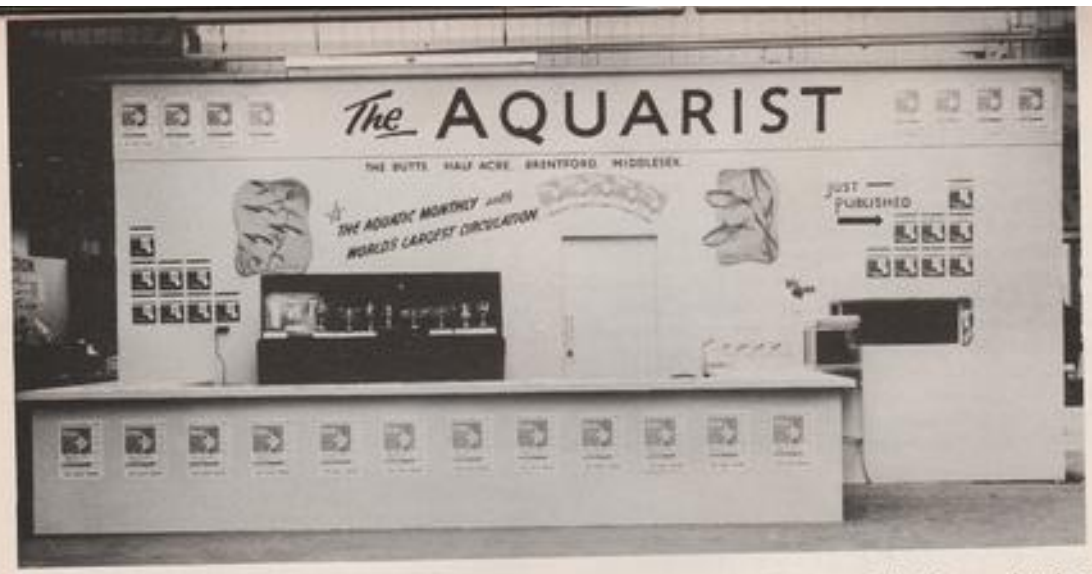
A popular exhibit that was unfortunately short-lived was a young octopus, obtained by Mr. Gerald T. Iles from Plymouth for the B.A.F. In the living state, in his aquarium, and later as a preserved exhibit "Oswald" was eagerly sought out by the 5,000 school children who visited the Festival in parties organised by their schools. Their visits were often planned to provide a little extra-mural natural history study, such as the biology class of the Castle Hill County Secondary Boys' School, who has been issued with typewritten questionnaires to fill in during their tour of the exhibition. This practical idea ensured that the boys made observations for themselves and also that they asked questions of the stewards who acted as their guides.

London Water taken to Manchester

HIGHLIGHT of the Sunday before the opening of the B.A.F. was the arrival of a party of Hendon Aquatic Society members with their entries. They unloaded these from a conspicuously labelled large van, revealing fish cans bearing the legend "Hendon is Here," and uncomplimentary to Manchester's Water Board, large carboys with labels "Mature London Water." Prominently displaying their club badge on white jackets these enthusiastic aquarists set up their furnished aquarium and distributed their individual fish and plant entries. Several awards went back to Hendon with them on their return journey the following week-end and their happy co-operation in the Festival will long be remembered.

Members of the Hendon AS unloading their exhibits after their arrival at Manchester in the placarded van



Display stand of "The Aquarist" (picture above) on which the BAF trophies were exhibited, was placed centrally and formed a break between tropical and coldwater sections of the Exhibition Souvenir catalogues, magazines, books and booklets were on sale

Members of a young audience deeply absorbed in one of the film shows provided free for visitors in the cinema adjacent to the show's tropical section are shown on the left

Pictures of the Exhibition Hall on these pages, were taken immediately prior to the official opening before crowds made it impossible to do so. Part of the coldwater section is shown below. Shubunkin breeder, Mr G Handley of Hartlepools AS in the picture was given a post-judging view of the entries

British Aquarists' Festival 1951

in pictures

General view (above) the tropical section and main bank of traders stands seen from "The Aquarist's" stand shows the hooded and eye-level display of small aquaria

Mrs W Charman, representing the Buckley Press Ltd, publishers of "The Aquarist," handling the "Daily Dispatch" trophy for the best fish in the show to its winner, Mr R R Brough, during the presentation ceremony at the FNAS Assembly on 6th May

Mr R Skipper of Hendon AS (right, above picture) is seen receiving "The Aquarist" trophy from the Editor of "The Aquarist" for the best exhibit in the water plants section

The coldwater section was brightened by a colourful pond and water-garden arranged by members of the Southport AS (pictured left). Part of the run of tropical furnished aquaria is seen on the right

The fishes that travelled the longest distance to Manchester were some cichlids that accompanied Mr. J. Alexander from B.A.O.R., Germany. Mr. Alexander made the B.A.F. his first stopping place to set up a furnished aquarium entry on his way home to Scotland on his first leave for two years. The thirty-hour journey was not made without difficulties. Before the trip was made Ministry of Agriculture and Fisheries permission had been secured to bring in the fish and water plants; fishes that normally lived together quite peaceably nibbled one another's fins in the close confines of cans; unheated trains added to temperature maintenance troubles and the long spell in darkness did not improve the plants. Mr. Alexander was awarded a special prize in token of his meritorious entry.

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Farthest travelled visitor to the B.A.F. was an *Aquarist* reader from Nairobi—Mr. S. McKnight, who was greatly impressed by what he saw. He told us of the delights of keeping tropicals at home in garden ponds and of freedom from worries about tank heating. Two of our oldest readers also made themselves known to us—Mr. C. E. Duce of Preston and Mr. L. Portway of Sheffield (who also successfully entered some fine fishes), friends of our founder Editor. We were pleased to meet Mr. and Mrs. V. Collier, who flew over from Ulster to see the show, and to renew friendship with Mr. Strachan Kerr from Glasgow and aquarists from Torquay and Cardiff.

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Plenty of time was available before the opening day for judging to take place and thanks are due to the F.B.A.S. judges who travelled up from the south—Messrs. J. Carnell, C. W. G. Creed, H. P. Lymn, R. G. Mealand, W. G. Phillips and M. Welch. Together with the F.N.A.S. Judges, Messrs. H. Loder and G. T. Iles, their decisions were speedily yet unhurriedly made. Mr. Phillips, the noted guppy specialist, who has been an aquarist for fifty-six years, thought the B.A.F. to be the finest fish show he had seen anywhere; he praised the eye-level staging of hooded tanks and the organisers' provision that judges could withold awards when standards were not considered to be reached.

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A first-class display of biological interest—water animal and plant life of all forms—was made on the stand of the Manchester Microscopical Society, and members of the Society on the stand were kept very busy answering questions and giving demonstrations to visitors. Mr. C. Birtwell had arranged a named collection of nearly twenty native water plants and a fine display of mosses and lichens suitable for vivarium use. The northern section of the British Herpetological Society also staged a comprehensive exhibition of reptiles and amphibia, also some African lung fishes. A non-competitive row of aquaria showing British fishes including trout, pike, carp, bream, perch, tench, chub and orfe by Mr. E. Chapman of Sheffield Aquarists' Society drew much appreciative comment.

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Film shows of aquatic and herpetological interest, six a day, were very popular, as were talks given by Messrs. G. T. Iles, A. Boarder, A. Fraser-Brunner and R.O.B. List. The Exhibition Hall's broadcasting system, in the capable charge of Mr. Chadwick, was an invaluable administrative help, and announcements of new arrivals at the show, of "happy events" in the livebearers' tanks and of spawnings were made regularly. Several species spawned in their exhibition tanks during the B.A.F., indicating that conditions were quite satisfactory for the fishes!

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Thanks of *The Aquarist* and publishers, sponsors of the B.A.F., are due to many individuals and clubs for their interest and work in making the event a success. The following are among those who bore the brunt of the hard work of stewarding a busy show and of keeping a night watch on exhibits:—Mr. C. Graham (Chief steward); **Belle Vue Aquarist Society**, Messrs. A. Westbrook, H. Hall, C. J. Westbrook, W. S. Tracey, E. Ratcliffe, D. Ratcliffe, H. J. Paynting, A. Pella, B. Dickinson, C. K. Wilson, J. Crassly, T. Bentley, Mrs. Bentley, Mr. and Mrs. G. Thompson, Messrs. W. Pearson, R. Broughton, J. I. Traynor, A. F. Elton; **Salford Aquarist Society**, Messrs. E. McDowell, K. Iwill, G. Rankin, D. D. Pendlebury, T. Bowden, A. Spencer, G. Poyser, L. Gregory, R. Kershaw; Mrs. C. Hammond, Mrs. E. Chapman, Mrs. Ledger. To these and to officials of the F.N.A.S. and all the other members who gave their enthusiastic support, our grateful thanks.

Judging Results and Awards

FBAS judges at "The Aquarist's" stand. Left to right: Messrs M Welch, C W Creed, H P Lymn, W G Phillips and R G Mealand

Awards

Section A.—Furnished Aquaria

Class 1. Club Tropical Aquaria: 1st—Blackpool and Fylde Aquatic Society; 2nd—Bradford and District A.S.; 3rd—Hendon and District A.S.; V.H.C.—Sheffield and District A.S.; H.C.—Leeds and District A.S.; C.—Preston Scientific S.

Class 2. Club Coldwater Aquaria: 1st—Nottingham and District A.S.; 2nd—Hendon and District A.S.; 3rd—Nelson and District A.

Classes 3 and 4. Individual Furnished Aquaria: 1st—D. McC. Pullon; 2nd—(Mrs.) M. Thompson; 3rd—R. E. Legge; V.H.C.—R. Borrowdale; H.C.—H. Charles; C.—(Mrs.) B. Robertshaw.

Classes 5 and 6. Junior Furnished Aquaria: 1st—N. S. Young (Hands Trophy Winner); 2nd—B. Pengilley; 3rd—W. Parker; V.H.C.—D. Townsend; H.C.—R. K. Pawson; C.—A. R. Edgar.

Best Furnished Aquarium, Section A: Blackpool and Fylde Aquatic Society's entry; awarded Cussons Trophy. The aquarium displayed a small shoal of *Hyphessobrycon serpae*.

Section B.—Coldwater Fishes

Classes 7 and 8. Common Goldfishes: 1st—M. R. Price; 2nd—R. F. Singleton; 3rd—S. G. Wingrove; V.H.C.—S. Coldbeck; H.C.—T. S. Pick; C.—P. R. Chapman.

Class 9. Shubunkins: 1st and 2nd—A. R. Sutton (Leeds Aquarists' Society Trophy Winner); 3rd—H. W. Pollard; V.H.C.—H. North; H.C.—R. Hyatt; C.—H. Truman.

Classes 10 and 11. Fantail Goldfishes: 1st—W. Butler; 2nd—H. W. Pollard.

Classes 12 and 13. Veiltail Goldfishes: 1st—Z. Webb (Goldfish Society of Great Britain Trophy Winner); 2nd and 3rd—N. L. Smith; V.H.C.—W. Butler; H.C.—Z. Webb; C.—W. Butler.

Class 14. Moors: 1st—Z. Webb; 2nd—W. Butler; 3rd—R. F. Singleton.

Class 15. Orandas, lionhead, celestial, etc. No awards.

Class 16. American sunfishes and bass: 1st and 2nd—J. Stott; 3rd—R. Hyatt.

Class 19. Perch, pike and A.O.V.: 1st—No award; 2nd—J. A. Holloway; 3rd—G. H. Winder.

Best Coldwater Fish, Section B: Veiltail goldfish (Z. Webb), awarded Belle Vue Ltd. Trophy.

Section C.—Guppies

Class 20. Colortail (male): 1st—G. M. Challens; 2nd—B. Jowett; 3rd—D. Cannon.

Class 21. Pintail (male): 1st—No award; 2nd—H. S. White.

Class 23. Bottomsword (male): 1st—D. Johnson; 2nd and 3rd—H. S. White.

Class 24. Doublesword (male): 1st, 2nd and 3rd—J. P. Keene.

Classes 25 and 26. Lyretail and roundtail (male): 1st, 2nd and 3rd—H. S. White.

Class 27. Robson (male): 1st—No award; 2nd—H. S. White.

Class 29. Female (coloured): 1st—No award; 2nd and 3rd—G. M. Challens.

Class 30. Female (plain): 1st—No award; 2nd—D. Cannon; 3rd—No award.

Most outstanding guppy. Section C: Doublesword male (J. P. Keene) awarded Guppy Breeders' Society Trophy.

Section D.—Livebearers (pairs of fishes other than guppies)

Classes 31 and 32. Shortfinned molly: 1st—W. L. Mandeville; 2nd—R. Metcalfe.

Classes 33 and 34. Broadfinned molly: 1st, 2nd and 3rd—W. R. Smith; V.H.C.—A. H. Bland.

Classes 35, 36, 37 and 38. Platy: 1st—A. J. Rushley; 2nd—C. Graham; 3rd—S. Talbot; V.H.C.—W. L. Mandeville.

Classes 39, 40, 41 and 42. Swordtail: 1st—R. R. Brough (*Daily Dispatch* Trophy for Best Fish Winner); 2nd—H. Walch; 3rd—D. Collinwood; V.H.C.—J. Southworth.

Class 43. Platy variatus: 1st—J. H. East; 2nd—M. C. McAfee; 3rd—R. F. Singleton.

Class 44. Other livebearers: 1st—R. Skipper (*Phallocerus caudomaculatus*); 2nd—A. Sunderland; 3rd—D. Cannon (*Girardinus metallicus*); V.H.C.—B. Pengilly (American guppy).

Best livebearers. Section D: Tuxedo swordtails (R. R. Brough), awarded Fraser-Brunner Trophy.

Section E.—Small Egglayers (pairs)

Class 45. Rosy barb (*Barbus conchonius*): 1st—H. Charles; 2nd—E. W. Padon; 3rd—F. Bentley; V.H.C.—G. N. Hadley; H.C.—B. Jowett; C.—C. H. Westbrook.

Class 46. Tiger and ruby barbs (*B. terrazona, partipentazona, nigrofasciatus*): 1st—W. Sharp (*B. nigrofasciatus*); 2nd—J. H. East (tiger barb); 3rd—G. Mollard (tiger barb); V.H.C.—M. Hipperson (*B. nigrofasciatus*); H.C.—W. Tait (*B. nigrofasciatus*); C.—J. Wilde (tiger barb).

Class 47. Other barbs: 1st—L. Portway (clown barb); 2nd—S. Davies (*B. fasciolatus* (schuberti); 3rd—(Mrs.) M. Thompson (cherry barb); V.H.C. & C.—W. Sharp (cherry and checkered barbs).

Class 48. *Rasbora* species: 1st—G. Mollard (scissor-tail); 2nd—(Mrs.) B. Robertshaw (*Rasbora* sp.); 3rd—L. Portway (*R. urophthalma*).

Class 50. *Hyphessobrycon* species: 1st—G. W. Cooke (rosy tetra); 2nd—R. Borrowdale (serpa tetra); 3rd—L. Portway (*H. pulchripinnis*); V.H.C.—A. Grant (neon fish); H.C.—S. Rice (Belgian flag tetra); C.—E. L. Calver (glowlight tetra).

Class 51. *Hemigrammus* species: 1st—L. Portway (beautiful tetra); 2nd—D. Rogers; 3rd—T. S. Hobday (beacon fish); V.H.C.—S. Talbot; H.C.—A. J. Rushley (beacon fish); C.—W. L. Mandeville (beacon fish).

Class 52. *Nannostomus* species: 1st—N. Bell (margined prim fish); 2nd—M. C. McAfee (pencil fish); 3rd—E. Shaw (margined prim fish); V.H.C.—J. H. East (*Nannostomus* sp.); H.C.—L. Portway (prim fish); C.—(Mrs.) K. Anness (prim fish).

An attractive rock garden and pool designed by Mr C Graham of the FNAS in the coldwater section

Class 53. Other characins: 1st—W. L. Mandeville (black widow); 2nd—R. Skipper; 3rd—A. Jackson (black widow); V.H.C.—J. L. Traynor (Congo characin); H.C.—R. Skipper; C.—W. Smith (hatchet fish)

Class 54. Zebra fish: 1st—H. Loder; 2nd—D. Cannon (*Danio devarioi*); 3rd—H. Loder; V.H.C.—E. Watson; H.C.—L. Heeson; C.—G. Bennett (giant danio).

Class 55. White cloud minnows: 1st—H. Hall; 2nd—L. Heeson; 3rd—F. Bickerdike.

Class 56. Loach: 1st—L. Sunsburg; 2nd—J. Bond.

Classes 57 and 58. Catfishes: 1st—H. Hall (*Corydoras*); 2nd—A. J. Bland; 3rd—R. Skipper (*Corydoras*); V.H.C.—H. W. Pollard (*Corydoras*); H.C.—R. F. W. Bowman (*Corydoras*); C.—(Mrs.) K. Anness (*Corydoras paleatus*).

Class 59 and 60. Toothed-carps: 1st—B. Calrow (striped panchax); 2nd—L. H. East (*Aplocheilus*); 3rd—L. Heeson (Cuban ribulus); V.H.C.—H. S. White (Cuban rivulus); H.C.—H. Loder (striped panchax).

Class 61. Glass fish, etc.: 1st—N. Bell (rainbow fish); 2nd—J. Bond (sandfish); 3rd—W. Tait (rainbow fish).

Best egglayers. Section E: Ruby barbs (W. Sharp), awarded *The Aquarist and Pondkeeper* Trophy.

Section F.—Labyrinth Fishes

Class 62. Paradise fish: 1st—A. J. Bland; 2nd—B. Greenwood; 3rd—H. Loder; V.H.C.—E. Ryan.

Classes 63, 64 and 65. Gouramies: 1st—R. Borrowdale (pearl gourami); 2nd—C. B. Higginson (blue gourami); 3rd and V.H.C.—W. R. Burwell; H.C.—H. Loder.

Classes 66, 67 and 68. Gouramies: 1st—A. Allison (dwarf gourami); 2nd—S. Streets (thick-lipped gourami); 3rd—W. L. Mandeville; V.H.C.—R. F. Singleton (dwarf gourami); H.C.—E. W. Badon (dwarf gourami); C.—W. L. Mandeville.

Class 69. Fighting fish: 1st and 2nd—A. Bray (Bland Trophy Winner); 3rd—G. M. Hadley; V.H.C.—H. S. White.

Class 70. Fighting fish, cambodia variety: 1st—H. Hall; 2nd—No award.

Best Labyrinth fish. Section F: Pearl gourami (R. Borrowdale), awarded Federation of Northern Aquarium Societies Trophy.

Section G.—Cichlid Fishes

Class 71. Acaras, etc.: 1st—G. H. Phillips (blue acara); 2nd—W. R. Burwell (brown acara); 3rd—W. L. Mandeville (blue acara); V.H.C.—G. H. Phillips (blue acara); H.C.—A. J. Bland (marbled cichlid); C.—(Mrs.) B. R. Mills (marbled cichlid).

Class 72. Chanchito, Jack Dempsey, etc.: 1st—W. Butler (Jack Dempsey fish); 2nd—L. Heeson (*Cichlasoma festivum*); 3rd—A. J. Bland (firemouth cichlid); V.H.C.—D. Cannon (*Cichlasoma nigrofasciatum*); H.C.—J. Beaumont (*C. nigrofasciatum*); C.—R. K. Pawson (Jack Dempsey fish).

Class 73. Mouthbreeders: 1st—B. Cheshire (African sp.); 2nd—L. Portway (Egyptian sp.).

Class 74. Angel fish: 1st—D. Collinwood (Whitwell & Smykals Trophy Winner); 2nd—G. Mollard; 3rd—F. Bentley; V.H.C.—D. Rogers; H.C.—Messrs. Bates and East; C.—T. C. Farrell.

Class 75. Other cichlids: 1st—L. Heeson (dwarf cichlid); 2nd—G. P. Burwell (dwarf cichlid); 3rd—B. Cheshire (*Geophagus brasiliensis*); V.H.C.—(Mrs.) M. Beaumont (*Hemichromis fasciatus*); H.C.—A. J. Bland (pike cichlid); C.—B. Pengilley.

Best cichlid fish. Section G: Dwarf cichlid (L. Heeson), awarded National Aquarists' Society Trophy.

Section H.—Breeders' Classes (teams of six fishes)

Class 76. Goldfish: 1st—E. S. Walker; 2nd—W. Butler; 3rd—H. North; V.H.C.—R. F. Singleton; H.C.—E. S. Walker; C.—No award.

Class 77. Other coldwater fish: 1st—H. North (golden orfe, bred 16th April, 1950); 2nd—No award.

Class 78. Small egglayers: 1st—G. W. Cooke (glass fish, bred 25th September, 1950), (East Lancs. Society Trophy Winner); 2nd—Messrs. Bates and East (lyretails, bred 3rd January, 1951); 3rd—J. H. East; V.H.C.—J. Alred (harlequins, bred September, 1950, and rosy tetra, bred November, 1950); H.C.—(Mrs.) B. Robertshaw (glowlight tetras); H.C.—G. W. Cooke (harlequins, bred 6th September, 1950); C.—Messrs. Bates and East (lyretails, bred 2nd February, 1951); C.—Z. Fic (neon fishes, bred 25th October, 1950).

Class 79. Livebearers: 1st—J. Walch (red-eyed swordtails, bred August, 1950); 2nd—H. S. White (homozawed guppies, bred January, 1949); 3rd—V. Fletcher (lemon wagtail platys, bred 24th December, 1950); V.H.C.—L. Heeson (guppies); H.C.—No award.

Class 80. Labyrinth fishes: 1st—W. R. Burwell (pearl gouramies, bred August, 1950); 2nd—(Mrs.) M. Thompson (dwarf gouramies, bred 16th November, 1950); 3rd—No award.

Class 81. Cichlid fishes: 1st—H. Loder (angel fishes, bred December, 1950); 2nd—J. Alred (angel fishes, bred 12th February, 1951); 3rd—(Mrs.) K. Annese (angel fishes, bred 9th February, 1951).

Best breeder's effort. Section H: Glass fishes, bred 25th September, 1950 (G. W. Cooke), awarded Federation of British Aquatic Societies Shield.

Section I.—Plants

Class 83. Coldwater plants: 1st and 2nd—A. Snow (*Myriophyllum* and *Sagittaria*); 3rd—R. Hyatt.

Class 84. Tropical plants: 1st—R. Skipper (red *Myriophyllum*); 2nd—R. Skipper (Cabomba); 3rd—L. Heeson (*Cryptocoryne*); V.H.C. and H.C.—E. Chapman; C.—R. F. W. Bowman (*Ambulia*).

Class 85. 1st—G. Mollard (Amazon Sword Plant).

Best water plant. Section J: Red *Myriophyllum* (R. Skipper awarded *The Aquarist and Pondkeeper* Trophy.

Special Prizes

Good support was given to the B.A.F. by traders and others who kindly donated the following special prizes: One cash prize of five guineas, two of two guineas and one of one guinea (Federation of Northern Aquarium Societies); 24 ins. by 12 ins. by 12 ins. aquarium (Urmston and District Aquarium Society); "Hydro" single piston air pump (Mr. and Mrs. C. Hammond, Doncaster); six "A.1" thermostats (Angel Electrical Industries, London); cash prize of two guineas (Baldry's, Accrington); copper oil-heating lamp (P. J. Bryant, Bristol); three "Elephant" thermostats (Evans Electronic Developments Ltd., Birmingham); six copies *Right Way to Keep Pet Fish* (Fish Tanks Ltd., London); ten vouchers, each valued 10/- (W. T. Jefferies, London); fish-house jar and cartons "Meco" fish food (K. T. Aquaria, London); cartons "Coral" fish food (Liverine Ltd., Grimsby); "Jaynor" de luxe air pump (James North, London); voucher, value 7/6 (Wm. Owen & Sons, St. Helens); four vouchers, each valued one guinea (St. Martins Aquaria, London); "Reliable" thermostat (Joseph Sankey Ltd., Birmingham); "Little Wizard" thermostat (The Little Aquarium, Derby); two thermostats, one heater Sherwood Pet Stores, Sidcup); two "Ha-Ha" thermostats, two "Ha-Ha" heaters, two "Ha-Ha" thermometers, two "Ha-Ha" aerators (Singleton Bros. (Instruments) Ltd., London); two "Constat" thermostats (South Western Aquarists, London); two "Angel" heaters, one copy *Exotic Aquarium Fishes* (Waddington's Pet Stores, Brighouse).

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Arrival of a consignment of iguanas for Robert Jackson by air at Manchester's Ringway Airport was announced on the second day of the B.A.F., and they were delivered to the stand of this trader in the presence of a large crowd of visitors. An oak aquarium, shown on Mr. Jackson's stand, labelled "Sold to Winston Churchill," attracted attention of visitors—an order received the day before the B.A.F. opening.

Show Secretary's Report

ALTHOUGH the B.A.F. was held in the north, I was pleased to see that not all the awards remained there. London aquarists were well represented and have been rewarded for their pains. The general opinion was that most of the fishes were not quite up to southern standards, but those that were good were indeed good. This was evidenced by requests from best known breeders in London for some of the progeny of the very fine pair of Wiesbaden swordtails which too the *Daily Dispatch* Trophy for the best fish in the show.

The spade work of preparation and stewarding was done with boundless enthusiasm and helped considerably, and for the organisers was one of the great features of the show. Rail despatch exhibits were dealt with in a fine manner and no fishes were lost, either in transit or by neglect. This opens up an entirely new vista for show secretaries in general. A good point to use as an illustration is the fact that fishes from Torquay went back to their owner together with the awards won by him; excuses by aquarists that they haven't the time to bring their fishes to a show can no longer be valid.

Our distinguished visitors returned home full of admiration for the aquarists who were represented at the B.A.F. I take this opportunity of thanking all those who so ably supported me in my work as show secretary.

R. O. B. List

Members of the audience deeply absorbed in one of the film shows provided free for visitors in the cinema

Wartime equipment of all kinds has found various peacetime uses, and one unexpected adaptation of the frogman's diving gear was disclosed by Mr. Jordan of Aquafern, who exhibited at the B.A.F. Men equipped with this apparatus are used to collect the marine animal *Sertularia*, the skeleton of which is sold as a spawning medium and aquarium decoration.

1952
The GANG

1952. Mrs Peggy Hammond talking to Harold Hall with Charles Graham (extreme left) and Edgar Chapman (extreme right)

Finish it! They did.

A prominent man once said: "Genius is everywhere—but the kind of genius that will carry an idea to its finish is as rare as snow in June."

1952

Despite the loss sustained in 1951 Mr. Charman Managing Director of Buckley Press Ltd publishers of the *Aquarist and Pondkeeper*, expressed his wish that the B.A.F. should continue, but the expense must be trimmed. With a grant and printing and publicity provided free by the *Aquarist and Pondkeeper* the 2nd B.A.F. was put into gear.

The organising committee for 1952 was C. Graham (Festival Organiser), G. W. Cooke (Show Secretary), H. Hall (Chief Steward), F. Bentley, E. Chapman, Mrs. P. D. Hammond, T. R. Lee, H. Loder. There also existed a ladies' committee who helped with the day to day running of the show. The team or 'gang' as they called themselves, were extremely cost conscious, this and the hard work that followed created a jovial atmosphere amongst the workers, to quote C. Graham "the camaraderie among these early pioneers, and the urge to get things done without argument cannot be described in print."

With voluntary help mainly from members of Belle Vue society the 'gang' slogged for days erecting stands on Belle Vue's dining tables, with lots of heavy cardboard sheeting supplied by C. Graham, who out of character from his profession guillotined it all in the evenings "without a union card". They filled tanks by what seemed miles of leaking hoses, working every night into the wee small hours with aching backs, sore feet and frozen fingers. Edgar Chapman could always be seen in his businesslike overalls, checking and re-checking the electrical wiring he had supplied and installed. Over 700 tanks had to be borrowed, these were collected from all over the country by courtesy of Mr. Hall and his drivers. Due to bad road conditions and the inadequate shock absorbers of those days many of the tanks did not withstand the journey and had to be repaired. For some of the ladies' committee this was nearly a full time job, hard at it through most of the night, knee deep in water and putty.

Once again the festival was a great success, and because of the massive saving on the expenses, actually realised a small profit.

ENTRIES for this year's British Aquarists' Festival, have exceeded last year's record figure, and it is estimated that there will be 3,000 fishes on show. Fishes are being sent from as far south as Torquay and from Scotland in the north.

The assembly of the Federation of Northern Aquarium Societies will be held on Sunday, 12th October, and the main event will be a 'Brains Trust" with Messrs. A. Boarder, J. Carnell, C. Creed, R. Mealand and W. Phillips (F.B.A.S. judges) as its members, and Mr. G. T. Iles as question-master.

Special printed sheets giving names, popular and scientific, and countries of origin of aquarium fishes for tank labelling will be used.

Educational authorities in the north have arranged for parties of school-children to visit the Festival during the week, encouraged by the tremendous enthusiasm which last year's B.A.F. fostered. One visitor to the B.A.F. will be Mr. S. McKnight, who will be flying to Britain by jet airliner "Comet" from Nairobi.

Breeders' tropical entries have doubled last year's figure and many of the rarer species of fishes will be displayed. Over 600 fishes make up two of the classes alone. St. Martin's Aquaria of London have donated a Challenge Trophy to be awarded this year.

Book Reviews

Popular Tropical Aquarium Plants *by W. Vivian De Thabrew, M.A., Ph.D.* Thornhill Press, Cheltenham. Price £8·00 or £9·00 (inc. post and pack) from the Buckley Press, The Butts, Half Acre, Brentford, Middlesex.

It is important to note that, Mr. Vivian De Thabrew's experience as a horticulturist goes back many years. Again he comes from a family that has had a lot to do with plants and botanical matters in his native Sri Lanka. But this is not all—not nearly all. For the last few decades, Mr. De Thabrew has devoted his professional and well-practised skills to the propagation of tropical aquarium plants. His book is a joy to read after perusing so many books on aquarium subjects written by careless and apparently uncaring writers whose knowledge leaves much to be desired.

Mr. De Thabrew debunks the well-aired and oft-quoted notion that the use of an undergravel filter is detrimental to the growth of rooted plants. Providing the depth of the planting medium is right (about 3½–4 in. over the filter plates) non-faddy species suited to growing in the submerged state almost always romp away given the right sort of water (slightly acidic to neutral) and the right sort of light.

The author details several rooting mediums for the choosy or more finical plants. For example: the correct proportions of clay, grit, pea gravel, peat, leaf mould or loam or both, to achieve the best results. Any specially made up medium should be spread thin over the floor of the tank before the filter plates are introduced. Alternatively, the plates overlaying the specially prepared growing medium can be covered with a sheet of non-toxic plastic gauze with about 1/16 in. perforations. Over this fine-mesh screen spread a suitable thickness of well-washed inert grit. There are some interesting observations about the temperature requirements of various plants in cultivation today. For instance, plants from Malayasia, Indonesia, Indo-China, East Africa and South America usually require a high temperature. On the other hand, plants from India, Sri Lanka and Bangladesh get along better at a slightly lower temperature. Mr. De Thabrew draws attention to the fact that species from lowland areas vary in their needs from those occurring in highland areas. Yet most water plants—true water plants from the tropics—are remarkably adaptable. It is wise though to bear in mind the fish when planting up an aquarium. Take the ubiquitous White Cloud Mountain minnow. Or again, the Blind Cave Fish from the subterranean caves of southern Mexico. These two species are neither comfortable nor long-lived in the high temperatures enjoyed by the beautiful *Rasbora heteromorpha* or the splendidly dark-banded *Barbus hexazona*. Hair Grass (*Eleocharis acicularis*), *Vallisneria spiralis*, *Vesicularia dubyana* and *Cryptocoryne nevellii* flourish well in the lower sixties to low seventies (°F). Hence it follows that these are the sort of plants to introduce into a tank housing fishes that occur in nature in cool mountain streams or waters so overhung with vegetation that they do not reach a so-called tropical temperature. The neon tetra, for instance, is quite at home in water no warmer than 68 to 72°F (24°C).

The reader will find much valuable information on such matters as lighting, the correct method to plant a plant, the necessity to cut out dying and dead vegetation in order to preserve a wholesome environment, propagation of plants by vegetative means and by seeds, and there's expert advice about dividing nymphaeas, nuphars, acorus and similar tuberous or rhizomatous-rooted plants.

A following section of the book deals with the classification of plants according to growth pattern. That is to say, plants that float free or send down roots that anchor themselves in the compost. Then there are the numerous plants that root in the bottom soil and produce leaves at the base in the form of a rosette. There is a useful key in which plants are arranged in columns under bold type captions: *Family*, *Genus*, *Species* and *Common Name*.

An invaluable feature of the book is a guide to the pronounciation of the scientific names. The part of the text which concerns cultivation, habitat, special requirements and so on is very well done. Plenty of faithful line drawings and reproductions of black and white photographs adorn the text. The remaining seven pages of this 200-page hardback book are given over to a *Quick Reference Table* and *Recommended Reading*, with an additional list of books for specialized study. There is a two-and-a-quarter page index. There are also a few misspellings. But they are so few and far between that, all in all, Mr. De Thabrew is to be congratulated on producing such a useful work. Your reviewer hopes it enjoys a wide circulation and sale.

Jack Hems

News from Aquarists' Societies

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

SOUTH EAST

SIXTY-TWO people attended the October meeting of the **East Kent Aquatic Study Group** at St. Barts Hall, Herne Bay, Kent, on the second Tuesday of the month. All present enjoyed a talk by Colin Panel on the subject of Sharks and Loaches he illustrated his talk with slides he had taken when visiting fish shows around the country. Colin's wife, Joan, judged the evening's Table Show which attracted twenty-eight entries and was for pairs of fish. There were three classes which resulted:— Livebearers: 1, J. Edwards; 2, P. Scarr; 3, C. J. Bridgeman; 4, G. Newers. Egglayers: 1, C. J. Bridgeman; 2, and 3, R. Mathews; 4, R. George. Coldwater: 1, C. J. Bridgeman; 2, P. Saxby. The recent visit to London Zoo was much enjoyed by the 45 members who attended, especially the behind the scenes view of the aquarium to see the quarantine and breeding tanks and the extensive filtration plant. Membership of this society now stands at seventy-six and continues to grow in both numbers and enthusiasm, and they will make welcome any person who may care to pay a visit.

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THE **British Marine Aquarist's Association (B.M.A.A.)** has undergone many changes recently in both officers and format to give a much better and specialist service to its members. For the modest sum of £8.00 you can subscribe to the Bi-monthly unique journal "Mariners" written by marine aquarists for marine aquarists. Subscriptions should be sent to Membership Secretary, Terry Condra, 15 Turnpike Lane, Uxbridge, Middlesex. Please enclose s.a.e. if membership card is required. For more information send a large s.a.e. to Keith Moyle, Public Relations Officer, B.M.A.A., 9 Chatham Road, Hartlepool, Cleveland.

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AT the October meeting at Ockley Lodge, Keymer, **Mid Sussex A.S.** held a table show for classes T. DB. DZ. XBM. Also Mr Adrian Blake gave an F.B.A.S. tape and slide lecture A.O.S Livebearers. T: 1, and 2, J. Smith; 3, S. Smith (junior); 4, P. Levine. DB: 1, T. Wren; 2, E. Perrin. DZ: 1, 2, and 3, R. Perren; 4, S. Smith. XBM: 1, P. Levine; 2, 3, and 4, T. Pidgley. Meeting held every 2nd Thursday of each Month at Ockley Lodge, Ockley Lane Keymer at 8 p.m. Any enquiries to secretary J. Smith, 19 Eastbourne Road, Brighton BN2 4DL. Tel: BTN 602407.

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THE **Newham Aquarists & Reptiles Society** held their a.g.m. at Lathom Road School, East Ham, London on 21st October. Officers for the coming year are: chairman, P. W. Chapman; vice-chairman, T. Laberum; secretary, N. Johnson; treasurer, (Mrs.) J. Johnson; F.B.A.S. Delegate, (Mrs.) A. Chapman; P.R.O., (Mrs.) A. Chapman. Meetings are held at Lathom Road School, East Ham, London E.6, on the 1st and 3rd Wednesday of each month. New members and visitors are welcome for further details please contact: Norman Johnson (Hon. Secretary), 58, Leigh Road, East Ham, London E.6.

Bethnal Green & Independent A.S. Open Show held on 18th October. Results: Class Ag: 1, P. Mills (Walthamstow); 2, Mrs. E. A. Stallwood (Newbury); 3, A. Waller (Bethnal Green); 4, R. Brett (Croydon). Ak: 1 and 3, P. Mills; 2, D. Watts (Walthamstow). B: 1, A. Waller; 2, J. Edwards (East Kent A.S.G.); 3, B. Sayers (Brighton); 4, C. Richards (Sudbury). Ca: 1, Mrs. E. Davies (Corby); 2, C. Hogan (East Dulwich); 3, D. Winder (East Dulwich); 4, Mrs. P. Edwards (East Kent A.S.G.). Cb: 1, Mrs. E. Davies; 2, P. Whiddett (Tonbridge); 3, B. Sayers; 4, F. Scarr (East Kent A.S.G.). Cz: 1, B. Witteridge (Sudbury); 2, W. Hastings (South East London); 3, A. Pilbeam (Ashford); 4, Mr. and Mrs. J. Carney (Bethnal Green). Db: 1, Mrs. D. Winder (East Dulwich); 2, G. Stepnowe (Rom. and Bec.); 3, J. Rowney (Bexleyheath); 4, Mr. and Mrs. C. Brook (Croydon). Dc: 1, D. Foley (Bethnal Green); 2, R. Scotting (Ashford); 3, J. Partt (Rom. and Bec.); 4, A. Linds (Bedford). Dz: 1, R. Scotting; 2, J. Rowney; 3, W. Hastings; 4, M. Wright (Kettering). Ea: 1, C. Finnies (Strood); 2, Mrs. D. Winder; 3, C. Richards (Sudbury); 4, M. and B. Coe (Wellingborough). Eb: 1, B. Witteridge; 2, Mrs. E. Davies; 3, D. Foley; 4, Mr. and Mrs. J. Carney. Ez: 1, C. Richards; 2, H. Johnson (Bexleyheath); 3, Mr. and Mrs. J. Carney; 4, C. Finnies. F: 1 and 3, B. Witteridge; 2, H. Johnson; 4, P. Scarr. Ga: 1, P. Lambert (FBAS Championship Club Winner); 2, C. Finnies; 3, J. Wood (ELAPA); 4, D. Cruickshank (CAGE). Gz: 1, J. Edwards; 2, K. Graves (Ashford); 3, H. Johnson; 4, C. Richards. H: 1 and 4, H. Johnson; 2, Mrs. J. Farrell (Bethnal Green); 3, J. Adams (Rom. and Bec.). J: 1 and 3, Mrs. E. Davies; 2, W. Hastings; 4, A. L. Feast (Tonbridge). K: 1, Mrs. D. Winder; 2 and 4, T. Laughlan (Haringey); 3, P. Mills. L: 1 and 4, D. Winder; 2, C. Hogan (East Dulwich); 3, C. Richards. M: 1, J. Partt (Rom. and Bec.); 2, J. Rowney; 3, Mrs. W. Haines (Uxbridge); 4, B. Witteridge. Nb-m: 1, Mrs. E. Davies; 2, D. Foley; 3, T. Laughlan; 4, Miss C. Smith (Riverside). Nn-t: 1, P. Mills; 2, W. Hastings; 3, E. J. Dixon (Bedford); 4, C. Finnies. O: 1 and 2, T. Labrum (Newham); 3, Mrs. E. Stallwood (Newbury); 4, T. Laughlan. P: 1, A. Waller (Bethnal Green); 2, Mrs. E. Stallwood; 3, C. Richards; 4, A. Brown (Bedford). Q: 1, E. J. Dixon (Bedford); 2, R. Walsh (Sudbury); 3 and 4, Mr. and Mrs. J. Carney. R: 1, E. J. Dixon; 2, W. Hastings; 3, R. Scotting (Ashford); 4, Mrs. P. Edwards (East Kent). S: 1 and 3, Mr. and Mrs. J. Carney; 2, R. Scotting; 4, G. Stepnowe. T: 1, B. Witteridge; 2, P. Mills; 3, F. Scarr; 4, S. Fursedon (Walthamstow). U: 1, R. Shiner (GSOS); 2, 3 and 4, Mrs. S. Brown (Bethnal Green). V: 1, 2, 3 and 4, R. Shiner. W: 1 and 4, P. Mills; 2, J. Illingford (Dor.); 3, G. Stepnowe. Xb-m: 1, Mrs. W. Haines (Uxbridge); 2 and 4, F. Scarr; 3, G. Owen (Orpington). Xn-r: 1, S. Fursedons; 2 and 4, P. Mills; 3, F. Scarr. Z: 1, G. Smith (Walthamstow); 2, W. Woodward (Bexleyheath); 3, P. Mills; 4, Mrs. E. Stallwood. B-W (Juniors): 1, A. Waller; 2 and 4, Miss Karen Pitt (Rom. and Bec.); 3, W. Haines (Uxbridge). Xu-w: 1 and 2, Mrs. S. Brown. Total number of entries: 587.

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Romford and Beaconstree A.S. held their a.g.m. at St. Augustin's Church Hall, Birbeck Road, Rush Green, Romford, and the following Committee were elected:—Chairman, J. Partt; Secretary, M. Smith; Treasurer, E. Ward; Show Secretary, G. Stepnowe; Asst. Show Secretary, J. Adams; Programme Officer, Mrs. M. Partt; Social Secretary; P. Prior, Junior Members, A. Sewell; Lay Members, B. Compton, J. Pitt, and J. Fowler. The society meets on alternate Thursdays and new members and visitors are welcome.

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TUESDAY 20th October was the date for this years **South Park Aquatic (Study) Society** Bring and Buy evening.

This popular function was very well attended by numerous Bargain Hunters, with many old and new friends joining the regular S.P.A.S.S. members in bidding for the lots on offer in a lively atmosphere.

Sustained only by Glasses of water, auctioneer Gerry Herring sold a wide variety of goods which included fish such as quality pom-poms, comets, Shubunkins and young English Bred Koi, rare copies of Water Life Magazines, Pond and House plants, books, spawning mats, etc. Plus a quantity of non-fishkeeping products.

Full details of S.P.A.S.S. available from Mrs. Margarete Dudley, 163, South Park Road, Wimbledon, London S.W.19 8RX (Tel. 01-540 5662). The Society specialises in Coldwater Fishkeeping and meets at 8.00 p.m. on the third Tuesday of every month at the Wimbledon Community Centre, St. George's Road, London S.W.19. New members and visitors always welcome.

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AT the A.G.M. of **Kingston and District A.S.** the officers elected were: Mr. Dan Cotnee (Chairman); Mr. Mike West (Vice-Chairman); Mrs. Wendy Thornley (Secretary); Mrs. Jean Ellis (Treasurer); Mr. Dave Mackay (Show Secretary); Mr. Brian West (Assistant Show Secretary); and Mr. Alan Fuller (Trophy Secretary). New members and visitors to the club are always welcome. Meetings are held on the first and third Thursday every month at 8 p.m. at Raynes Park Methodist Church Hall, Worple Road, Raynes Park, S.W.20. Further details are available Alan Fuller (Tel: 01-397 4849).

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CLASS winners at **Walthamstow and District A.S.** Open Show held on October 11th were:— Class AA.B: D. Goodbody (WDAS); AG: Mrs. E. A. Stallwood (Newbury); AK: D. Watts (WDAS); B: A. L. Feast (Tonbridge); CA: C. Richards (Sudbury); C: B. Witteridge (Sudbury); DB: Mrs. D. Winder (E. Dulwich); D: D. Heeman (Harlow); Ea: C. Richards; E: H. Johnson (Bexleyheath); F: C. Cheveright (SLADAS); G: J. Edwards (EKASG); H: C. Richards; J: B. Hastings (SBLAS); K: Mrs. D. Winder; L: B. Thoday (Witham); M: B. Hastings; NBM: M. Darsley (E. Dulwich); NOT: S. Fursedons (WDAS); O: T. Labirum (Newham); P: A. Waller (BGIAS); Q: F. Holding (WDAS); R: B. Hastings; S: A. Morch (Witham); T: B. Hastings; U: P. Whiddett (Tonbridge); V: C. Brown (BGIAS); W: B. Thoday (Witham); XBM: P. Scarr (EKASG); XOT: S. Fursedons; XUW: B. Cook (WDAS); ZA: G. Smith (WDAS); ZBC: Mrs. E. A. Stallwood (Newbury). Best Fish in Show, (DB) Mrs. D. Winder. F.B.A.S. Trophy (NOT) S. Fursedons. Highest Pointed Society, E. Dulwich.

SOUTH WEST

THE October meeting of the **Gloucester A.S.** was held at the Chequers Bridge Centre, Gloucester. A talk on "Filters and Filtration" was given by Mr. T. Tapping, who brought along a range of equipment, from simple corner and poly-filters to power filters. The use of a variety of filter media and its effect on the aquarium environment was explained. Such was the interest shown that the meeting over-ran by half an hour. The Society will be holding a Jumble Sale at Minsterworth, Gloucester on 28th November. Results of the October Table Show: 1, S. Clegg (Slender Rasbora); 2, A. Frost (Elegant Rasbora); 3, P. King (Harlequin); 4, C. Sparey (Scissortail). Meetings are held the first Tuesday of each month at the Chequers Bridge Centre, Gloucester.

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FOLLOWING THEIR RECENT a.g.m. the **North Avon A.S.** has elected Chairman, C. Spence; Treasurer, N. Curry; Secretary, Mrs. C. Curry, 12 Linnet Close, Patchway, Bristol, Avon.

MIDLANDS AND WALES

THE **Association of Midland Goldfish Keepers** enjoyed an excellent meeting, when they met at the Foleshill Community Centre, Coventry to hear Messrs. Bill Ramsden and Brian Rothwell give their talks. Mr. Ramsden recalled his early days as a goldfish keeper, and recounted some amusing experiences when he worked in a pet shop. The proprietor sold many types of animals, apart from fishes, and once asked his assistant to exercise a young Puma by walking it around the premises. With some trepidation the young Mr. Ramsden managed to place a collar and leash upon the ailation-size cat before removing it from its cage. From then on it became a debatable point as to just who exercised who—much to the amusement of the AMGK members. Slides of some fine examples of fancy goldfish accompanied the talk given by Mr. Rothwell who adroitly managed to involve his audience in a discussion of the various aspects of producing good stock, while explaining his own methods. The visit of these two gentlemen, who are both members of the Northern Goldfish and Pondkeepers Society and travelled to Coventry from Lancashire, proved to be a highlight and was greatly enjoyed, and appreciated, by their audience.

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Caistor & District A.S. Autumn Mini open show was held on Friday 23 October. Results: Guppies: 1, Mr. and Mrs. Brackenbury; 2, Mr. and Mrs. K. Hare. Mollies: 1, Mr. and Mrs. Brackenbury; 2, Mr. and Mrs. K. Hare; 3, Mr. and Mrs. Culley. Platies: 1 and 2, Mr. and Mrs. K. Hare; 3, J. P. Howden. Swords: 1, R. Day; 2, M. Black; 3, J. P. Howden. A.O.V. Livebearer: 1 and 2, D. Moody; 3, S. Harrison. A.V. Barbs: 1 and 2, Mr. and Mrs. Culley; 3, T. Greaves. A.V. Characins: 1, D. Moody; 2, R. Day; 3, R. Lukes. Angels: 1, J. P. Howden; 2, Mr. and Mrs. K. Hare. Rift Valley: 1, P. Newton; 2, L. and Y. Pickford; 3, Mr. and Mrs. Brackenbury. A.O.V. Cichlids: 1, L. and Y. Pickford; 2, M. Black. Corydoras: 1, 2 and 3, D. Heward. A.O.V. Catfish: 1, L. and Y. Pickford; 2, Mr. and Mrs. Hare; 3, I. Last. Fighters: 1 and 3, Mr. and Mrs. Brackenbury; 2, L. and Y. Pickford. A.O.V. Anabantids: 1, S. Harrison; 2, Mr. and Mrs. K. Hare; 3, Mr. and Mrs. Culley. Ras, Dan. and Mins.: 1, S. Harrison; 2 and 3, Mr. and Mrs. Brackenbury. Killiefish: 1, I. and B. Johnson; 2, Mr. and Mrs. K. Hare; 3, Mr. and Mrs. Culley. Loaches and Botias: 1, L. and Y. Pickford; 2, Mr. and Mrs. Hare. Sharks and Foxes: 1, L. Davidson; 2, Mr. and Mrs. Brackenbury; 3, I. and E. Johnson. A.O.V. Tropical: 1, M. Black; 2, L. and Y. Pickford; 3, S. Harrison. Coldwater: 1, C. and N. Holmes; 2, V. R. Black; 3, L. and Y. Pickford. Pairs (Egglayers): 1, Mr. and Mrs. K. Hare; 2, S. Harrison; 3, V. Lukes. Pairs (Livebearer): 1 Mr. and Mrs. Brackenbury; 2, Mr. and Mrs. Culley. Breeders (Egglayers): 1, 2 and 3, B Todd. Breeders (Livebearer): 1, S. Harrison; 2, Mr. and Mrs. Brackenbury. L. and Y. Pickford took Best in Show. Mr. G. Andrews and Mr. T. Douglas from Hull judged.

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THE Potteries and District A.S. 2nd annual open show attracted almost 500 entries from all over the country to compete for over £850 of sponsored cash prizes. The show was once again a huge success with over 1,500 visitors. The Best Fish in Show award went to Mr. R. Steele (Ind.) with a superb Pakistani Butterfly marine fish. He was awarded the £85 cash prize and the superb Royal Doulton cut glass rosebowl annual trophy. The Best Society award went to Bridgewater A.S. whose sole exhibitors were Mr. and Mrs. Underwood, who totalled a fantastic seven firsts, three seconds, four thirds and two fourths, winning over £220 cash prize money. The largest fish in show award was once again sponsored by Aquatic Nurseries Ltd. and was again won by Mr. Kevin Armstrong (Potteries and District) with his *Osphronemus goramy*. Other results: Guppy: 1 and 4, Pins (Ind.); 2, A. Evans (Ind.); 3, Mr. and Mrs. Carney (Bethnal Green). Swordtail: 1, M. Johnson (Forest Town); 2, Mr. and Mrs. Carney; 3, J. Proves (Potteries); S. Waterhouse (Merseyside). Molly: 1, 2, 3 and 4, Mr. and Mrs. Carney. Platy: 1, S. Waterhouse; 2, H. Bareis (Tidbury); 3, R. A. Johnson (Hyde). A.O.V. Livebearer (section winner): 1, K. Griffiths (Nuneaton); 2, Mr. and Mrs. Waterhouse; 3, Mr. and Mrs. Underwood (Bridgwater); 4, K. Griffiths (Nuneaton). Small Barbs: 1, M. Kirkham (MASG); 2, B. W. Carter (St. Helens); 3, Gary and Darren (Leamington); 4, Mrs. D. Cruickshank (Catfish). A.O.V. Barb (section winner): 1 and 2, Mrs. D. Cruickshank; 3, Pins; 4, K. Bloor (Potteries). Small Characin (section winner): 1, Mr. T. Stansfield (Leeds); 2, K. Griffiths; 3, T. Hawkins (Ind.); 4, Pins. Large Characins: 1, P. A. Hughes (Loughborough); 2, Mr. and Mrs. Waterhouse; 3, G. Edwards (North Staffs.); 4, Mr. and Mrs. Carney. A.V. Anabantids (section winner): 1, Mr. and Mrs. Underwood; 2, Gary and Darren. 3, K. Armstrong (Potteries); 4, Miss H. Gibson (North Staffs.). Fighters: 1, 2 and 4, D. and P. Lawton (Potteries); 3, K. Swan (MASG). Toothcarps (section winner): 1, 2 and 3, Mr. and Mrs. Waterhouse; 4, I. Fuller (MASG). Dwarf Cichlids: 1, R. Glover (Ind.); 2, L. F. Langton (Stafford); 3, I. Fuller; 4, D. Shaw (Cannock). Rift Valley Cichlids (section winner): 1, Mr. and Mrs. Waterhouse; 2, K. M. Fisher (Forest Town); 3, Mrs. N. Hollingworth (Forest Town); 4, D. Shaw. Angels: 1, S. Hutchinson (Potteries); 2, H. Bareis; 3, T. Hawkins (Ind.); 4, K. Smith (Ind.). A.O.V. Cichlid: 1, K. M. Fisher; 2, T. Stansfield (Leeds); 3, Mr. and Mrs. Underwood; 4, N. Williams (Potteries). Corydoras/brochis: 1, Mr. and Mrs. Underwood; 2, Mr. and Mrs. Waterhouse; 3, D. Foley (Bethnal Green); 4, D. and P. Lawton (Potteries). A.O.V. Catfish (section winner): 1, Mr. and Mrs. Waterhouse; 2, K. M. Fisher; 3, M. Kirkham (MASG); 4, Colin Burton (MASG). Loaches and Botias (section winner): 1 and 4, Mr. and Mrs. Underwood; 2 and 3, Pins (Ind.). Rasboras (section winner): 1, 2 and 4, G. Hemmings (Hinkley); 3, S. Grayham (Potteries). Danios and Minnows: 1, Ian Fuller; 2, Mr. and Mrs. D. Perry (Doncaster); 3, P. Chesters (Tidbury); 4, Mrs. D. Cruickshank (Catfish). Sharks and Foxes: 1, G. Bould (Potteries); 2 and 3, Mr. and Mrs. Underwood; 4, H. Evans (Cannock). A.O.V. Tropical (section winner): 1 and 2, Mr. and Mrs. Underwood; 3, N. Williams (Potteries); 4, Mr. and Mrs. D. Perry (Doncaster). Breeders (Livebearers) (section winner): 1 and 2, M. Kirkham; 3, Mrs. A. Smith (Forest Town); 4, H. A. Bareis. Breeders (Egglayers): 1, Mrs. A. P. Wilson (Stafford); 2, P. A. Hughes (Loughborough); 3, I. Fuller; 4, Mr. and Mrs. Hall (Cannock). Pairs (Egglayers) (section winner): 1, Mr. and Mrs. Underwood; 2, R. and A. Johnson (Hyde); 3, Pins; 4, H. Evans. Pairs (Livebearer): 1, M. Kirkham; 2, K. Griffiths (Nuneaton); 3, Mr. and Mrs. Underwood; 4, Mr. and Mrs. Waterhouse. Single-Tail Goldfish: 1, A. Evans (Ind.); 2 and 4, B. Lewis (Ind.); 3, K. Swan (MASG). Twin-Tail Goldfish (section winner): 1 and 2, Mr. and Mrs. Underwood; 3, Mr. Pottman (Ind.); 4, A. Evans. A.O.V. Coldwater: 1, M. Kirkham; 2, B. Lewis; 3 and 4, A. and R. Potts (Cannock). Junior Livebearers (section winner): 1, P. Underwood; 2, Miss J. Johnson (Forest Town); 3 and 4, S. Waterhouse. Juniors (Egglayers): 1, R. Short (Ind.); 2, P. Lawton (Potteries); 3, S. Waterhouse; 4, G. Edwards (North Staffs.). Ladies (section winners): 1, Mrs. N. Hollingworth (Forest Town); 2, P. Masters (Ind.); 3, Mrs. Waterhouse; 4, Mrs. S. Underwood. Plants (Rooted): 1, A. and R. Potts. Plants (cuttings): (section winner): 1, A. and R. Potts; 2, Mrs. A. P. Wilson (Stafford); 3, L. F. Langton (Stafford). Plants (Floating): 1, M. Kirkham; 2, 3 and 4, A. and R. Potts. Marine (section winner): 1, R. Steele (Ind.); 2, D. and P. Lawton; 3 and 4, B. Leyland (St. Helens, Best in Show.

The Society thank all their sponsors for giving such fantastic prizes, exhibitors for providing a superb show of fish, the M.A.A.S. judges for first class judging and to the *Aquarist & Pondkeeper* for advertisements.

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CHANGE of day and venue. The **Stafford A.S.** now meet at the Universal Sports Club, Doxey Road, Stafford, on the 2nd and 4th Tuesdays in the month. Secretary, L. F. Lainton, 280 Sandon Road, Stafford. ST16 3HP.

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CHANGE OF SECRETARY

Evesham Fishkeepers Society: Mrs. J. R. Baker, 26, Manor Road, Middle Littleton, Evesham Worcs, WR11 5LL. (Tel: Evesham 832990).

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THE following were elected at the a.g.m. of **Evesham Fish-Keepers' Society** on 7th October: Chairman, Mr. K. R. Baker; Vice-Chairman, Dr. Dave-le-Provost, Secretary, Mrs. J. R. Baker; Show Secretary, Mr. R. Jenkins; Asst. Show Secretary, Mrs. J. R. Baker; Treasurer, Mrs. E. M. Thornton; Minutes Secretary, Mrs. E. M. Thornton; Public Relations Officer, Mr. P. Egan.

NORTH

THE fifth meeting of the **Statesman League** match was held at York. It was the turn of the **Hull A.S.** to do the judging with the following results:—Scarborough 82 points; York 66; Bridlington 47; Wyke 15; Ebor 13; leaving the league table as follows: Scarborough, 267 points; Bridlington, 229; Hull, 215; York, 195; Wyke, 120; Ebor, 48.

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THE final match for the 1981 statesmans league, held at Bridlington on the 28th October, saw **Scarborough A.S.** crowned as Champions—a fine achievement as they only joined the league at the start of this season. **York A.S.** judged the match with the following results: Scarborough 86 points; Bridlington 72; Hull 23; Wyke 18; Ebor 13. Leaving the league table as follows: Scarborough 353 points; Bridlington 301; Hull 238; York 195; Wyke 138; Ebor 58.

SCOTLAND

THE **Scottish Goldfish Group** held their fourth annual open show in Dunfermline, with the following results: Common Goldfish and Comets: 1, Dave Anderson; 2 and 4, Jake Milligan; 3, Neil Kendall. Shubunkins: 1 and 3, Alex King; 2, Jimmy Norrie; 4, Bill Coburn. Veiltails: 1, 2 and 4, Alex King; 3, Benny Robertson. Fantails: 1 and 2, Tom McLean; 3, Dave Anderson; 4, Alex King. Dorsal-Less: 1 and 2, Alex King; 3, Bill Coburn; 4, Dave Anderson. A.O.V. Doubletail: 1, 2 and 4, Andy Young; 3, Jimmy Norrie. Singletail Breeders: 1, 2 and 4, Alex King; 3, Jimmy Norrie. Twintail Breeders: 1, 2, 3 and 4, Tom McLean.

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THE **Paisley & District A.S.** meetings were held on 1st September and 6th October. The table show for the September meeting was Coldwater and Livebearers (except Guppies). Winners were: Coldwater Section: 1 and 3, S. Hamilton; 2 and 4, R. Dunbar. Livebearer Section (Senior League): 1, S. Hamilton (Hi-fin Swordtail); 2 and 3, J. Thomson (Liberty Mollies). Junior League: 1, A. Paterson (Swordtail); 2, A. Stewart (Platy). The slide show was: Cichlids the Personality fish.

The table show in October was devoted to Characins. Guest speaker Tommy Boyle from Clyde A.S., who gave a very interesting talk and slide-show on Characins. Winners were: (Senior League): 1, R. Brooking (Serpae tetra); 2, S. Hamilton (Black widow); 3, R. Brooking (Cardinal tetra); 4, R. Dunbar (Bleeding-heart tetra). Junior League: 1, D. Rogan (Glowlight tetra); 2, A. Paterson (Black widow); 3, A. Paterson (Neon tetra); 4, R. Brooking (Neon tetra). Meetings are held in the Paisley Museum, High Street, Paisley, on the first Tuesday of every month at 7.30 p.m. Further details can be obtained from the Secretary, P. J. Kodur, 3 Rowan Street, Paisley, Renfrewshire, Scotland, PA2 6RG.

Grangemouth A.S. would like to join with a club or clubs from south of the border to form a mutual exchange of news, views, and experiences, etc. It is felt that such a 'marriage' would be of tremendous benefit to all concerned they are a relatively small club who hold their meetings on the second and last Thursdays of every month in the Youth and Community Unit of the Grangemouth Sports Complex, at 7.30 p.m. Their present members have a variety of interests within the hobby, one member having recently spawned and raised *Corydoras barbatus*. These are the only tank bred Barbatus in Scotland. Some of their members regularly show fish in the various open shows throughout Scotland and many first prizes have resulted. Each month a newsletter "Tins and things" is distributed to members and they would be pleased to forward a copy to anybody who is interested. "Tins And Things" contains many interesting items on the success and failures of their members' attempts to spawn various species of fish. Any interested club should please write to the secretary Mrs. J. Wardlaw, 15 Portal Road, Grangemouth.

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AT a recently convened meeting of the **Edinburgh A.S.** it was decided they would once more become active in shows in Scotland as well as functioning as a proper club. The following were elected as office bearers: Chairman, Len Davidson; Show Manager, J. J. Irish; Secretary, J. Milligan; Treasurer, W. McMasters; P.R.O., B. Budge. All enquiries should be sent to the Secretary J. Milligan, 21 Stevenson Avenue, Edinburgh. (031-337 6563).

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RESULTS of the **Edinburgh Aquarium and Pondkeepers** annual open show, held on 13 October at Craigroyston Community Centre:

Results: 1, Edinburgh (EAP); 2, Dunfermline (DDAC); 3, Craigshill (CASF); 4, Goosebridge (GAS); 5, Newcastle (NAS); 6, Dalkeith (DCCAS); 7, Stirling (SAC); 8, Livingston (LAS); 9, Muirhouse (MAS); 10, Clyde (CDAS); 11, Berwick (BAS); 12, Fife Group (BKA) (FG BKA); 13, Forfar (FDAS); 14, Scottish A.S. (SAS); 15, Independent (I); 16, Kirkcaldy (KAS); 17, Scottish Gold Lion Group (SGG); 18, Dunbar; 19, Grangemouth.

Class 1: 1 and 3, J. Wells; 2, B. Hetherington. 2: 1 and 3, D. McFarlane (SAC); 2, M. Gilchrist (SAC). 3: 1, R. Bell (MAS); 2, J. Davidson (NAS); 3, D. Long (DDAC). 4: 1, H. Hoey (DDAS); 2, J. Wells (DDAS); 3, D. Long. 5: 1, D. Long, 2 and 3, M. Gilhurst (SAC). 6: 1, D. J. Niven (EAP). 7: 1 and 2, M. Gilchrist (SAC); 3, J. Currie (DDAS). 8: 1, G. Dingwall (SAS); 2 and 3, J. C. McPhaul (CAS). 9: 1, A. and E. Brown (BKA); 2, A. B. Scott (NAS); 3, S. Wilson (NAS). 10: 1, 2 and 3, A. B. Scott. 11: 1, E. Duke (CDAS); 2, G. Talbot (A); 3, H. Sheilds (EAP). 12: 1, W. Brown (DDAS); 2 and 3, E. D. Mann (P). 13: 1 and 2, E. D. Mann; 3, A. B. Scott. 14: 1, A. Longmuir (FAS); 2, T. Ramsay (SAS); 3, J. Wells. 15: 1, T. Ramsay; 2, A. Longmuir; 3, A. and E. Smith (CDAS). 16: 1, A. and E. Smith; 2, A. B. Scott; 3, E. Duke (CDAS). 17: 1, 2 and 3, T. Ramsay. 18: 1, B. Budge (EAP); 2, R. Hetherington (DDAS); 3, S. Booth (GAS). 19: 1, D. Long; 2, K. Shankland (CDAS); 3, G. Talbot (FAS). 20: 1, K. Law (EAP); 2, M. Gilchrist (SAC); 3, K. Shankland. 21: 1, H. Anderson (DCCAS); 2, D. Long; 3, A. B. Scott. 22: 1 and 2, S. Booth (GAS); 3, H. A. Hoey (DDAS). 23: 1, H. A. Hoey; 2, A. B. Scott; 3, G. Rae (NAS). 24: 1, A. B. Scott; 2, J. Wells; 3, G. Dingwall (CDAS). 25: 1, G. Dingwall; 2, H. Anderson; 3, T. Ramsay. 26: 1, B. Hetherington 2, J. Wells; 3, D. Fettes (BAS). 27: 1, A. Longmuir; 2, T. Ramsay; 3, A. B. Scott. 28: 1, D. Fettes; 2, H. Sheilds (EAP); 3, T. Ramsay. 29: 1, T. Ramsay; 2, J. Wells; 3, A. Robertson (FGBKA). 30: 1 and 3, D. Long; 2, D. Dobbie (DDAS). 31: 1, D. Dobbie; 2, H. Anderson; 3, A. B. Scott. 32: 1, R. Harley (KAS); 2, T. Ramsay; 3, J. Davidson (NAS). 33: 1 and 2, H. Hoey; 3, M. Kyle (DCCAS) 34: 1, D. Long; 2, J. Wells; 3, M. Gilchrist. 36: 1 and 3, H. Sheilds (EAP); 2, B. Hetherington. 37: 1, D. MacFarlane (GAS); 2, R. Bell (MAS); 3, G. Dingwall (CDAS). 38: 1, J. Milligan (EAP); 2, J. McPhail (CAS); 3, B. Fleming (LAS). 39: 1 and 2, McLean. 40: 1, J. Makin (GRAS). 41: J. C. McPhaul. 42: 1, J. Wells; 2 and 3, R. Bell. 43: 1, D. Long; 2, P. Findlay (EAP); 3, M. Gilchrist. 45: 1, D. Anderson; 2, A. Rennie (EAP). 46: 1, D. Anderson; 2, A. Rennie. 47: 1 and 2, T. McLean; 3, D. Anderson (SGB). 48: 1, D. Anderson. 49: 1, A. Rennie; 2, J. Davidson; 3, T. Ramsay. 50: 1, T. Ramsay; 2 and 3, B. Budge. 51: 1, K. Sheilds (EAP); 2, G. Burns (D); 3, P. Rennie (EAP).

Specials: G. Dingwall (STAS) Best Livebearer; Best in show. A. B. Scott, (NAS) Best Characin; S. Booth (GAS). W. Brown (DDAS) Best Barb 'A'. Pimedella species. E. D. Mann (FDAS) Best Barb 'B'. A. and G. Smith (CAS) Best Cichlid; Top pointed EAP member. D. Long (DDAS) Best Anabantid; H. Sheilds. S. Booth. (GAS) Best Catfish. A. B. Scott (NAS) Best Tropical Minnows. B. Hetherington (DDAS) Best Rasbora. A. Longmuir (FDAS) Best Loach. D. Fettes (BAS) Best Shark. R. Harley (KAS) Best Pair Livebearers. J. Milligan (EAD) Best Breeders Livebearers. J. Makin (GRAS) Best Breeders Egglayers. D. Anderson (SGB) Best Coldwater and Best Shubunkins. D. Anderson (SGB) Best Fancy. T. McLean (SGB) Best Breeders Coldwater. T. Ramsay (SAS) Best Tropical Plants. K. Sheilds (EAP) Best Junior Coldwater.

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

DECEMBER

12th December: South Park Aquatic (Study) Society Meeting. Christmas open night held at: Wimbledon Community Centre, St. George's Road, Loudon S.W.19. Details from Mrs. M. Dudley. Tel: 01-540 5662.

18th December: Central Midlands Cichlid Group. Special meeting, 8 p.m., 71 Saxon Road, Penkridge, Staffs. Further details telephone 078-571 3944.

JANUARY

29th January: Central Midlands Cichlid Group. Meeting 8 p.m. Further details from Mrs. Maureen Hall, 71 Saxon Road, Penkridge, Staffs. (Tel: 078-571 3944).

FEBRUARY

14th February: Sheaf Valley A.S. open show at the Dormer Twist Drill. For further information Phone Mr. D. Golland (Sheffield 746046).

28th February: Central Midlands Cichlid Group. Meeting at 8 p.m. Further details from Mrs. Maureen Hall, 71 Saxon Road, Penkridge, Staffs. (Tel: 078-571 3944).

MARCH

7th March: Keighly Aquarist Society open show at Victoria Hall, Keighly. Benching 12-20 p.m. Schedules from Mrs. P. Robinson, 2 Hope Hill View, Cottingly, Bingley, Yorks.