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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers

In this issue:

Spawning a Unique Anabantid

The Hump Backed Limia

(Spotlight feature)



THE AQUARIST AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

Published Monthly 70p

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Anabantid

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The Editor accepts no
responsibility for views expressed
by contributors

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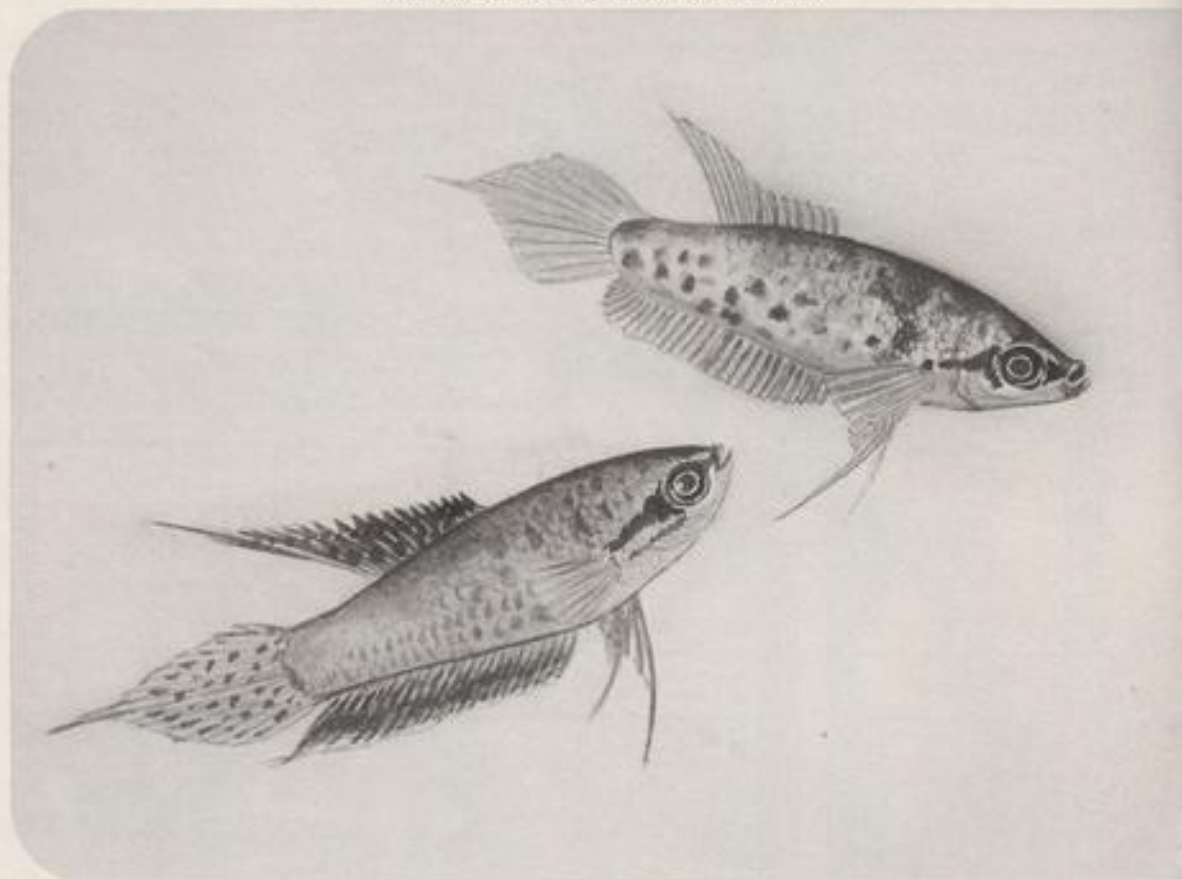
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The spawning of a unique **ANABANTID**

by M. R. Kirkham

illustrated by Jack Hems



I FIRST OBTAINED five of these unusual and rare anabantidae from a very good friend and aquarist, T. Crookshank, on the 31st November 1981.

Discovered by Kretser in 1937, this is the only member of the genus and found only in Sri Lanka. The only other information I could find about

them in my books (T.F.H. Loose Leaf) was that they like soft, slightly acid water. Size 1½ inches (38 mm) can be bred, build bubble nests under leaves or ledges or floating plants; and you can leave both parents in the tank after spawning. So I set up a tank 18 in. × 10 in. × 10 in. a week before I was due to pick the fish up. I put a sand base in (honey sand) some Java fern (*Microsorium pteropus*) floating Indian fern (*Ceratopteris cornuta*) and broken flower pots. The water I used was rain water pH 5.7 dh 0.2. I added 10 ml of black water tonic to help age and condition the water, temperature 75°F.

When I got the fish back home they were about ¾ inch (19 mm) in size, very dark in colour and looked like four males and one female. They settled down quite well. I fed them on freshly hatched brine shrimp and grindal worm and as they grew, white worm, live adult brine shrimp and occasionally flake food. On this food they grew very well and sexed out by the beginning of January. It turned out that they were two males and three females, the males having extensions on their dorsals and extremely long pointed caudal fins with a bright electric blue tinge to the tips of all fins and tail.

I had noticed some bubbles underneath one of the broken flower pots, so I thought I'd try and breed them and so on 10th January 1982 I set up a 10 in. × 10 in. × 8 in. tank, sand based, small clump of Java fern and floating Indian fern. I put 3 inches of water from the main tank and 1 inch of fresh rain water and added 10 ml of black water tonic as a buffer. The back and sides of the tank were blacked out so that the fish were disturbed as little as possible. No air was used. I chose the biggest male and one of the females

and introduced them into the breeding tank on 11th January 1982. The male built a nest twice between 11th and 31st January but with no luck. I occasionally fed them during this period on white worm and live adult brine shrimp. On the 31st January 1982, Sunday morning about 10.30 a.m. I changed the females. I had to go out visiting that afternoon and on returning at about 4.30 p.m., I went into my fish house to do some water changes. I happened to look into the Malpulutta's breeding tank and to my surprise I saw quite a large bubble nest under the leaves of Java fern. On looking closer at the nest I noticed eggs in the bubbles and observed the pair were still spawning. The female would gently peck at the male's side, encouraging him to curl around her; in a typical anabantid spawning embrace the male spreads his anal fin across the female and they embrace for 10 to 15 seconds; as the female breaks loose of the male the eggs are caught in the male's anal fin and as he slowly drops to the bottom of the tank, still in the embracement position, the female picks 10 to 15 eggs out of the male's cupped anal fin with her mouth and goes up to the nest and blows the eggs into it. The male then checks the nest and rearranges the eggs. The entire spawning procedure is very gentle.

The male must fertilize the eggs when he cups his anal fin around the female. I noted that the female did the egg carrying after each embrace. After they had completed the spawning the male kept the female well away from the nest and the nesting area, so I moved her back to the main tank. I then placed cling-film over the cover-glass and around the top of the tank to prevent any draughts and air difference which could cause trouble to the fry.

The eggs, which were white in colour, had turned amber the next day (1st February 1982) and on the afternoon of the 2nd February 1982 the fry had begun to hatch and were hanging from the nest; on 3rd February 1982

they began dropping from the nest (note: very small fry), the male catching the fry as they fell and blowing them back up into the nest. I added three drops of liquifry egg-layer to help encourage *infusoria* for first food for the fry. They started free-swimming on 5th February 1982, and on 7th February 1982 I started feeding liquifry and micro eel. I fed micro eel instead of micro worm because the eel swims about in the water and the worm sinks straight to the bottom, and as the fry stay close to the surface the micro eel is the ideal live food. The fry greedily took micro eel on 10th February 1982 and started to feed on newly hatched brine shrimp on 13th February. They are growing very well and still near the water surface. The male is still in with them and does not seem bothered by them.

I have about 45 to 50 survived fry and they are doing well.

I have since bred the other male with another female in a smaller tank containing just a broken flower pot and there are about 200 fry from this spawning; the water conditions for these spawnings was temperature 82°F pH 5.7 dh zero.

DISCOVER THE FISH

By Pisces—

The first is in GAUGE but not in MEASURE

The second is in WORK but not in LEISURE

The third is in LABOUR but not in TOIL

The fourth is in EARTH but not in SOIL

The fifth is in FEMALE and also in PAIR

The sixth is in SPECIMEN but not in RARE

The last is in STRIP but not in BARE

WVRLD

LATE AUGUST finds me sitting at my typewriter on a day when strong winds and heavy showers combine with a dull, grey sky to confirm that summer is almost over; and although my rose bushes bear large clusters of buds that will make a final show in the next few weeks, I recall that I have already planted my prepared hyacinths for Christmas flowering. The earlier, warmer months of the summer, complete with high temperatures, should have cut down on electricity costs for heating tropical tanks. Electricity bills will now begin to rise again as aquarium heaters and lights remain on for longer periods as autumn and then winter displace summer.

I bought myself some new fish today: two each of neons, white clouds, red-eyed tetras, harlequins, feather-tips, peppered catfish, golden gouramis, pearl gouramis, rosy barbs and kribensis; plus a single, black noen. The 21 fish cost me £11.80—which is an average of 56p per (young) fish.

Mr. Kevin Appleton resides at 46 Oak Lane, Old Cotton, Norwich, Norfolk, and he is a leading figure in Thorpe and District Aquarist Society. He writes: "Many societies must experience the problems of my own in finding regular speakers, slide shows, etc. for club evenings. Likewise, many societies probably have several members who either have slides available for hire or are prepared to lecture on a particular subject. Our own society has a nucleus of programmes and lectures and I would like to hear from other clubs or persons who would like to add their name to this list; the eventual idea being to make this list available to all aquatic societies to help with programme planning. Obviously the success of such a venture relies on people responding to this request; and I do hope that many responses are received. Interested parties should contact me at the above address; or by telephone at Norwich 411443 most evenings/weekends."

Mr. Patrick Baird's address is 59

WHAT IS YOUR OPINION?



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

Bladon Drive, Belfast BT9 5JN, and he says: "Knowing how much you like receiving letters from your readers in Northern Ireland, I thought that I would drop you a line—my last letter to you was about four years ago—and let you know how my interest in the hobby is progressing. There was a period of about two years when my interest in fishkeeping almost faded totally; I say 'almost' as I still had some goldfish. I even cancelled my subscription to *The Aquarist*. My interest was suddenly revitalised when I started working in one of the tropical fish shops here in Belfast.

"I know have four, large tanks in operation, and my main interest lies with the keeping and breeding of catfish and both African and South American cichlids. I prefer to keep the rarer types of fish, which in most cases are the most beautiful—and, unfortunately, the dearest. This is where working in an aquatic shop comes in handy—first choice of all the fish on sale! Unfortunately, very many of the catfish and cichlids, other than the 'cheapies', e.g. peppered cats and firemouths, are very few and far between. Most of my fish have been obtained through local breeder and importer Robin Kirk. My collection at the moment

includes a nice pair of *Cichlasoma nicaraguense*, a *C. crassa*, two *C. maculicauda*, some *Julidochromis dickfeldi*, a *Tilapia buttikoferi*; and in my African cichlid tank I have some *Cyphotilapia frontosa*—a fish which is virtually impossible to obtain at the moment in this part of the country—a pair of *Aristochromis lombardio* and a pair of *Lamprologus tetracanthus*.

"My collection of catfish includes a 13 in. *Plecostomus*, a 14 in. *Pimelodus gracilis*, a 6 in. *Leiocassis siamensis*, a fairly large *Synodontis schall*, a couple of banjo cats and a lovely, little *Hemiancistrus vittatus*—clown pleco. I use a combination of U/G and internal and external power filters in my tanks. A Whisper 800 and 1,000 supply my tanks with air, and as I do not worry about growing plants in any of my tanks I use Gro-Lux tubes for a few hours per day. Tank decor consists mainly of black rocks, cork bark, bogwood and an amazing, new substance called Grotto Ceramics, which retails for around £1.50 per lb. It has the appearance of volcanic rock and is totally inert.

"I am looking forward to the annual Open Show, run by the I.F.A.S. in Bangor, County Down, at the end of August. Will you be there, Mr. Whiteside?" (Sadly I was unable to attend the show this year; however, two friends who did attend gave a very favourable report. B.W.)

"Feeding fish—especially large catfish and cichlids—is a bit of a headache. Usually it involves chopping up raw heart, raw fish and a good supply of vegetable matter for the plecos and the Malawi cichlids. The best convenience food I have found, which seems to satisfy the needs of all my fish, is Wardley's Cichlid Pellets. The pellets also sink immediately, which is ideal for bottom-feeding fish. P.S. I was interested to note that you were thinking of featuring Mr. Laurie Morris in *Meet the Aquarist*. I think it would be an

excellent idea: I think the hobby of keeping fish in N. Ireland owes a great deal to Mr. Morris and I wish him a happy retirement."

Master Derek Knight is only 11 years old and his address is 4 Poplar Street, Waldridge, Chester-Le-Street, Co. Durham. He writes: "I wonder if you could help me. I have a tank in which I keep angel fish. I also have a spare tank but cannot afford another heater. When I read the July issue of this magazine containing the article about axolotls I thought, good, I'll keep some of them; but I can't find anyone who sells them; so I wonder if you know anybody who breeds them so that the person could send me some eggs to hatch out. I would gladly pay for them—if they are not too expensive. If you don't know anybody, then maybe if you put this letter in *W.Y.O.* someone might send some to me?" (I don't know anyone who keeps these interesting creatures; but feel sure that some reader who does will supply Derek with 'eggs'. Perhaps some reader with a spare heater may care to send it to Master Knight. . . . B.W.)

Another young reader is Master Mark Christopher Delazarus, of 163 Bridge Road, Slade Green, Erith, Kent. He writes: "I am 13 years old. I have been keeping coldwater fish for three years, terrapins for three years and tropical fish for 11 months. I have one 12 in. coldwater tank, one 12 in. terrapin tank, one 14 in. marine tank and one freshwater, tropical tank. I would like to hear more about terrapins as little has been written about them. My tropical tank houses gouramies, catfish, livebearers and many other little fish. My coldwater fish are fed only on flake food as I find they will not take any kind of live food. I collect my marine crabs from rock pools at the seaside; also shrimps and fish. The tank has been set up for only four weeks and contains only coldwater marines.

"I get my fish in only one shop—

which is in Dartford, a train ride away. It has only nine tropical tanks but the service is friendly. There are larger shops in my area but I don't think the people are very nice, so I stick to one shop. I am hoping to set up another 24 in. tropical tank housing catfish. If you know anyone of my age interested in the hobby please ask him to drop me a line."

No. 4 Vale Grove, Queensbury, Bradford, W. Yorks, BD13 2QR, heads a letter I received some time ago from Mrs. Patricia M. Child. She wrote: ". . . I felt I must write and tell you about the attractions of my particular coldwater fish; though I'm sure that when I have done you'll have me classed as certifiable because, to me, each one of these fish has its own personality; and they are what my family refer to as 'a gang of spoilt, little brats.'

"How it all really started I don't know, except for the inevitable goldfish won at a garden fete by my son. Eventually, if he didn't win one someone else obligingly did; and as soon as one settled and grew to fit the bowl another one arrived; so in the end we had three bowls adorning the sideboard. One fish died and I replaced it with a beautiful calico fantail—which was too big for the bowl, so I bought a small tank. Straight away, delighted with all the newly-acquired space, I bought a comet, a catfish that chewed all the other fishes tails and had to be given away, two fantails and a bitterling—and I over-crowded it.

"There followed a 24 in. × 12 in. × 12 in. tank with an air stone and a U/G filter; and, at the same time, I developed a passion for orandas. I now have seven of them—five red caps, one chocolate and one red—sharing the tank with a tiny golden medaka, and a weather loach called Hissing Sidney. I bought him mainly because I was told he would keep the bottom of the tank clean, and I wasn't too keen on him at first;

but now I would say he has the most character of all, especially after watching him sitting in the middle of a plant, relaxing, and gradually gliding out again onto the floor of the tank.

"I joined the local aquarist society and started going to shows and auctions, although most members specialise in tropicals. I then acquired an 18 in. × 12 in. × 12 in. tank, which houses the calico fantail, one of the original goldfish, the comet, the bitterling, a shubunkin and a golden loach. Both tanks have an abundance of plants—such as *Elodea*, *Cabomba*, *Ludwigia*, some I can't name, and two Amazon swords in each, which I didn't know were for warmer water at the time; and though these plants are not growing they are not dying either—yet. Sometimes the fish do nibble at these plants; but I have no trouble knowing when the fish are hungry, or whether I am feeding them enough or too much. They are creatures of habit and let me know when they are hungry by congregating in one corner of the tank and splashing. They have a variety of flake food and dried food, and I feed them live food as often as I can—at least once per week—hence the name 'spoilt, little brats.'

"I have made no attempt to breed my fish, though they do occasionally chase around, and, as yet, they are too small for showing, so they are very much pets.

"I can't compare their merits with those of tropicals because I have never had any tropicals, but they do have great attractions, especially in their characters—which vary with each variety. Their food is cheap and easily available—they like quite a lot of our food too—they need no additives, and because there is no heater, there is little expense in running their filters—which may even be unnecessary, from what I have read since.

"I have lost some of my fish at

times—some with fin congestion, one for no apparent reason at all, but my most rewarding experiences have been just lately when I successfully cured Hissing Sidney of fungus, and prevented an outbreak; and just this week my red oranda, after never putting its dorsal fin up for two months, was waiting for its food with its fin fully erect and healthy. Why I don't know, actually, but nevertheless it happened.

"Thank you very much for giving me the chance to sound off about my fish. It's nice to find a cold-water space in a tropical world; and thank you for an excellent column each month."

Photograph 1 is of Mr. Bob Crossan, a friend of mine who has a most beautiful marine aquarium—as well as an attractive garden pond. Despite poor eyesight—Bob has to make occasional use of a large magnifying glass—he has been particularly success-



Bob Crossan shows off his beautiful marine aquarium

ful with his marines—which he has kept for a number of years. Recently he telephoned me to tell me that his marine clowns seemed to be indulging in peculiar behaviour; and he wondered if they might be spawning. Despite a measure of disbelief I armed myself with my camera and drove to Bob's home. I was thrilled and delighted to see that a pair of Bob's clowns had

indeed spawned and were guarding their spawn—on the right-hand front curve of a large sea shell used as a decoration in the marine tank. Immediately I got my camera clicking and captured the event. Photograph 2 shows the male and the female fish. One fish is on patrol at the rear of the shell, to fend off any other fish that might approach; the other is poised, like a hovering bird, in the entrance to the large shell. Photograph 3 shows



Male and Female marine clowns guarding their spawn on a large shell

cultivated either species. One fern has light green leaves; the other dark green leaves.

My thanks to the British Koi-Keepers' Society and the Midland Koi Association for sending me copies of the latest editions of their magazines. I was also pleased to receive issue No. 6 of *Labyrinth*, the magazine of the Anabantoid Association of Great Britain. It contains a number of interesting articles and is edited by Mr



Female clown cleaning developing eggs in Bob Crossan's marine aquarium

D. M. Armitage, 2 Close End, Robert Road, Hedgerley, Bucks.

I note that one of my new, young *kribensis* is dead already. It didn't last long. I wonder if it was killed by an adult angel.

Mr. Kevin D. Rimell resides at 52 Rodborough, Yate, Bristol, and he has the following to say: "I am 23 years of age and have just recently returned to tropical fishkeeping after some six years away from the hobby. I purchased the May issue of *The Aquarist*—my first copy in six years—and was extremely pleased to see your feature still going as strong as ever.

"With reference to your question about prices of fish in different areas, I can answer that with reference to my area. About a month ago I set up two tanks—one

a closer view of the eggs on the shell, with a parent fish cleaning them. I have yet to find out if any young fish developed from the spawning. I should be pleased to hear from you if you have managed to breed any marine fishes.

Photograph 4 shows samples of two ferns kindly sent to me by Myrtle Farm Aquarium and Water Garden's proprietor. Please write to me if you can identify the plants; or if you have



Can you identify these two ferns?

54 in. in length and the other 36 in. Both were purchased second-hand and in my opinion were bargains. They have now been stocked. The larger tank houses two medium-sized angels at £3.00 each, a pair of kribensis that cost £3.00 the pair, six × 1 in. long small firemouths at 35p each, a pair of curviceps at £2.50 the pair, a pair of 2 in. convicts at £2.00 per pair, and a few guppies which came with the tank. Incidentally, the curviceps spawned 24 hours after purchase; however, I lost the entire spawning.

"You asked for personal opinions on kribensis. When I last kept tropical fish I had a pair of spawning kribensis; therefore, I had to have a pair this time—naturally. One thing I must say is that every time I've kept these fish they have bullied everything else in the tank; and the situation is once again the same with my male krib attacking my convicts, angels, curviceps and firemouths. I do not agree with the books when they say these are shy fish.

"Finally, I would like to put out an SOS of sorts. My 54 in. tank is eventually to be used as a dwarf cichlid community tank

with the firemouths and the convicts being transferred to my 36 in. tank once they have matured a little more. However, I have a problem. Apart from kribensis and curviceps I cannot get hold of any dwarf cichlids in my area. Occasionally there are some rams around; but those are all. Please, please, if there is anybody who breeds dwarf cichlids and has any to sell could he or she contact me? I would be eternally grateful for any help with this small problem of mine. Thanks again for a superb magazine and for your excellent feature." (Thank you for your kind comments about W.Y.O., Mr. Rimell. I've been turning out the feature every month now for well over 15 years and must be honest and admit that the stress and strain are taking their toll; and, sadly, the level of my motivation has dropped quite considerably. People in the aquatic world sometimes tend to forget that I have a full-time, taxing profession, and that writing and keeping fishes are merely additional branches of work that began as hobbies. Perhaps I need a transfusion of enthusiasm and motivation. B.W.)

Mr. John E. Young, the Advertisement Manager of *The Aquarist*, wrote and asked me to write a few lines about new sales' aid leaflets produced by

King British Aquarium Accessories Co. Ltd. The two sales' aid leaflets are printed in full colour: the first shows photographs of nine leading aquarists—eight of them professionals—who have nice things to say about King British fish foods. For example, Mr. Graham F. Cox is quoted as saying: "It is a great pleasure to congratulate King British . . . the best domestic fish flake I've tested yet." Another full colour leaflet, well illustrated with photographs, includes pictures of Mr. Keith Barraclough and Mr. Gordon Holmes who, in 1970, founded the King British Aquarium Accessories Co. Ltd. Most of the information printed in the leaflet extols the virtues of King British products—in particular the firm's range of foods. The author(s) make much of the fact that they have actually travelled round various parts of the world to investigate fish nutrition in the natural, wild habitats—as well as in various man-made environments. I wrote a review of King British food in December 1981 but I do not recall its having been published yet. I note that the firm describes its Formula WS3 cure as "unquestionably the very best white spot treatment".

Mr. Clive Lipscomb, whose home is at 5 Wavertree Road, Worthing, Sussex, wrote the following letter some time ago—but the contents retain their interest. "I have been keeping fish for about two years now. I started with a 39 in. × 15 in. × 12 in. community tank and was soon hooked on this fascinating hobby. I have since added another tank of the same size, in which I keep Malawis—and, to my delight, a pair of *Pseudotropheus* species have just bred. I could go on forever about my fish but the reason why I am writing is to comment on some of the topics you listed in an earlier edition.

"I use only Gro-lux lighting in my aquaria and have no trouble at all in sustaining healthy plant growth. The long life and warm colour of these tubes provide the best lighting, in my opinion. I swear by under-gravel filters for

the following reasons: apart from providing the obvious particulate and biological filtration they also provide aeration and water circulation to give even temperature throughout the tank.

"I have found what I think is the ideal background decor for any tank. I use a piece of 3/4 in. polystyrene cut to the size of the tank, then cover this with cork wall tiles. This not only creates an attractive look but also provides good insulation against heat loss. I have never found combined heater/stats very reliable and (have always found them) awkward to adjust. I use external Slick stats with two heaters in each tank. This ensures that if one heater fails the other will still maintain water temperature. They are so easy to adjust, and hold the

temperature steady to within about one degree.

"What is gained from belonging to a society? I am a great believer in aquarists' societies and am press secretary and newsletter editor of the South Downs A.S. Belonging to a club or society can be a great help when starting in the hobby; or even to experienced aquarists. Guest speakers and tape/slide shows provide valuable information and there is always something to learn. There are also trips to wholesalers/retailers normally out of the reach of most enthusiasts, and these broaden one's choice of stock. Much more could be said about this subject but the only real way to find out more is to go along to your local aquarists' society. Finally, I would like to say how much I enjoy your

pages each month. I am also keen to correspond with anyone who keeps and/or breeds Rift Lake cichlids."

Time has beaten me again this month. For a future feature please send me your opinions on the topics in the last letter. I must admit that I am not an unqualified supporter of Gro-Lux lighting or under-gravel filters and have not used either for quite a few years. Please also send me your opinions on the following: (a) cultivating any species of *Cryptocoryne*; (b) breeding dwarf cichlids; unusual livebearers; or catfish; (c) aeration; (d) external filters; (e) tortoises and hibernation; (f) marine aquaria; (g) ponds in winter; and (h) your favourite brands of dried foods. I hope you'll write to me. Goodbye until next time.

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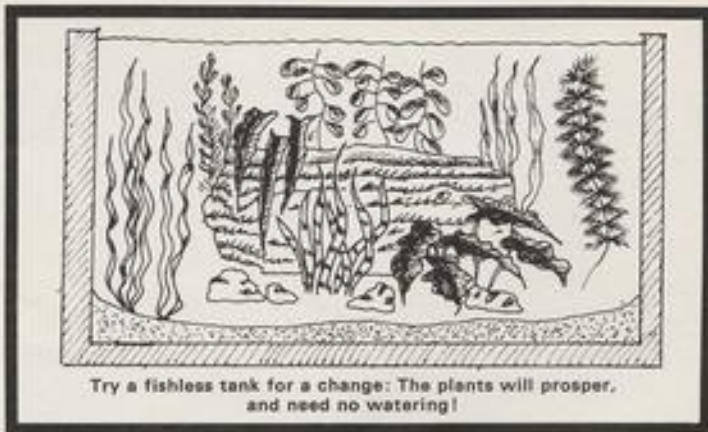
CONSIDERING the vast amount of information available today about how to avoid trouble in your fishkeeping, there remains an unfortunate rigidity of thinking—dating back to the 30s, almost—which can lead newcomers into completely wrong habits. Although the more reputable sellers are usually pretty good in this respect, especially those who specialize in one sort of aquatic activity or another, things can get really out of hand in places like big general stores, garden centres etc., where no hobby-qualified staff are employed. Here one often sees package deals of aquaria or ponds, and in each case a specimen is displayed, containing all the living things, to show the customer what he is in for. One notices that instruction books do not feature in these "bargain offers": yet the essential (sic) elements are clearly shown. These comprise fish, plants (sometimes "weed"), gravel, scavengers and oxygenators and sometimes a free packet of food. The plantings are extremely good entertainment value on the whole, though it must be admitted that overcrowding

of the fish does err very much on the conservative side. I noticed a complete pool set up the other day, priced at about £45. The preformed container was less than 3 ft. long, and it was 1 ft. deep. The goldfish, described as "large" and on sale elsewhere at that establishment for £1 were all of 3 in. long, with waterlilies going at £7.50. *Lobelia cardinalis*, a particular love of mine, was £1.95, though a specialist plant nursery in the vicinity was retailing this for 15p. The pond did, of course, contain some very large snails.

Whilst most sensible buyers do look around these days before parting with their money, it is a great pity that aquaria and ponds are still presented as though they were frozen and inanimate and unaltering things. This is a by-product of the incredibly wrong notion that anything that is instant is thereby good and desirable. Certainly, an instant repair for my infernal car gearbox or a similar effect on muddy boots would be high on anybody's shopping list, but managing a pool or a tank is somewhat like painting a picture. Almost every one is different from the next in some way, and you can ring the variations to suit yourself. Rather like a garden, the results will often reflect the character or the personality of the creator. It is a pity, then, that beginners still have to suffer some of the outdated notions which bedevil us.

Writers still put forth such nonsense that scavengers are useful. By this they usually mean tench, which simply feed from the bottom, are never seen, and certainly won't eat decaying matter. Mussels are sometimes passed off in this role, but as they churn up the floor, are also never seen, and can cause trouble with fish by over-proliferating, these, too, can be crossed from the list: they are quite costly, too. The worst fraud of all is snails, traditionally a "must" on the part of those who sell them, but a "never again" on the part of those who have had to cope with their ravenous appetite for all valuable new growth—so, just leave them out of your collections in future and destroy every one you have. This is not to say that these fascinating creatures should not be kept and studied on their own, or in surroundings with which they are compatible. There is muddled thinking that just because certain things live in water, ergo one has to cram one specimen of each into a tank or pool. Like building an indoor garden. You buy all the nice plants and rocks and furnishings and arrange them to your taste, but you certainly don't rush out and collect snails greenly and toad cats and introduce them to your masterpiece—you make jolly sure that these never get in!

Continued on page 66



Try a fishless tank for a change: The plants will prosper, and need no watering!

The Paradisefish

Macropodus opercularis

by
Rudolph Zukal

THE STANDARD form of this species, or the Paradisefish as it is known, is well known to most aquarists as it is the first and most famous of the fish to have been brought to Europe and was the first to be bred. This happened as early as 1869 when a French consul brought the fish to Paris. There it was bred by the breeder Carboneur. Why aquarists have described it as the Paradisefish, I do not know, for a name referring to the fins of the fish would be more appropriate, it seems to me. When the male adopts a threatening stance and spreads out his splendid fins, it is obvious how apt a name describing the fins would be. It grows to about 8 cm, the female remaining smaller. In captivity the fish are already sexually mature at 5-6 cm. In their native environment in Korea, China, South Vietnam and

the island of Taiwan they grow a little bigger.

The albino variety of the fish differs from the standard form not only in having red eyes, but its whole coloration is redder with striking, red, vertical bands. In addition, I am of the opinion that there is a character difference. In contrast to the basic form, which is quarrelsome and may attack smaller fish, the albino variety seems to have a much more peaceable nature. Perhaps I am mistaken and the fish I keep constitute an exception.

The fish are equipped with an auxiliary breathing organ, the so-called labyrinth, and belong to the large family of Anabantidae. Sexual differentiation is straightforward in adult fish, for the male is larger, stronger and has elongated fins and thick lips. The fins of the female are shorter and rounded off.

The basic variety is happy with a

temperature of 18°C, the albino has need of a little more warmth; in my opinion 20°C is more suitable for them. The tank should not be too small, the bigger the better, with normal tap water, well-planted and some floating plants included. Since they are not particularly sociable the weaker specimens should be provided with hiding places within the dense vegetation. As soon as two males meet each other, they open their gill covers and go at each other in the manner we know from fighting-fish. As already mentioned, they attack smaller fish, nip snails from their shells and so on. They do have one good quality, however. If one deprives them of all other food sources, they will eat up all the planarians in the tank.

The fish spawn near the water surface and the male builds a bubble nest at the surface beforehand, but never with the precision of the species *Colisa lalia*. This often occurs in the community tank, too, but it is better to give the fish the opportunity of breeding in a spawning tank. For this purpose a tank of medium size, normal tap water, 22-24°C, floating plants at the surface, largish stones without sharp edges which will provide

Male beneath recently completed bubble nest





Male left, spreading his fins

cover for the female, are sufficient. During the time in which the nest is being built the female is driven and pursued, often nipped as well, and compelled to spawn. As soon as the female is stimulated she swims under the nest to the male and by ramming the male in the side tells him that she is ready to spawn. The male embraces the female, she turns on her back and both fish extrude their sexual products at the same time. The eggs are mainly lighter than water and rise to the water surface inside the nest. During the spawning action, which lasts about two hours, a few hundred eggs are extruded. After spawning the male takes over care of the brood and the female must be removed, otherwise it may be nipped to death by the male. This can not happen in the natural state, for the fish have much more living space there, which is restricted in captivity by the four glass walls of the tank. The young hatch after about 24 hours and hang from the nest. Now the male is removed as well and the water level is lowered by careful siphoning to about 15 cm. After three days the young are free-swimming and must be fed with the finest of live food. If given a healthy diet they become sexually mature after about six months.



Spawning taking place

The PORT ACARA

Aequidens portalegrensis

by Rudolph Zukal

I WILL START by comparing aquarists—the real enthusiasts I mean—to stamp collectors, if I may be so bold. For amongst their number there are not a few who always want something new, who enter an aquarist dealer's with the question on the tip of their tongue: "Have you anything new?" Some want to boast about a new acquisition, others are always trying to breed something new before going on to devote their time to yet another fish. I will freely admit that I myself belong to the second group and although I consider certain species to be my favourites, I am forever trying to obtain something new in order to try out my fish-keeping skill and test my patience. This was my experience in the autumn of 1973, when my friend Mr. Hecker from Walthersdorf, sent me a pair of these beautiful cichlids mentioned in the title.

The fish got through the relatively long car journey without mishap apart from a few damaged scales. Over the first few days in the 120 litre tank which had been reserved for them they kept mainly hidden and were very shy. On one occasion I noticed that the female had burrowed into the base medium so quickly out of fear that, if I had not been at hand, the fish would surely have died of shock. There is always a degree of risk in transporting older fish and re-establishing them again in a new environment. The danger to the fish involved is unavoidable and it is much easier to introduce young fish and raise them into breeding pairs. But, to return to our cichlids.



At the present time the Port Acara is not kept or bred at all in our republic. It is a large fish, attaining a size of 25 cm in its native environment in southern Brazil and Bolivia. My adult fish were 10 and 12 cm in size, whereby the male was the larger. Differentiation between the sexes was not easy to establish, but the female had a somewhat fuller abdomen and was a little

smaller, as already stated.

What interested me more than anything else was the fact that the fish was first imported to Europe in 1913 and the question of why until now specimens have not been kept by aquarists in our country. The answer was supplied after a few weeks, for these large cichlids, too, were no exception but dug busily in the sand, made a

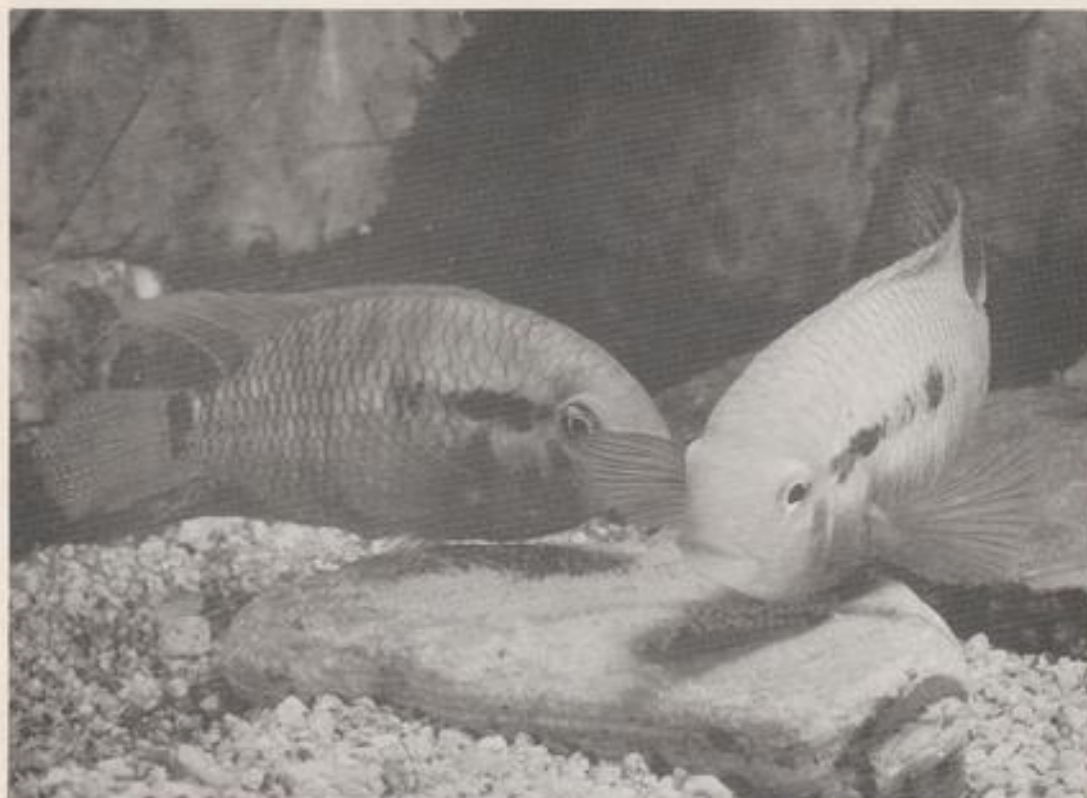


The pair by the chosen spawning site



The first eggs are laid. Extended ovipositor can be clearly seen

November, 1982



The pair spawning together

large number of depressions and did not spare the vegetation in doing so. Before the fish had settled in properly they had been very well behaved. I spent a lot of time observing them, for I considered that the burrowing in the sand was an indication that spawning would soon take place. But the spawning action took place on an oval stone.

As already mentioned, I kept the pair in a longish tank at a temperature of 26°C; the tap water it contained was neutral and showed a DH reading of 18. Relatively large numbers of *Tubifex* were not only gulped down but consumed in a very wasteful manner. After being chewed, with an accompanying bloody clouding of the water as the punctured remains of the worms were blown from their mouths. I had to introduce, therefore, quite strong aeration of the water. The actual spawning was prepared many days in advance, as is shown by the pictures.

The chosen spawning site was carefully cleaned by the female and then, when everything was ready, spawning took place. Within two hours about 500 eggs were laid, which were cared for by both adults. But, to my great disappointment the eggs disappeared on the next day. The fish were probably disturbed by something and the eggs consumed by the parents. This happens with a large number of species. So, on this occasion, I was unlucky. The next time—for the fish spawn several times a year—perhaps things will go better. To conclude, I would like to return to the theme of my introduction. It could give the impression that I consider it a mistake for something new. This is not true, for only in this way can one ensure that many species are reproduced and preserved. Cichlids, although they are not always house-trained, should be no exception, for they too are a beautiful

part of the fish-keeping hobby. *Aequidens portalegrensis* are a nuisance mainly before and during spawning, because of their digging. For this reason one should place only stones, wooden roots and suchlike on the bottom of the tank, with few plants. Although young specimens are rather aggressive, the same cannot be said of adult fish, although they resolutely defend their eggs and young. When I put my hand into the water in order to arrange something, it was vigorously attacked and I could clearly feel the pouting lips of the fish which were nipping my hand. They are omnivorous, so a vegetable element should be included in their diet. As for their behaviour, I would compare them to *Aequidens latifrons*.

Meet the Aquarist

Brian McCullough

by B. Whiteside

BRIAN MCCULLOUGH lives in a large town, situated on the coast of County Antrim, in Northern Ireland. He is 20 years old and lives with his parents and sister in a bungalow.

Brian has kept goldfish since he was seven or eight years old; but it was only four years ago that he developed an interest in tropical fish and, together with his father, finally set up a total of four tanks. Their enthusiasm waned after two-and-a-half years and they sold the four tanks; but Brian—and his parents and sister—had not completely lost all interest in tropicals. It remained dormant until January 1981 when it was renewed.

Brian learned that someone had a 6ft. tank and stand for sale and went along to see the two items. He purchased them for £55.00 and was soon back into tropical fishkeeping once again. Within a short time Brian had added a 3ft. tank and a 2ft. tank—and, most recently, two small breeding tanks bought in Blackpool.

Last autumn I loaded my camera with film, put four fully-charged batteries into my flash unit, and set off to interview Brian and to photograph his fish. Brian's enthusiasm led me to



Brian McCullough views his 6ft tropical tank

expect an interesting 6ft. tank. I was not disappointed. I saw, without question, the most attractive 6ft. tank I have ever seen anywhere in the world. It housed about 200 tropicals, of many species and a variety of sizes. The tank also contained a pleasing selection of aquarium plants; and a very natural-looking arrangement of tree branches—which had been collected from a local river after a flood. The branches had been well weathered and soaked in the river and were not fresh material. The whole aquarium was very beautiful and the collection of fish included many interesting specimens. (Incidentally, I understand that Brian has now removed the branches from his 6ft. tank.)

Photograph 1 shows Brian beside his 6ft. tank. While studying the various fish in the large tank I asked about the type of food preferred by a large catfish that kept itself well hidden.

"It loves garden worms," said Brian's father—and immediately switched on several room lights round the house and launched out into the pitch black and very wet night to try to dig up a garden worm. I failed to dissuade him; and a few moments later he

returned with a large worm which he cut into several large pieces. He threw in a couple of pieces and within seconds the large catfish shot out of the plants and grabbed a large chunk of worm. I managed to snatch shots of it grabbing the worm, and releasing clouds of mud, before it made a hasty retreat into the plants. Picture 2 shows the catfish gorging itself on the earthworm before vanishing again.

Brian likes U/G filtration because it is inconspicuous; and he favours Gro-Lux lighting. His favourite freshwater fish are catfish and sharks; and his fish like TetraMin and Phillips Superfood. He uses SeAquarium and Aquarian cures, if necessary.

Despite the darkness and rain I took a quick trip round Mr. McCullough's garden. Its 7½ft. × 5ft. × 1½ft. pond has been there for some time; but the 20ft. × 7½ft. × 15in. pond was dug only recently. The large pond contains about 19 goldfish and appropriate pond plants. I hope to photograph the ponds, in the spring, during the hours of daylight.



A large catfish chewing on earth-worm



Brian McCullough's marine tank, situated beneath the 6ft freshwater tank and flanked by two, small breeding tanks

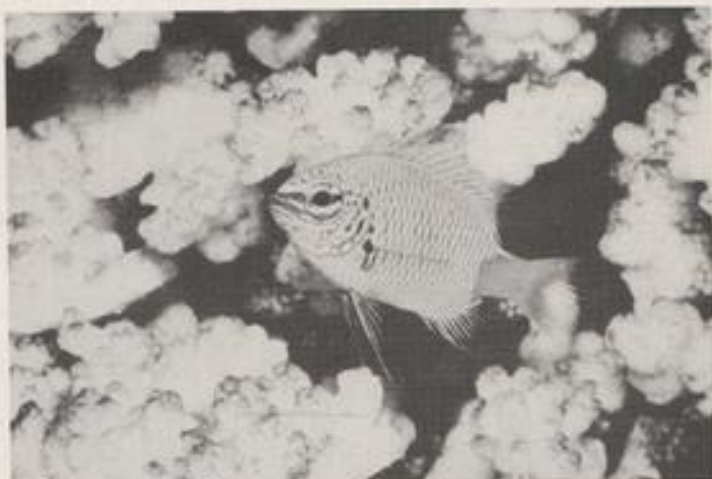
Photograph 3 shows Brian's latest passion—a marine aquarium. It is flanked by the two, small breeding tanks. The marine fish are in excellent health and Brian has had some of them for quite some time.

The yellow-tailed blue damsel in photograph 4 cost Brian £250.

Brian is fortunate in that his parents and sister also share this interest in fish—which is obviously why a portion of their home and a large part of their back garden are given over to housing fish. On occasions, Brian's sister has bought some fish for the collection; and Mr. McCullough is just about as keen an aquarist as Brian. Recently Brian's girl friend bought him an attractive book about tropicals—which indicates that he has also converted her into an aquarist.

I asked Brian what he would like to add to his collection next. At the moment he is very keen on marine fish and would like to buy a marine angel—if he could afford it.

Plans for the future? Brian told me that he would like to open an aquarium shop of his own. His enthusiasm is such that it will not surprise me if he manages to do so in the future. I hope he achieves his ambition; and I



Yellow-tailed blue damsel beside coral

should like to thank him for permitting me to interview him and photograph some of his beautiful and interesting

fish. Brian may yet persuade me to try marines—but I still have my doubts!

A personal development of filtration in marine aquaria

By David Marshall

WHY should we want to change the way we filter our marine aquariums? The undergravel filter system that 90% of marine aquarists use is both efficient, easy to run, and maintain and is easily purchased and fitted. The most common complaint is that these filters are noisy, but with the advent of reasonably cheap water pumps, and now power filters, the undergravel filter can be made to run in near silence. It can also be made to run in reverse flow with the use of a good power filter, plus take a very high load rating, enabling even a three foot tank to hold a fair show of fish. They are, in the opinion of many marine aquarists, the only way to successfully maintain a marine aquarium for any length of time.

I was, myself, and still am, an avid supporter of undergravel filters, especially the high turnover air-operated type pioneered by G. F. Cox.

I have used this type of filter for eight of my nine years of marine fish keeping.

Regardless of whether they are water or air driven, normal or reverse flow, they all have the same faults. By their very action they pull the dirt, food particles, etc. into the sand or gravel, trapping them there. Indeed, this and the bacteria that grows there, is what gives the undergravel filter its great efficiency (see Fig 1). This also gives it its biggest drawback, the build up of dirt or sea humus which gradually chokes the filter bed thus impairing its efficiency.

My tank was first emptied and the livestock re-housed. Rocks, Coral, Sand and Gravel and the existing undergravel filter were then taken out.

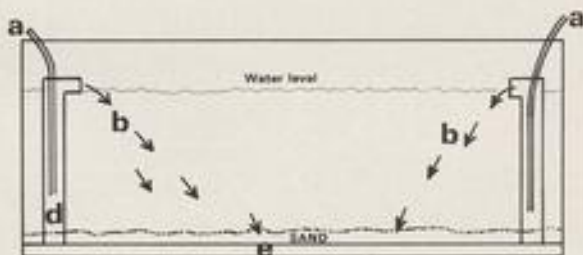
The tank was cleaned and filled to capacity with a new mix of Synthetica.

No Rocks or Corals were added at this time as it seemed pointless to decorate it if the filter did not work and it had to be stripped down again. I then set about drilling the holes in the Plant Trough; there were of course, drainage holes, but I found these inadequate for my purpose. After a few experiments I found that 36-1" holes in the bottom were enough for the turnover that I would obtain from two Schwarzer 302 SL air pumps, one to each air lift tube. The bottom of the box was covered in a layer of coarse foam, followed by a 2 inch layer of sand; this was in turn covered by another layer of foam.

It is important that the layers of foam and sand are below the level of the uplift openings. This is so that the water is first filtered by the top layer of foam before it reaches the sand where it forms a biological filter, just like an undergravel filter. The bottom layer of foam has a two-fold purpose, one to act as a barrier to stop the sand falling through the holes, and two, more important, to prevent the water cutting channels through the sand and therefore giving even filtration right through the sand in the box.

The box was then matured with a Sea Mature kit, after which, three-one inch *Monodactylus argenteus* were added. Four months later, and no problems, a three inch Sail Fin Tang was introduced, by this time the Mono's had doubled in size, giving eleven inches of fish overall. The nitrite and pH at this time were nil and 8.3 respectively. Over the next four months I added a 4 inch Bicolour Parrot Fish, a three inch Three Spot Angel, a one inch Rock Beauty (*Holocanthus tricolor*) and a one inch

Fig. 1



The only way to remove this humus from the filter bed is to turn off filtration and stir up the bed to bring the dirt back into suspension, where it can be power filtered out. If a power filter is not available, you must wait for the dirt to settle before syphoning it off and replacing the water. A good time to do this is when the water change is due. This problem is not so bad in reverse flow systems (see Fig 2) although it is still there.

The object of reverse flow is that only clean filtered water is delivered under the plate, and therefore through the sand, while the dirt, food particles, etc. are trapped in the filter body.

- a Air Supply
- b Returned Water
- c Food dirt particles
- d Uplifts
- e Filter plate

Continued on page 43

THE AQUARIST

THE MAKING OF A WATER GARDEN

Part 5

marginal and bog plants

by Gordon T. Ledbetter

OFTEN the reason for building a pond is to grow water-lilies, *Nymphaea*. However, lilies tend to bloom only during the summer months. The range of colour and form, and the flowering season of the pond can be greatly extended by a judicious choice of marginal plants.

For this reason I equipped my two ponds with a couple of bog beds. More strictly they are bog trenches. As I explained in a previous article, a ledge was cut the whole way round the two ponds. Then using natural stone I made perimeter walls within the ponds along the edge of these shelves. The walls then created a trough with the surrounding bank—the whole ponds had, of course, been lined first of all, in this instance with Butyl rubber—and I had only to fill the troughs with soil to make a bog garden. If you want to do the same I suggest you make the trough about 25 to 30 cm deep (about 1') and vary the width if your pond is an informal one, a width of between 30 and 60 cm (1' to 2') provides plenty of room. One point should be noted in particular. As the trough is just about at water-level it is only suitable for growing plants which will tolerate having their roots saturated with water. Polythene lined trenches outside the pond should be used for plants which require damp or moist but not saturated soil.

In making a selection of bog plants I was guided primarily by the desire to have something in flower from early spring until the end of summer and indeed into the autumn. But there were other factors to be taken into account too. The naturalness of a pond with a stone edge can be greatly enhanced by using plants which creep over the edge and dip into the water. This means prostrate plants or at least floppy ones; but a pond which had only low growing bog plants would lack a whole dimension. Upright plants add grace and elegance to a water garden, and they add to the depth of the

pond by their stately reflections. Moreover tall plants, by which I mean marginals up to a metre in height—they do not have to be huge—somehow add to the sense that the pond has existed for years, despite the fact that many marginals only require a season or two to develop. A third consideration was to break up the plain greens with some variegated plants. So, having decided upon a combination of high and low growing plants over a long flowering season, I had one consideration left. I have, as many gardeners have, a particular love of irises and I wanted to have as many kinds in full bloom at the height of summer as possible.

To begin the season as early as possible one cannot do better than choose the Marsh Marigold, *Caltha palustris*. It is often called the harbinger of Spring. The Italians have a good name for it which well describes its brilliant yellow flowers. They call it *Sposa di Sole*—Spouse of the Sun. They last an age too, opening often in March and surviving on to the end of April with some blooms still beautiful in May. The double form often flowers a second time and there is a small white form from the Himalayas. They look best, I think, when kept quite separate. All will conceal an ugly concrete rim or simply soften a hard edge.

So will the Bog Bean, *Menyanthes*

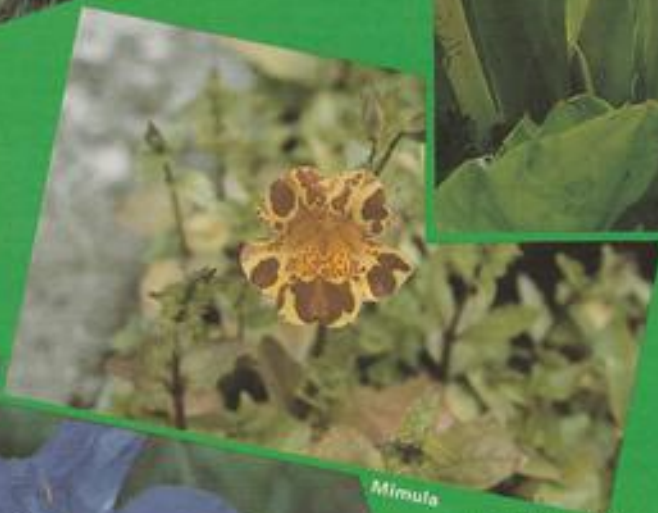
trifoliata, whose little white crested flowers open a little later than those of the Marsh Marigold. Even the red buds of the Bog Bean are attractive, and the foliage varies from dark red, the stems especially, to dark green. This plant likes nothing better than to spread out across the water, twisting and turning as it goes. It is very prostrate in its growth habit. In complete contrast is another spring flowering marginal, the American Skunk Cabbage, *Lysichiton* (also spelt *Lynichiton*) whose flowers (strictly speaking they are spathe) open before the leaves develop. *L. americanum* has yellow flowers and grows to about a metre in height. *L. camtschatcense* has white flowers and is a slightly larger plant, but neither form will necessarily attain its full height. Both plants like plenty of deep soil. Grow your primula in the shade of their broad, bright green leaves. Still with Spring in mind, you might add the Golden Club, *Orontium aquaticum*, to your list. I grow this plant as both a deep water aquatic when its strap-like leaves float across the water, and as a marginal. It is equally happy in either situation but requires soil at least 30 cm (1') deep. In a way the plant is only shown at its best as a marginal. The undersides of the leaves are a silvery colour and in even a slight breeze the Golden Club has a lovely shimmering appearance. The flowers



Golden Club



American Skunk Cabbage



Mimulus



Iris Kaempferi

are striking. Yellow heads on long white stalks; they resemble giant matchsticks.

Summer brings among so much else the irises. Our own native Yellow Flag, *I. pseudacorus*, can hold its own for beauty with any plant. But it needs to be kept within bounds. The variegated form is less rampant. Do not be alarmed if it loses its cream stripes before the end of summer. It usually does. The plant has not,

Continued on page 50

YORKSHIRE AQUARIST FESTIVAL

1982



Pocklington A.S. came a close second with this model of a fish house



The 'Betta Pet-Roleum Filling Station' which deservedly won first prize in the Tableau section for Sheaf Valley A.S.



This 'Greenhouse' won third prize for Ashby A.S.



A colourful exhibit beautifully constructed by Darfield A.S. won them fourth prize

Full report overleaf

The Yorkshire Aquarists' Festival goes from strength to strength.

The tableaux may have been a little smaller than in previous years—no doubt due to the depression biting a bit deeper into our pockets—but the quality was evident and the actual numbers of societies exhibiting was on the increase.

Biggest boost of all came in the 'Fish of Fishes' section. This year there was a record 28 entries which was more than double last year's numbers.

On the trade side there was plenty to catch the eye with stands from most of the country's leading retailers and manufacturers. There was little in the way of new developments, however. One or two folk did say that they have a few things up their sleeves but they were waiting until the trade show early in October to reveal all. Others like Keith Barraclough said that they were now in a period of consolidation rather than expansion.

The organising committee of the event were of course delighted with the response from both the general aquaristic public and the trade. The crowds poured in steadily over the two days and many traders were confident enough to book space at the 1983 show.

Chairman Brian Boyden pointed out that it was important in other respects as well.

"I think we had a great festival", he said.

"This year we pulled down walls that have probably existed in the past. There has been a social gathering of the YAAS and the FNAS and we have hosted a joint meeting of all associations."

Societies had really pulled together to make the show a memorable one and although all the bills weren't in yet the feeling was that it had been a good show financially as well.

"The tableaux were a little smaller this year," said Brian, "but this enabled us to concentrate all the show in the main central area."

"Everyone who holds exhibitions here hates the north wing because it is rather cut off so a more compact show seems to please everyone."

Although size was sacrificed, quality



An early morning view of part of the Exhibition Hall before it was invaded by thousands of enthusiasts

seems to have been the byword instead with Sheaf Valley taking the top prize with the 'Beta Pet-roleum' filling station. They were chased by Pocklington's fish house and the Ashby Fishkeepers who came third. Fourth were Darfield and fifth Bradford and district.

Quality was also in evidence in the fish exhibits—which after all is what the show is really all about.

Show Secretary Norman Bolton was highly delighted with the response to, and the standard of, the Fish of Fishes.

"It was marvellous," he said. "The top three exhibits scored 87½, 84 and 81, and the lowest on show was pointed at 71½. Best in show picked up 84 points and the overall high standard made it a difficult show for the judges."

All the Yorkshire Association's nine 'A' class judges were on duty on the day.

"We are already thinking about next year's event," said Norman a few days after the show. "Trade space is holding steady and we have new traders wanting to come in and regulars already booking space for next year."

"Our trade furnished aquarium con-

This impressive exhibit from the YDAS nearly went through the roof!!

petition, went down well and we already have one or two new ideas lined up for next year. . . ."

As I said at the beginning, Yorkshire is a show which goes from strength to strength.

Continued from page 38

Fig. 2.

To my mind the reverse flow system has two drawbacks: the turnover of such filters is not usually as fast as an air operated unit and they are much more expensive to install and run. A spare air pump is one thing but a spare power filter is quite another.

It was with these advantages and disadvantages in mind that I decided to construct a filter incorporating the following three points:

1. The bacteriological functions and high load ratings of undergravel filters.
2. Air operated if possible.
3. To be simple in operation and simple to construct and service.

After one or two false starts I came up with the following:

First, it became obvious that any



internal type of filter is unsatisfactory, as it could not provide the area for biological stability. An outside filter would cause problems with pipes and boxes, etc., therefore the only place left for me was above the water level of the aquarium. (see Fig 3).

- a Clean water from Power Filter
- b Power Filter
- c Power Filter inlet for dirty water
- d Uplift
- e Filter plate

Blue Damsel Fish. This gave twenty inches of fish overall, comparable stocking to that with a conventional undergravel unit.

The filter at the time of writing (September 1981) has been running for nine months and to my mind, given a good account of itself.

I found it cheap to run and maintain as the top layer of foam can be rinsed out as often as desired (with surprising results), the sand can be washed out in old sea water when doing a water change.

It also seems to give a better air to water exchange, thus less carbon dioxide—higher pH.

If some of the newer writings on oxygen consumption by the bacteria in undergravel filters are correct, approx 80% of all available oxygen being consumed by the bacteria, then the reduction of sand weight to fish ratio should be a good thing. Indeed, my own fish have a slower gill count than those in normally filtered aquariums belonging to my friends, indicating to me the presence of more free oxygen in the water.

If by some chance one pump fails, the remaining one would be sufficient to maintain a constant flow of water through the entire filter bed; also if the

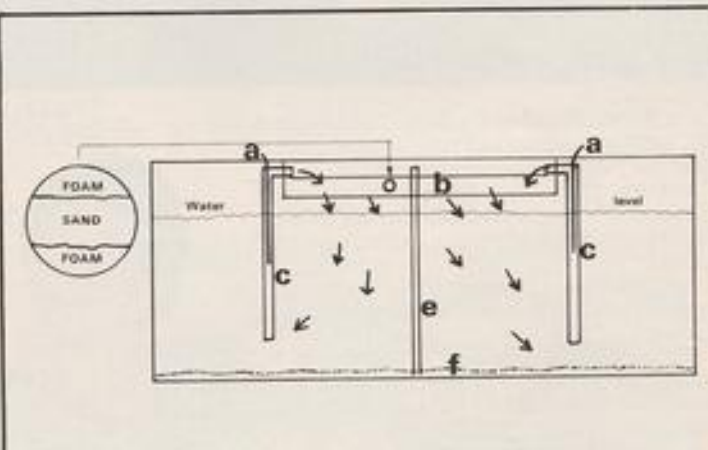


Fig. 3.

After trying various containers I finally settled for a plant trough measuring 24 x 6 x 5 inches; the size of this would of course have to be altered to suit individual aquaria and available head room. The width of the box is also important; if too wide it will shut out too much light.

- a Air supply
- b Filter box containing foam sand foam
- c Uplifts
- d Returned water
- e Overflow pipe
- f Small covering of sand 1/2 in. deep

bed was to get blocked with dirt the water would simply run back into the tank via the overflow. There may be drawbacks with this system, and a few points I have not explained in full. If there are, please forgive my enthusiasm for the good points in my system at the

expense of more explicit description.

Overhead sand filters are not new, and the idea is not mine. This is just my own development of the idea. My main interest in fish-keeping now is the development of the equipment, and a full understanding of the fish I keep.

PRINCIPLES OF BREEDING BREEDING

by
Frank Orme

Part 1

IN ORDER to improve the quality of any stock by its breeding it is necessary to choose the genetically right adults and apply a system of selective breeding to the future generations. A basic understanding of genetics will greatly assist any stock-breeder to apply the correct principles, and this applies to fish just as much as to the race-horse.

In 1865 Johann Gregor Mendel, a Moravian monk, read a paper to the local Brunn—a society of historians and naturalists—in which he described the experiments, and results, of his research into inheritance. Over a period of eight years Mendel planted and crossed several varieties of common garden peas and carefully recorded the differences

which occurred over several generations. Although the paper was published it was not widely distributed, and was subsequently lost. Mendel's theory of inheritance, which contained the fundamental laws upon which all advances in genetics have been based, gathered dust for thirty-four years, and it seemed that one of the most important discoveries of the nineteenth century had been lost to mankind for ever. However, in 1900, sixteen years after the death of Mendel, the paper was rediscovered and his marvellous work was presented to the world.

Heredity

During his experiments with the peas, Mendel had discovered and identified the units of heredity. He found that if he crossed two individual plants, each with different unit traits, one trait appeared in the offspring and one did not. He called the visible trait the 'dominant' trait, and the one which was not visible the 'recessive' trait. Mendel suggested that traits, such as colour, are trans-

mitted by units in the sex cells and that one of the units must be pure, either black or white, but never a mixture of both. From a parent which is black, and pure for that trait, only black units will be transmitted, and from a parent which is pure for the white trait, only white units are passed down. However, when one parent is black and the other white, a hybrid is produced which will transmit both black and white in equal amounts. The hybrid itself will exhibit the colour of the dominant parent, yet carry the other colour as a recessive. It was discovered, from various combinations of crosses, that there were six possible ways in which a pair of units could combine with a similar pair. The accompanying chart shows how the Mendelian law operates and the expected results. This law holds true in the breeding of all living things—of plants, mice, humans and fish and all things capable of cross-fertilization.

In animals life begins during the process of breeding when there is a union of a male sperm and a female egg cell. The sperm cell has a nucleus containing one set of chromosomes, which are small units of inheritable material. Each egg also possesses a nucleus of one set of chromosomes. The life created by the union of the sperm cell and egg cell then has two sets of chromosomes—one from the father's sperm and one from the mother's egg. Herein is the secret of heredity. For in the chromosomes lie the living genes that will shape the unborn young, and these genes are the links which connect the new life to its ancestors.

The genes resemble long, paired strings of beads. Each pair is alike, yet differs from the like partners of the next pair. Although this holds true for the female, the male is slightly different in that there is one pair of chromosomes composed of a pair which are not alike. These are the sex chromosomes which, in the female, are designated XX, whilst in the male they are designated XY. If the single male X chromosome unites with the female X chromosome, the resulting embryo will be female. However, if the sperm carries the Y chromosome,

and fertilizes the female X chromosome, the resulting embryo will be male. Apart from the sex chromosomes, the other chromosomes will directly influence such factors as colour, scale type, body shape, finnage length and shape, and so on in the fish.

The resulting fish is what the controlling genes have made it. The adult male and female have each contributed one gene of each kind, and this gene which they have given is but one of the two which each parent possesses for a particular characteristic. Since these have been drawn at random, they can be either dominant or recessive genes. The dominant, inherited features will be evident as the fish develops; however, the recessive traits, although carried as part of the genetical make-up, will be hidden.

Rules

There are rules which govern the dominant and recessive traits, based upon present-day knowledge of the subject. For instance, we can be reasonably sure that a dominant trait: (1) Does not skip a generation. (2) Will affect a relatively large number of the young. (3) Will be carried only by the affected fishes. (4) Will reduce the risk of continuing undesirable

characteristics in a strain. (5) Will make the breeding formula more positive in the improvement of stock.

With recessive traits it is found that: (1) The trait may skip one or more generations. (2) On average only a small percentage of individuals will carry the trait. (3) Only those individuals which carry a pair of units for the trait, exhibit it. (4) Individuals which carry only one unit can only be ascertained by breeding. (5) The trait must be passed by both parents to the young.

Because they are living cells in themselves, the genes can and do change or mutate. It is suspected that there are many more gene mutations than was formerly believed, but that the majority are either within the animal, where they cannot be seen, or are so small that they are usually overlooked. Dramatic mutations which are clearly visible are the ones which are noticed, and we select for or against according to whether the new factor helps us towards our ultimate goal or away from it. Unfortunately, with the vagary inherent in all living things, mutated genes may well change once again back to their original form.

At times one hears it claimed that either the male or the female is the

dominant fish and will produce fish similar to itself, and should therefore be the better quality parent. Obviously this is not true, unless it carries the dominant genes, because each of the individual young fish will have received 50 per cent of its germ plasma from each parent. It may be that the genes of one parent may be so dominant that the bulk of the young appear to have received all of their inheritable material from that one parent, and the particular parent could be either the male or the female.

We now know that the progeny of any breeding pair are the product of their own germ plasma, and this has been handed down from generation to generation. We also know that some genes are dominant and others are recessive, and that the visible dominant genes prevent the recessive gene showing. It must be remembered that it is not the fish itself which is dominant or recessive in colour, form or any other characteristic. It is the gene that is dominant, and this can only be judged by results.

If we hope to improve the quality of the stock which we produce we must understand how to apply genetics to our breeding programme. Without having some knowledge of the genetic make-up of the fish we intend spawning we can only trust in luck.

Start with quality

There is an answer to the problem. Obtain good quality fish with which to commence, and record the quality of the young produced, relating the good and/or bad points back to the individual parents. This should help to establish which, if either, of the adult pair carries the dominant genes—which may be good or bad. From the young select only those fish which exhibit one or more of the desired points, and dispose of all others. When the chosen few are, in their turn used for breeding, continue to keep records, listing the results obtained. In this way a genetic picture will become plain, and the fish selected and bred accordingly.

In the next article various breeding methods will be covered.

Male & Female	Progeny
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Mendelian Chart



SPOTLIGHT

The HUMP~BACKED LIMIA (*Poeceilia nigrofasciatus*)

by Jack Hems

THIS species, known to science between the two world wars, and for some time after, as *Limia nigrofasciata*, is native to the island of Haiti. Members of the genus *Poeceilia* are, of course, livebearers. In *P. nigrofasciata*, both sexes look much alike, that is in coloration if not exactly in general outline and build (at full size).

In the main, the species is dark olive brown on the back, with a steely blue sheen on the shoulder, shading down to brassy yellow which gives way to white near and around the underparts. Some eight to twelve narrow black vertical bars extend from the rear of the gill-covers to the root of the tail. Viewed in a good light, the scales glimpsed between the bars are tinsel-like with lights of green and gold. In some specimens, the spaces between the bars are lightly or heavily peppered with minute black dots.

A singular feature of this fish is that as the male approaches maximum size—about 2 in.—his sides grow taller and, at the age of about one year, the forward part of his back develops a hump. Then again, a goodly part of his underparts, including the rod-like gonopodium (a modified sperm channel peculiar to livebearer males) become suffused with black. His dorsal fin, too, increases in size and beauty of colour: a rich yellow in the soft parts and base, and black along the rays. The caudal fin is marked with black around the margins.

A full grown female measures about 2½ in. and, in general, her fins are neither so well developed nor anywhere near so ornate as those of a full grown male. Yet until this species grows to a fair size, it is not always easy to tell the sexes apart, for the rod-shaped anal fin of the male is not always instantly apparent in young fish. It is to be remarked, too, that as *P. nigrofasciata* are always on the go, sexing becomes quite a problem for those not blessed with first class vision or not able to keep the fish in focus for a moment or two.

P. nigrofasciata is not sensitive to changes in temperature, provided they are brought about very gradually. Ordinarily the fish has a temperature range of about 65°F (18°C) to 86°F (30°C). It flourishes best, however, at a temperature of about 72°F (22°C) to 75°F (24°C). A tank measuring about 18 in. × 12 in. × 12 in. makes a comfortable home for a pair of this species. It should be three-quarters filled with water—the species breeds best in rather shallow water—over a clean sharp sand or fine grit floor.

Among the most suitable plants to furnish cover for the oft-repeated broods of fry are the lacey-fronded *Ceratopteris thalictroides*—massed at the ends of the tank to form curtains

of thick foliage—*Limnophila heterophylla* (*Ambulia*), and warm water forms of species of *Myriophyllum*. There are others, and reference to W. Vivian De Thabrew's book on *Popular Tropical Aquarium Plants* will indicate to the aquarist their virtues as fry-savers.

The owner of a pair of *P. nigrofasciata* will not be taken by surprise when a female is about to deliver a batch of young because several days before the event her abdomen, normally dark and well-rounded, becomes highly distended and deep blue-black in colour. She will also tend to avoid the male by hiding away in corners or among a camouflaging screen of plants. From a single copulatory act on the part of the male, the female may give birth to several batches of young. The time-lapse between broods is determined by the temperature of the water; but generally speaking, at a temperature of 75°F (24°C) there is an interval of some five to six weeks (or even ten weeks) between broods. The number of fry produced by a female can be as many as fifty or thereabouts, or as few as fifteen or twenty. It all depends on the size of the female, and also her state of health, and age. A large female in her prime—about nine months to a year—will invariably produce large broods. As fry are ejected from the genital opening they make haste, that is most of them, to reach the surface. The object is to fill their air-bladders with an initial gulp

SPOTLIGHT



of atmospheric air. The weaklings—and there are always a few—make a brave struggle to the surface: some make it, and continue to live for a few days. The rest do not, and just spiral to the bottom, dead before they reach it, or dead soon after they reach it. Their healthy brothers and sisters, a uniform grey with faint vertical barrings, endeavour to make themselves scarce in the vegetation where they feed right away on any minute animal life available (there's always some in old water

taken from an established tank). If the parent fish are kept will supplied with food, especially live food such as whiteworms, gnat larvae, well-grown brine shrimps, and the like, they will not be much tempted to indulge in cannibalism. Meanwhile minute amounts of a dust-fine proprietary fry food should be sprinkled on the water to nourish the youngsters. The fry grow fast, and added size encourages them to venture every so often into open water (but ever ready to rush back into the greenery if the parent fish draw near) and there snatch at large food such as crushed flake or small live food missed by their parents.

It is not advisable for the aquarist to net a female in an advanced stage of pregnancy. The shock often results in (a), premature birth of the fry, (b),

death of the fry before delivery, or (c), rapid decline and consequent death of the unfortunate female. If one of the pair is to be removed in order to save more fry (leaving aside special 'breeding cages' sold by dealers), it is recommended to remove the male to another tank and leave the female on her own. One can divide a tank down the middle with a sheet of glass cut to size. This divider is or may be held in a vertical position by flat strips of lead bent over the sides of the aquarium.

Ordinarily *P. nigrofasciata* has a life span of about three years and is mild-mannered enough to share quarters with other peaceable fishes. It has two popular names: the Hump-back Limia is the one most often used. Striped Limia is the other.

The making of a water garden

continued from page 40

however, reverted. Come next spring and the creamy stripes will reappear on the new leaves. The American Flag Iris is almost identical to our own except the flowers are blue. *I. versicolor* grows best in very shallow water or moist soil. The Japanese *I. laevigata* is a true water iris and produces magnificent navy flowers, and there are many fine crosses besides. If you can provide slightly acidic conditions you will certainly want to grow *I. kaempferi*, especially the higo strain which produces massive double flowers. *Kaempferi* also likes rich soil well fortified with manure. On the other hand few irises or indeed plants are less particular than the lovely *I. sibirica* which is available in many shades of blue as well as white and even carmen. Of course it will appreciate a dressing of

leafmould and likes good loam, but I have often grown *sibiricas* in poor situations and been gratified with fine blooms year after year. I like the grassy foliage too which quickly forms dense clumps. You can grow *sibiricas* in a few inches of water or in an ordinary bed provided it does not dry out. I have my *sibiricas* both in and out of the bog trough, so that their flowering period is spread out.

The Water Forget-Me-Not, *Myosotis palustris (scorpioides)*, is well worth growing for its small but bright and conspicuous blue flowers. It is very variable in height depending upon conditions, but it likes moist soil or a few centimetres of water. It spreads quickly without ever becoming a nuisance. *Mimulus*, the Monkey Flower, prefers moist soil although some, including the widespread *M. luteus* will tolerate very shallow water. Breeding has produced all sorts of fiery and spotted varieties which bloom all summer long. *Mimulus* make a great display and can be used to fill up vacant spots between other plants, and they set seed easily. The Water Mint,

Mentha aquatica, with its purplish blue flowers also has a long flowering season, and you can pluck the leaves to flavour your potatoes. The smell of mint, in any case, is worth having as it wafts its way across the pond (though it becomes really pungent only when crushed). The Pickerel Weed, *Pontederia cordata*, with its bristle brush blue flowers adds colour to the end of summer. Grow the plant in large clumps as the individual flowers are not very conspicuous.

With the last of the *Mimulus* and Pickerel Weed the flowers of summer come to an end. But there is one autumn flowering plant that everyone loves: the so-called Bulrush of *Typha*. You can save yourself a lot of trouble by resisting the temptation of growing *Typha latifolia*. It is too vigorous for anything but the largest ponds or lakes. *T. angustifolia* is more amenable, but the little *T. minima* is the obvious choice for the garden pond. The poker heads of *Typha* turning from green to yellow and then dark brown and reflected in the autumnal stillness of the pond is one of the delights at the end of the season.

Book Review



The Care of Reptiles and Amphibians in Captivity, by Christopher Mattison. Published by Blandford Press, Link House, West Street, Poole, Dorset BH15 1LL. Price £8.95.

Christopher Mattison is an associate of the Institute of Animal Technicians and chief technician in charge of animal services at the University of Sheffield. He draws upon his personal experience to instruct and help the reader to provide his charges with the responsible, caring attitude they re-

quire. Over two hundred species are dealt with in the matter of their management, forty eight illustrated with the author's own excellent colour photographs with another fifty of his black and white photographs.

The first of this book's two parts supplies information on making a start in the hobby of herpetology, detailing principles of general care, accommodation, temperature, vivarium furnishing, foods and feeding, breeding, diseases and handling. Part two provides notes on the management of over two hundred species.

There is a widely held interest in this much neglected branch of the animal kingdom and a marked dearth of literature dealing with the subject of care and maintenance in captivity. Tortoises and terrapins, in particular, are the frequent subject matter of queries received at these offices. These creatures are imported on a large scale and offered to an eagerly receptive public, juvenile specimens being easily obtainable but less easily cared for without some basic knowledge which this work painstakingly provides. Periodicals specifically for the herpetologist are almost non-existent and while this magazine endeavours to supply features in this field, a good handbook for the enthusiast is much needed and, with this publication, is now available.

As the author points out in his introduction: "Many species of reptiles and amphibians are threatened with extinction. . . As the vast majority of animals in the pet trade are taken from (these) dwindling populations,

vivarium keepers have a moral obligation to care for their animals in a serious and humane way, and not to look upon them as easily replaced novelties."

Regular readers will be familiar with the author's writing from articles in this magazine and it is hoped to include more in the future to help satisfy the needs of the many amateur herpetologists for whom such articles are in short supply. Herpetology is a specialised study but can be enjoyed by aquarists in concert with their fishkeeping pursuits, especially where pond fish provide the main interest.

LAURENCE E. PERKINS.

The Better Water Gardens Book of Patio Ponds. By Gordon T. Ledbetter. Garden trade orders; Beta Water Gardens, Blagdon, Avon. Other orders from bookshops or:- Alpha Books, Sherborne, Dorset. 44-95.

Twelve chapters, a wealth of colour photographs, three appendices dealing with technical details of patio pond construction, and a good index among other things, go to make this hardback book of 128 pages an important contribution to water garden literature.

In the first chapter, the author, a much experienced and widely acclaimed authority on the garden and water in the garden, states: "A pond legitimises a patio in a way that I think no other feature can. You can sit round a pond (patio), drink by it, eat by it.

Continued on page 61



AMPULLARIA

The Apple Snail
by Frank Gray

IN LAST January's 'Coldwater Jottings' I mentioned that in the not too distant future I would write an article about the Ampullarias or, as they are more commonly known, the Apple Snails. This I now intend doing in the hope that readers will find it interesting, and perhaps even decide to try keeping a few of these interesting, large aquatic snails. However, I must first give due credit to Mr. Walter Pagels of San Diego, California, U.S., who gave me much useful information about these creatures. He has, in fact, raised *Ampullaria gigas* for many years, and believes he is the only person in the U.S.A., who cultivates this very large snail—it is the largest of the world's freshwater snails, and grows to a diameter of around 5 inches.

There are four species of *Ampullaria*, although to be scientifically correct this genus should be called *Pomacea* and not *Ampullaria*, the latter more properly applying to old-world species which have a thicker, tougher operculum. *Pomacea* means apple-like, whereas *Ampullaria* has reference to a jug; however the latter title has continued in popular usage and will, therefore, be used in this article although not strictly correct. The four species are: *A. gigas*; *A. paludosa*; *A. canaliculata* and *A. cuprina*. All have roundish shells with spirals, and an operculum—a trap-door-like device which seals the opening after the snail has withdrawn into its shell. Identification of the individual species is fairly simple and is as follows:

A. paludosa has a low, flattish spiral with no channel separating the shell spirals.

A. cuprina has a raised spiral without a separating channel.

A. gigas has a low, flattish spiral with a deep channel between the spiral whorls.

A. canaliculata has a channel and raised spiral to its shell.

The main thing is to be able to identify *A. cuprina*, for the others will very quickly denude an aquarium of all plantlife. Nevertheless, the others are useful for the production of *infusoria* and as curiosities for their gluttony. There is a most attractive albino form of *A. cuprina*, which is quite popular with some American aquarists. It has a nice peach coloured shell and is very prolific. *A. cuprina* and *A. paludosa* produce pinkish egg-masses, whilst those of *A. canaliculata* are coral-red and those of *A. gigas* a greenish colour.

The *Ampullaria* snails originate from tropical South America. Their large globular shells are quite attractive and may be nicely striped. Due to the fact that they have a breathing space which is divided to form a gill-space and a lung, these snails are quite capable of living for some time out of water. Their foot is wide, and the head carries two lip feelers and two very long main feelers. At the base of the main feelers are the eyes, on stems. All are quite capable of moving quite rapidly, and appear to be able to sense food from a comparatively fair distance and quickly locate it without any apparent difficulty. All four species prefer warmish conditions, preferably a temperature of not less than 70°F. (21°C.), although they can withstand cooler water down to 60°F. (15.6°C.) for shortish periods. At these lower temperatures they become inactive and will eventually die, if the period is too prolonged.

Ideally these snails should be provided with spacious accommodation in their own aquarium, in fact Mr. Pagels suggests that *A. gigas* should be allowed a minimum of 15 gallons for each snail because of the large size. The aquarium should be covered otherwise, because of their ability to breathe atmospheric air, they may climb out and fall. If the fall is any distance it will, more than likely, result in the snail breaking its shell.

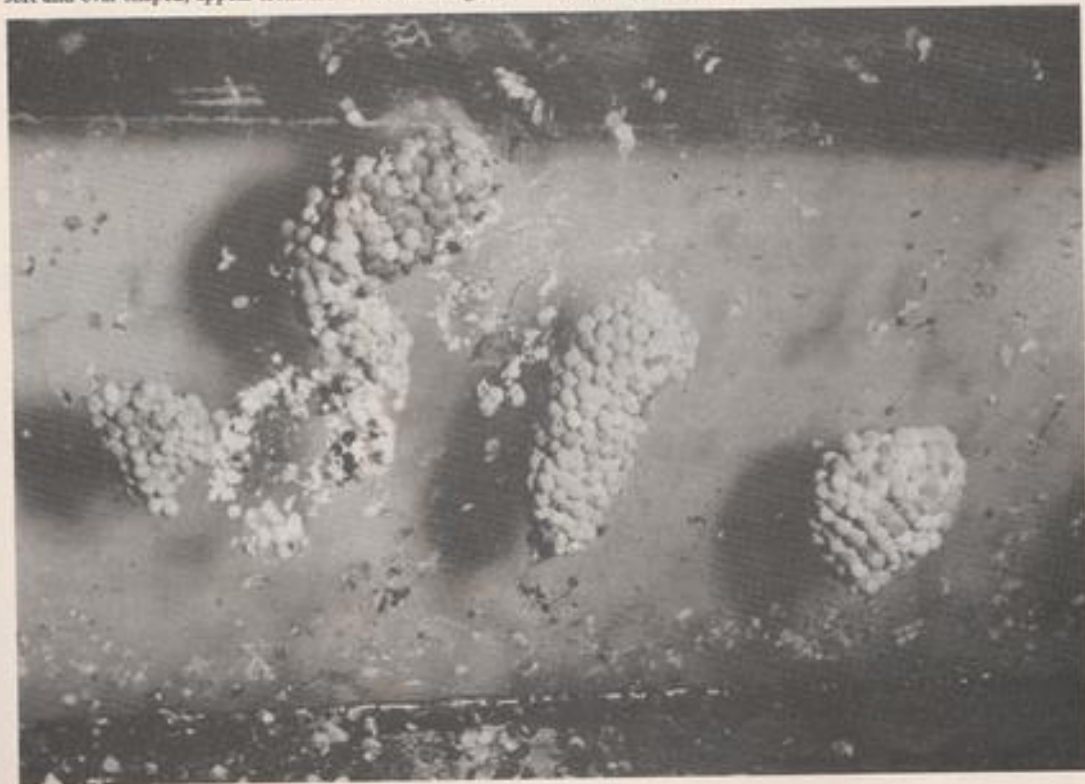
All species are great gluttons and scavengers. They will consume fish food and algae; however, they should be well fed with supplementary foods. Lettuce leaves, boiled cabbage and sprouts will be quickly disposed of, as will cooked oatmeal, canned cat or dog meat-foods and dead earthworms. In fact there is little that they will not eat, within reason, provided that it contains no seasoning. Due to the heavy feeding it will be found that their droppings will encourage the production of *infusoria*, and thus they can provide a useful source of the minute livefood which is required by fish fry in their early days. Periodically the base of the aquarium should be siphoned over, in order to remove the excessive droppings, and approximately half of the water replaced with fresh water. In this way the tank will remain sweet and free of any odour. It is perfectly possible to keep down the amount of *infusoria*, and preserve the clarity of the water, by introducing a few live *daphnia*, but only if there are no fishes sharing the aquarium. If well fed *A. cuprina* species is, perhaps, less likely to attack growing plants than are the other species of Apple snail; even-so the vegetation will be at risk.

These snails crawl out of the water to lay their eggs, which is another reason for ensuring that they cannot escape from their tank, and lay a quite large, longish egg cluster above the waterline. The eggs, which at first are soft and oval-shaped, appear from the front centre right of

the shell opening, and quickly travel across the extended body of the snail. Although it is not possible to see just how the snail accomplishes the feat, the eggs are arranged into fairly regular rows. The snail slowly works its way down, from below the cluster, laying about two eggs every two minutes—the eggs emerging singly, one at a time. The entire procedure taking anything from two to three hours to complete. Depending upon the temperature, the eggs will begin to hatch in approximately one month and the young snails will drop into the water where they will immediately commence feeding. However, if the air is too humid, allowing condensation to form upon the eggs, or if the air is too dry, there is less likelihood of the eggs hatching successfully. The ideal temperature is around 80°F (26.7°C) and, if a small air space is left between the cover-glass and the aquarium walls, there should be no problem in successfully hatching out the young snails.

Ampullaria snails are quite hardy if allowed sufficient space in which to develop, and are provided with adequate food and warmth. Their water will provide the fish breeder with a ready source of *infusoria*, which can be siphoned into a container and then poured into the fry tank at regular intervals. This facility alone warrants the keeping of a few of these most interesting, large snails.

Egg-clusters of *Ampullaria* snails laid above the water line in an aquarium



Your questions answered...

Tropical terrapians . . .

Can you give me some information on how to care for my two small red-eared terrapians?

These reptiles must be kept warm and away from drafts. A water temperature of about 25°C suits them best. This almost invariably calls for the use of an aquarium heater-thermostat and keeping these animals at very much cooler temperatures will result in problems. Small aquaria make ideal homes for terrapians. In an unheated room during the colder months of the year it may be necessary to also use a hood or coverglass. This will exclude drafts, reduce evaporation and keep the above water temperature comfortable for the inmates. During the warmer months the hood may be removed and the terrapin allowed to bask in natural sunshine. For this purpose a dry easily accessible, sunning area should be available in the tank. This may take the form of a smooth rock or a piece of floating tree-bark. Rough rocks will damage the shells of these reptiles. If the tank is placed near a sunny window, care must be taken to ensure that part of it is in shade to prevent over-heating. During the dull, winter months terrapians will benefit from artificial light from overhead bulbs, though this is probably not essential.

Terrapians must be fed correctly. When very small they should be offered finely scraped raw meat, chopped earthworms and occasionally raw fish. Some terrapians also like to nibble on lettuce leaves and pondweed (*Elodea*, etc.) from time to time. Fatty or cooked meat must be avoided. It is a good idea, and particularly important during the winter months, to add calcium and vitamin D to the diet of these reptiles. A diet low in these nutrients, along with our cloudy

climate, can easily produce soft shells in terrapians. Simply roll the food in powdered cuttle-bone and/or fish liver oil about once a week. The terrapians should be fed three or four times a week, trying to avoid overfeeding. As they grow older they may be offered larger pieces of raw meat and fish, whole earthworms, etc. Tetra tablet foods are an excellent, convenient diet for terrapians.

Terrapians are very messy feeders and hence the tank will need cleaning at least once a week. Remove the terrapin to a bowl of water at the correct temperature, and switch off all electrical appliances connected to the tank. Clean the tank out well and fill up to the desired level with water at the correct temperature. Switch on the heater-thermostat and then replace the terrapin. Without regular cleaning these reptiles may develop a number of disorders, including eye troubles. As a precaution, it is wise to wash your hands after dealing with these animals.

daphnia . . .

I would like your advice on breeding a culture of daphnia. I have a plastic tub and I put some horse manure in it but it floated to the surface and the water became foul. What do you suggest?

The plastic tub is unsuitable as the water surface area is too small to allow sufficient oxygen to enter. *Daphnia* require well oxygenated water and so you should use a small pond or a container with a wider surface area. Then take some water from your pond,

the greener the better. Then add some crushed or boiled lettuce leaves. After a few days examine the water with a microscope to see if there are plenty of *infusoria* in it. If so you can add some *daphnia*. Do not take any for feeding until they have multiplied. Make frequent changes of the water so that it does not become foul. As you state that you need a constant supply to feed 17 fair sized fishes, I suggest that you supplement the *daphnia* with garden worms and maggots besides the usual dried foods; remember that *daphnia* are only a small feed for adult fishes but very good for rearing fry. I am enclosing an address from where you should be able to get some good fancy goldfish as you request.

C.A.

TROPICAL



Dr. C. Andrews

COLDWATER



Arthur Boarder

Coldwater

foreign matter . . .

I inherited a garden pond with my house and fishes and plants were doing well. I made the mistake of putting some pond blocks in the pond with the result that I lost all fishes and plants. I want to start again and wonder what soil I should put on the bottom?

I do not know what you mean by 'pond blocks' and can only think they are a kind of fertiliser or small pieces of rock. Whatever you used it seems very lethal and might have contained lime. You will not need any soil, etc., on the bottom of the pond but set all plants in separate containers. This will make it easy for cleaning out the

PLANTS



Vivian De Thabrew

KOI



Hilda Allen

MARINE



Richard Sankey

DISCUS



Eberhard Schulze

Our experts are always pleased to receive your letters which should be addressed to Readers Service, The Aquarist & Pondkeeper, The Butts, Brantford, Middlesex TW9 8BN. All queries must be accompanied by a S.A.E.

pond each late autumn. Most water plants do not need a rich compost and J.I. potting compost No. 1 is sufficient. Water lilies can have some decayed turf to start them off. Water plants should send their roots through the crevices in the containers so that they can use up much of the waste matter from the fishes. A fountain or waterfall will not be essential. A fountain adds to the attraction of the pond but as it only moves the water about it cannot remove any impurities from it. If a waterfall is made with a filter at the top, this will be an advantage. You must realise that a waterfall for a small pond is not very satisfactory as once the fall is switched on, the level of the water in the pond will drop considerably.

sticklebacks . . .



Please can you tell me where I can get some Three-spined Sticklebacks. I need them for animal behaviour studies?

Three-spined Sticklebacks, (*Gasterosteus aculeatus*) are common in most streams, ponds and canals. You could catch them yourself or get a boy to do this for you. They are not usually stocked by dealers but if you cannot obtain them as suggested I will include

the address of a firm who should be able to get some for you. You must be careful with your sexes as males can become very aggressive, especially in the breeding season. If kept in a tank it is better to have only one male to a few females to avoid trouble.

filter . . .

I have made a filter for my pond with an oak box but the water coming through the holes in the bottom is brown. Will this be poisonous to fishes?

If not actually poisonous the brown stain could harm the gills of the fishes. Water continually running through the box could build up to adversely affect the gills of the fishes. Your pond is not very large and so need not have a filter at all, unless you over stock with fishes or over feed.

A.B.

Plants

barren waters . . .

Recently I have joined the committee of a local angling society and have taken a particular interest in one of our problem waters. The club has had an ecological survey done by North West Water, and the main finding was a lack of plant life, which is the direct cause for a large number of invertebrates being completely absent from the water. Could you please advise me as to the most suitable species of plant life that we could introduce to the water. It is classed as mesotrophic with a pH varying between 7.5-7.9. Chemical analysis

showed the following results: pH 7.9, Ammonia .05 mg/l, Nitrite .01 mg/l, Nitrate .10 mg/l, Solo-phosphate .05 mg/l, C.O.D. 27 mg/l, B.O.D. (suppressed) 1.00 mg/l, suspended solids (total) 10.00 mg/l, suspended solids (ash) 3.00 mg/l, Chloride 20 mg/l, conductivity 280-310 us at 20 C, alkalinity to m.a. 85 mg/l. These readings were obtained shortly after an algal 'bloom'.

The main problem is the fluctuation in water level; the reservoir is used as a feeder for the canal; when full in winter the depth is 40 ft., but in summer the level drops to approx. 12 ft. The sides have a very steep gradient of 1 in 2 approx. The only 2 species of fully submerged plants found during the survey were *Potamogeton crispus* and an *Elodea* species, and these were very sparse. Could you please suggest any species of plant which we could introduce to the water which would survive the dramatic fluctuation in water level.

The main problem concerning plant growth is the extreme depth of your reservoir. Very few plants grow at depths of around 40 feet. However, if this level drops down to 12 feet during the summer, there are a few species which will establish, although the alkalinity of the water is another problem. The species are: *Myriophyllum spicatum*, *M. verticillatum*, *M. heterophyllum*, *M. alterniflorum* (all Water Milfoils), *Littorella uniflora* (Shoreweed), *Ceratophyllum demersum* and submersum (Hornworts), *Callitriche* species (Water Starworts) and some *Ranunculus* species. These species will also adapt to submerse growth when the water level is reduced. They

will also tolerate the alkalinity of the water. **V.T.**

Koi

koi addition . . .

I had intended to add a few Koi to my collection of goldfish etc, but having read recently that Koi are aggressive and quickly outgrow their surroundings I am now having doubts about the wisdom of this. Your views would be appreciated.

Koi are certainly not aggressive to other fish and many Koi-keepers will confirm this. In the early days, most of us began by introducing a few Koi to established ponds containing a mixed bag of fish. We may have learned a few hard lessons about the careless introduction of disease and/or parasites and the change in water quality once Koi have been added. We never found Koi to be aggressive and indeed there are many ponds today which contain a variety of cold-water fish. Catfish should be avoided, they are aggressive and carnivorous especially towards small fish.

Koi cannot "outgrow" their environment. They will grow according to the space available and then stop, they may get over-fat through lack of exercise but generally the size is determined by the size of the pond—or tank.

It is foolish to buy large Koi (anything from 12 to 24 inches long) to put into small ponds. Fish of that size were not raised in a confined space and it is unfair to expect them to thrive under limited conditions. Apart from my usual warning noises about isolating new purchases I wish you well. You are almost certain to become "hooked" on these delightful fish once you have a few healthy specimens enjoying themselves in your pond. I know I was, in 1969; I am still fascinated. **H.A.**

Marine

tomato clown . . .

I am writing, as a rather dis-

traught novice in want of urgent assistance in diagnosing what ails my once beautiful Tomato Clown. On the 13th June, my fish became listless, ceased feeding and hid in a trench dug by itself at the rear of the tank. Fearing an attack of oodinium or possibly white spot, I began a course of Cuprazin for 10 days. His appetite was tempted by frozen brine shrimp and the hiding stopped. However, the appearance of isolated white spots easily visible around the face and eyes have continued. The white band around the head is quite badly affected, the appearance being that of wounds or pitted holes, dark in colour, such as in scouring.

I was advised to treat with myxazin, this I have been doing for the last five days with no reduction in the progress of the disease. The line marking out the eye sockets have become affected by a line of regimented white spots, and also along the lateral line of the left flank. Nothing in my limited library of books suggests that the white spot and fungal diseases follows such an orderly fashion. It is this and the apparent ineffectiveness of my treatment which makes me feel that I am totally on the wrong track.

As I only have the one marine tank, I have been unable to quarantine this fish, yet the other occupants are perfectly well and show no signs of succumbing to the same disease. They are: 1 humbug; 1 yellow-tailed damsel fish; 1 cleaner wrasse; 1 common clown; 1 yellow Goby.

The Goby does, however, have a small area of fin rot on the anterior dorsal fin which is improving with the myxazin treatment.

The Tomato Clown is now eating well, and shows no signs of irritation, despite progression of the disease, and the spots are quite separate and can be counted as being by no means in any profusion. I would also be grateful for a comprehensive book on fish ailments, if you could suggest one if possible their appearance under a

microscope, as I have the equipment.

In answer to your recent letter to the Problems Page of the *Aquarist & Pondkeeper*. First, let me say you were definitely on the wrong track in diagnosing white spot or oodinium. Both these particular diseases are protozoan and would have very rapidly spread to your other fishes. Furthermore, they are not isolated to attack specific areas on the body of any one given fish. By the way that the infection has spread on specific areas, i.e. on the lateral line, I am convinced that your fish is suffering from a predominately bacterial infection or perhaps which I consider to be the least likely, a fungal infection.

Usually these infections are stress induced, so my first piece of advice would be to carefully look at your system and see if you can improve upon the environment of your fishes in some way. Secondly, make sure that you are keeping up with small, but very regular water changes. In my opinion up to 5 per cent per 1-2 weeks. Sadly enough these localised bacterial infections will tend to move down the body of a fish in the way you have described, in what amounts to be a very small original source of infection. I am sure the fish could be cured very simply in a separate marine quarantine aquarium with biostatic solution. However, this option is not open to you so I would suggest the following:

Purchase from your local chemist shop 100 ml. of 36% (approx.) Formaldehyde, plus also a 5 ml. disposable hypodermic syringe—graduated. Then prepare a bath solution made up as follows. Take a plastic container of about 1 gallon, add to it 1 gallon sea water from your aquarium, and using your graduated syringe, gradually measure off 2 ml. of the Formaldehyde solution. Mix it in well with the sea water and then place your Tomato Clown in this bath for 15-20 minutes.

The fish may show signs of distress, particularly in the first 1-2 minutes, but be assured no harm will come to the fish. After 15 minutes, return the fish to your aquarium and dispose of the bath solution. Do not, repeat, do not add it back to your aquarium. I would repeat the bath process again 48 hours

later and again 3 or 4 days after that. The bath should not be used more than 3 times in 10 days.

Formaldehyde is a very strong poison and great care should be taken in handling it. This same bath solution will irradiate approximately 99% of all aquarium parasites as long as they are not water borne parasites and there should be no reinfection. I sincerely hope that this relatively simple, but extremely effective method will be of some use to you.

R.S.

Discus

discus problem . . .

I have been keeping Discus for more than eight months now; I bought six when they were babies. Four of them grew very fast but the other two basically stayed the same size and eventually died. I then replaced the two with some of the same size as the remaining four and within a few weeks this tank has given me a lot of trouble. Since I introduced the two new Discus they have all become very shy and hardly seem to want to come out of their back corner. They also eat much less than they did before and now some of them go dark for a little while. I have also found long white faeces trailing from the fish and have treated the fish with heat. Heat seems to cure this ailment but it always comes back and I fear that I am going to lose three of my Discus. I would be very grateful for any information you could give me to save the three fish which seem not affected at present.

Spiroucleus, a flagellate living in the gut of your Discus fish, is responsible for the long, white faeces. This disease is also common in many other cichlids from South America as well as Africa.

In Germany it has always been said that Spiroucleus is a 'neglect disease,' either because the fish are kept in an

unsuitable water, the bacteriological filtering bed has been exhausted or the minimum of maintenance is just not carried out. I also found that the infection can suddenly break out when fish are moved and there is a great change in their environmental conditions. Frozen foods must be thawed out before they are given to the fish, especially to young Discus. The symptoms in young Discus are different from those in other Discus. Their fins look as though they have been eaten away and often the fish are treated with an anti fungi medication: but, of course, no improvement will happen—since it was the wrong diagnosis—and after a while the fish will get very thin over the eyes and die.

With adult fish, the symptoms should also not be ignored otherwise it will not take very long before the fish will be beyond recovery even though the fish seem to be able to cope with this disease better than younger specimen.

To cure Spiroucleus in Discus it is necessary to have a very reliable thermometer since most of the available aquarium thermometers are just not accurate enough and the additional expense for a photographic type of thermometer will certainly not be wasted. The temperature of the water must be raised to 95 to 96 degrees Fahrenheit and kept there for at least seven days. At this temperature the oxygen content of the water will be very low and an additional airstone should be used. Discus do require an almost 100% oxygen saturation of the water and the addition of one of the new Oxydators will certainly help. It will be noticed within a few days that the Discus will perk-up and their colour will also return. After two or three days a small amount of food should be given and hopefully the Discus will show again some interest in the food. It is also a good idea to use a vitamin supplement in the water to maintain their health and cure and either HilenaVit or LiquiFit added to the food or introduced direct to the water should speed up their recovery. If the vitamins are given direct to the water the lights must be switched off since all vitamins are destroyed by light.

All white faeces should be removed from the tank and it is also a good idea to change the filter media in a power filter and wash the gravel bed to make sure that the fish are not re-infected. As you have been able to cure the disease but since it seems to come back I can only assume that you did not reach the desired temperature of the water or the Discus were re-infected because of organisms surviving either in the power filter or gravel bed. Spiroucleus is still quite common today but it can be cured with ease and no fish should die because of it.

Many Discus keepers do, as a matter of course, give their Discus a treatment of HEXA-EX or FLAGYL every six months or so and if given at the same time as the heat-treatment then one can be sure to have completely eliminated this disease. Some of the German Discus breeders I know raise the temperature of the water in their growing-on tanks to 90 degrees Fahrenheit every six or eight weeks, to prevent this sort of trouble in their overstocked tanks.

Give your remaining Discus special treatment: make sure that their water is as near perfect as you can make it; once the faeces are no longer white in any fish you can lower the temperature to 86°F; do small but regular water changes and never give frozen foods to your fish and I am sure that you will find that your Discus will make it.

Spiroucleus may have killed a lot of Discus in the past but today any competent Discus keeper should be able to deal with this kind of disease.

E.S.

APOLOGY

We regret the typographical error which resulted in *Botia macracantha* being misnamed *Botia macracarrilla* on the title page of the article on The Clown Loach which appeared in our October issue.

Press Release



Red Liquifry!

Breeding of tropical aquarium fishes is obviously an important hobby in Russia, according to Dr. Neville Carrington of Interpet Limited. His company makes Liquifry, a food used for feeding baby tropical fish and for various research purposes.

Liquifry consists of minute food particles in a liquid suspension which is dropped into the aquarium to feed the baby fish. The product has been made since 1952 and is now sold to 80 countries. Small quantities have previously been sold to Russia but a recent order for over 36,000 tubes would be quite respectable even by American standards—and suggests that fishkeeping is a booming hobby in Russia.

For further details contact: Mrs. D. Parkins, Interpet Limited, Interpet House, Curtis Road, Dorking, Surrey RH4 1DP.
Tel. (0396) 883202. Telex 859115 CARIN G.

New products from UNO

New features as far as Uno Products developments are concerned is that they now have available a range of toughened GLASS Heaters, Thermostats, and Heater/Stats of superb quality.

The glass has been specially toughened and designed to meet the stringent BSI Impact Test No. 3456, and will be a welcome relief to all enthusiasts who preferred Glass prior to the introduction of the Safety (Electrical Equipment) regulations in 1975.

The new products have been given new names, the Heater/Stat being called the "Reliant", the separate Heater—"Regal Toughened Glass Heater" and the thermostat the "Accurist."

All are packed in attractive newly designed cartons, and provide the usual 1 year 'no quibble' guarantee. The retail prices are £7.10, £3.94, and £5.93, respectively.

Uno are continuing to market the

"Supreme" Polycarbonate Heater/Stat and the Nylon coated Aluminium Heaters, which give the added protection of an earthed system. They have also re-designed the adjustment knob on the Supreme in line with the Reliant which gives a solid easy turn system in preference to the old flexible rubber adjustment which after a while was liable to perish.

Regional sales over the last 6 months would appear to indicate that Uno have got it right.

This all being due to a massive extensive and expensive investment programme.

Revolutionary New Oxydator

It is not often that a new product appears on the UK market only a few months after its first showing at the Wiesbaden Exhibition. Great efforts are being made to bring the fishkeeping hobby into the micro-chip era. New generations of power filters seem to appear more frequently than in the past, drip-feed filters are slowly becoming an established way of making the relative small world of an aquarium a more perfect environment for the fish, but the sensation at this year's Wiesbaden Exhibition was a revolutionary innovation. The Oxydator.

This unit will supply the aquarium water and the gravel bed with ordinary and activated oxygen and not just with atmospheric oxygen as supplied by an airpump with its possible danger of pollution with fumes and gasses, etc. But the Oxydator will stabilise the aquarium water to an ideal Redox potential for the fish and plants. In fact, the Oxydator will not only replace noisy airpumps but also biological filters, CO₂ diffusers and even ozonisers. It requires the minimum of attention, it needs no electricity to operate, no airline—even under unbroken ice in a pond during

the winter. It undergoes no wear and tear so operation is virtually unlimited.

Tests in Germany and Holland have shown that fish showed better colours, were more active and resistant to diseases; baby Discus fish had grown twice as fast, Black Lyre Mollies were kept free from fungus and aquarium plants showed a luxuriant growth which was constantly repeated.

The Oxydator was developed in Germany by Dr. Rer. Nat. Klaus Sochting and is imported into the UK by the Highgate Aquarist. It costs £27.75 inc. VAT (the same price as a quality airpump but without the noise). It is available from all good aquarium shops but in case of difficulties or for further information, direct from the Highgate Aquarist, 367a Archway Road, London N6 4EJ.

The Simlawood Revolution

UP TO six years ago aquarium decoration was very much a do-it-yourself thing. Aquarists scrounged around for suitable pieces of rock or driftwood. Although the results they achieved were remarkable considering how little they had to work with; the effort involved must have deterred all but the most dedicated aquascapers.

SIMLAWOOD was conceived when I was examining a range of simulated wood/bark bulb bowls in Woolworths. The realistic and attractive finish excited me so much that I quickly saw the potential for the manufacturing principle to be used to create models for underwater use.

I contacted the manufacturer Mr. David Batsford of Batsford Products and put the idea to him that a range of log and branch sections could be a successful innovation on the aquarium market. The next day found David and I at "Everglades" chopping branches off of suitable trees and scouring the ground for semi-decayed specimens suitable for moulding.

Within a few weeks we felt we had a suitable range together and showed the product at Belle Vue for the first time. It proved an instant success and

we were well pleased with the orders we obtained both there and at Harrogate.

Further developments included rock-work both formal and informal with such esoteric creations as ruined castles, bridges and sunken galleons which already were being successfully sold in a concrete finish.

David who has a vast experience in the plastics industry next turned his attention to the possibility of creating larger models in Fibreglass; as Polyester, from which Simlawood is made is rather too brittle for thin section work. And so rockscapes were created which now grace many an aquarium. This series is still being developed with models for both outside and inside the tank, under test at the moment.

Many Simlawood pieces have a definite function. Models 200 and 300 and 130 are all hollow backed, allowing for the incorporation and subsequent disguise of heater/thermostats, filters and airline attachments such as airstones.

With the advent of Under-Gravel filters, aquarists have found it almost impossible to grow plants satisfactorily. Some inhibiting factor is at work which prevents the plants absorbing the nutrients they need. I therefore designed a new filter which we call "Aquascape Rockies" which whilst embodying the U/G filter principle, protect plants from damage to their roots and also act as decorative rock-work items in their own right. These are patented and are also manufactured by David in fibreglass and finished in the same way as rock scenes.

Simlawood is now exported all over the world and David expects this side of the business to increase rapidly now the word is out. Meanwhile the home market can expect a constant flow of new and exciting products from the workshops of David Batsford.

The theme of function related to design will continue. Every model will be dual-purpose. Strata rock for terracing is well on the way to being ready for the market. Other wood and rock pieces are being developed to hide box filters, sponge filters and submersible power filters. Although Simlawood has always had

a natural bark finish, plans are afoot to make simulated bogwood which whilst looking like natural bogwood will be standardised for ease of use and will of course have the advantage of negative buoyancy and will not release any of the humic acids which turn the water brown with the natural product.

BARRY JAMES
(Everglades Aquatic Nurseries)

Important changes within OFI

THE Ornamental Fish International Wholesalers Organisation recently held their Annual General Assembly at Wiesbaden and several new appointments were made.

Mr. Werther Paccagnella from Italy remains president for a further two years and Mr. Keith Barraclough from the United Kingdom takes over the newly created role of chairman. This new position within the OFI is aimed at providing the organisation with a greater degree of day-to-day control, particularly as the head office has been transferred from Italy to the UK. Mr. M. Ruijsbroek of Holland was re-elected as vice-president and Mr. Windelev of Denmark and Mr. S. Janson of Sweden were newly appointed as vice-presidents.

As the result of the resignation of Mrs. Vera Paccagnella as general secretary of the OFI, this position is now held by Mrs. Janet Cruise of the United Kingdom. Mr. Joost de Jongh of the Netherlands is the newly appointed press officer for the organisation.

Mr. Keith Barraclough, chairman, said: "The OFI, with its worldwide interests, is a multi million dollar industry which is set to achieve even greater economic, political and social standing." He added: "Fishkeeping is a hobby enjoyed by millions of people throughout the world, and as importers of aquatic fish, it is our responsibility to ensure that the fish we sell across the five continents are of the highest possible standard."

Continued on page 66



Coldwater Jottings by Frank W. Orme

I RECENTLY read that a vast cloud of volcanic ash, which is drifting through the stratosphere, will slowly pass over northern Europe and other regions in the hemisphere. The result, it was forecast, would effectively lower temperatures and produce frosts at the most unexpected times of the year; possibly the cloud would blanket-out the sun for much of the year. It was anticipated that those areas affected by the cloud would be subjected to a year of cold, sunless days. Prior to this, however, as the cloud approached we would witness some outstanding sunsets.

Even the most magnificent, colourful sunset could not, I feel, compensate for the lack of sunshine during the daytime. What effect, I wonder, would the forecast conditions have upon our coldwater fish; would it have any effect upon their spawning activities? One can imagine that if the water temperatures remain too cold, and there is an absence of bright sunlight, the fish may well refuse to spawn. Additionally, the adverse conditions could result in a severe reduction of those various forms of small livefood upon which the young fishes rely during the early days of their life. *Daphnia*, for instance, may not be as abundant as it is under normal conditions.

The aquarist, of course, may be able to overcome the lack of warmth and light by artificial means and so encourage the fish to spawn, and the young can be raised on alternative non-live foods if necessary. These methods, however, all add to the expense of the breeding programme, for the further one departs from natural methods and foods the more costly it becomes, after all electricity is no mean item!

Coming of winter

If the forecast becomes fact the prospect looks rather 'gloomy' in all respects, therefore I hope that the article which I read was the result of a journalistic imagination. Anyway, these long-range forecasts seldom materialise—I tell myself!

Bearing in mind the atrocious conditions of last winter, the coldwater fishkeeper might well be advised to give some thought to the coming months. Ensuring that any heating equipment is safe and functioning correctly would be a sensible precaution to avoid being caught-out. Faulty heaters are better repaired or replaced in readiness for any sudden freezing conditions which may come our way. Pools can be given some protection, if they are not too large, by constructing

a timber frame to which heavy grade clear polythene, or rigid plastic sheeting, is attached. If placed over the pool, such a screen will normally keep the water surface somewhat warmer than the air temperature; used in conjunction with a pool heater enough protection may be given to prevent the surface water freezing completely. A little thought and work now, may later prove to be time well spent, especially if it helps to avoid losses of fish. This, of course, will only be successful if the pool is in a clean and healthy condition, and the fish are not suffering from any complaint. A foul pool containing ailing fish is not likely to survive the winter, but no caring fishkeeper would allow such conditions to prevail in the pool, even if they arose through some accident of mismanagement.

Goldfish breeders

Earlier in the year I visited a father and son team of professional breeders of fancy goldfish, whose premises are situated in Water Orton, near Birmingham. It is always a great pleasure to chat of this and that with this couple of old friends, as we stroll around the numerous stock pools. Large numbers of fish are produced, in many different varieties, and grown to good size.

The spacious tanks in the fish-houses appeared to be filled with good quality healthy, well-grown young fish from this year's spawnings and, it seemed, nearly all of the most popular varieties were represented. A similar picture was evident outside, where the pools contained very large young adults. There were Bristol shubunkins, scaled and nacreous veiltails, moors, various types of orandas—some of these had really large hoods, fantails, lionheads, celestials, bubble-eyes and other varieties. The adults, I was told, had spent last winter outdoors, which proved their hardiness at least.

The prices which were quoted to me seemed very reasonable; in fact, in some instances, I just could not believe

Coldwater Jottings

that the prices were sufficient to cover the cost of raising the fishes. When this was mentioned to the younger of the two men he explained that the fish were priced as competitively as possible because not many of today's fishkeepers were in a position to pay the true worth of a fancy goldfish. Both men remarked that they were surprised that more dealers did not avail themselves of the opportunity to purchase British-bred fish rather than going to the trouble of importing stock. There was, they said, an inherent risk involved in bringing fish, unseen, from overseas.

Whereas fish could be inspected and selected at their premises, and the buyer would know that no risk was being taken with the purchases and would all reach the dealers' tanks alive and in a strong, healthy condition. However, they both stressed that they had no time for the person, whether a dealer or private individual, who only wanted to pay a few pence for a fish. From their point of view the sale had to be fair to both sides, and their business was not founded with the intention of giving the fish away, for breeding fish was their living and could not be run at a loss. This, I would have thought, is self-evident and yet, I was told, one dealer was sent away empty-handed when he refused to pay anything more than twenty-five pence each for good quality adult fish. I do not know which variety this particular dealer was interested in, nor did the two partners reveal who he was, but

the adult fish which I saw all averaged a body length of around three inches, and the price offered would certainly not have covered the cost of raising the fish to that size.

Increasing costs

The high cost of living, with ever escalating prices, high unemployment, and the uncertain future are all factors that have an effect upon the cost of the aquatic hobby, and the price of fish in particular. As in almost every other sphere, producing fish becomes ever more expensive, a fact which has to be reflected in some degree in the prices charged. In many cases the question must then be asked, which is more important—the acquisition of a fish or the purchase of essentials? Quite often it is the latter consideration which must be given preference. And yet, despite these difficult times, our hobby continues to flourish!

BOOK REVIEW

Continued from page 51

The same can hardly be said about a rose garden or a shrub.

Many garden lovers may dispute the author's statement; but for all that there is no question that a patio incorporating a pond is an attraction no other garden adornment can equal when the vagaries of the English climate allow us to take advantage of it.

"By a garden is meant mystically a place of spiritual repose, stillness, peace, refreshment, delight." This lovely phrase, written by Cardinal Newman many, many years ago, serves to emphasise Mr. Gordon

Ledbetter's enthusiasm for his subject. "In a sense," says Mr Ledbetter, "the apparently unchanging materials of a well designed patio garden are never quite the same two days running. But in any case, no one is likely to want to build a patio without also growing plants in and around it. It is the plants which provide the whole area with its soul..."

Several ways of making a pond are gone into in chapter two. The easily followed instructions are supplemented by first class black and white photographs of fibre glass ponds (ready for setting into the excavation), different sorts of liners and their correct positioning and, lastly, the building of ponds with sand, aggregate and cement. Chapters three and four deal with the raised pond, ornamental fountains, waterfalls and cascades. All are treated with considerable detail. Laying the patio enables the reader with not too much experience in this type of work to achieve the best results employing natural stone or fabricated slabs, bricks and tiles, or concrete laid direct onto a levelled and tamped down soil.

Before settling down to deal with oxygenating plants and water lilies (in chapter seven), Mr. Ledbetter gives a plethora of advice and information on other patio features such as low walls, pierced screens, trellises and fences, gates, steps, raised beds and troughs. Space is also allotted to the making of a barbecue, integrated into a wall or free standing. Marginal plants, ideal plants, shrubs and dwarf trees to grow in tubs, the most hardy and showy fishes, and a host of other things pertaining to pond life (including the natural enemies of fish), as well as sound design, are adequately covered in succeeding chapters. The book is rounded off with an interesting and highly readable diary of a pond in progress. The diary describes the author's personal observations of his patio pond over a twelve-month period. Reading this book, we are continually made aware of the immense fund of knowledge the author has amassed over the years. There is no question that Mr. Ledbetter's book can be thoroughly recommended.

JACK HAMS.



THE Wildlife and Countryside Act, due to come into full effect this autumn, has wide implications for the aquarist; but without a copy of this 128-page Act (HMSO, £7.05), few people will have access to its lists of protected, sale-prohibited and other listed plants and animals, which include several fish, reptiles and amphibians. Fewer still could identify half of them, be they police or members of the average natural history club.

It protects all three British newts, both our lizards, all three snakes, plus slow-worms, both toads, the common frog and the burbot of slow rivers from Durham to Suffolk. Fully protected plants include triangular clubmoss confined to southern counties; some 500 surviving water-germanders from Devon's Braunton Burrows to Cambridge and Suffolk ponds; fen-orchid and fen-violet; ribbon-leaved water-plantain from Doncaster's Thorne Moor to Cambridge and Norfolk; and greater yellow rattle now probably extinct at its Anglesey haunt, Llyn Coron. But not yellow sedge, the rarest plant I saw at Roundsea Wood reserve where it is increasing on the southern fringe of Lakeland, a plant of dubious purity at Malham Tarn and in Ireland's Lough Corrib.

The Act restricts the sale of such endangered fish as shortnosed sturgeon, Asiatic bonytongue, longjaw cisco, the cui-ui, Ikan temolek, giant catfish, blue walleye and dum fish; as well as 17 crocodiles, caimans, gavials and the Chinese alligator; 3 iguanas, 4

by Eric Hardy

monitors, 7 snakes; 18 turtles, terrapins and tortoises including all sea-turtles; giant Chinese and Japanese salamanders, golden frog and golden Cameroon and viviparous toads. It's an offence to introduce foreign species to the wild, excepting those already established, namely large mouthed black bass, rock-bass, European catfish, zander, bitterling, alpine newt, edible, marsh and European tree-frog; African clawed, midwife and yellow-bellied toads, and European pond-terrapin. It's an offence to uproot, sell, advertise or even pick any of the fully-protected wild plants, and only authorised people can do this with any other wild plant. Scientific exceptions, as usual! The common frog is protected only against sale or advertising for sale; but the Act is very complicated and often confusing. Solicitors may benefit as much as our wild life!

Limpets

We are apt to think of limpets only as seaside shellfish, but a modern colonist of British waterlife is the freshwater limpet, *Ferrisia wautieri*, first found here in 1976. It has now been discovered in Yorkshire's Calder and Hebble canal at Ganny Lock near Brighouse. It is also at Cowden-Burcombe Cross in Sussex, the River Ouse at Great Barford in Bedfordshire, ponds at Parkhurst, Isle of Wight and in Huntingdonshire, at Bishops Waltham (Hants.) and in Norfolk.

The first issue of *Coral Reefs*, the new journal of the International Society for Reef Studies (£11.91 a copy), has a London University paper whose researches concludes that "the uranium concentration of coral skeletons is related to the concentration of this element in the seawater" (who'd have thought that!); that calcium doesn't affect it and only sponges there seem to increase the uranium concentration. 2,500 individual coral reefs form Australia's 2,000 km. Great Barrier and the Institute of Marine Science at Townsville has made a study of their varying fish-communities, noting 146 species, including 44 Pomacentrids and 36 Chaetodontids, groups commonly kept in marine aquaria, but considerably more restricted than others in distribution. Fewer species inhabit inshore than other reefs. Differences in their communities are often due to wave differences, especially around the outer-shelf reefs, which again

isn't surprising, as well as sediment, water-depth and topography.

Coral-study methods range from scanning electron microscopy in skeleton structure to radioisotopes for measuring calcification rate, which can vary as much as 50% in the effect of light. From microprocessor underwater data systems to inexpensive aerial photography of reefs from flying a kite at 50 to 200 m whose chief problem is precise matching, in winds of 7 to 25 knots, using an automatic camera with autowind, with a polaroid filter to cut down water-reflection.

British corals are only a meagre

representation of these animals. Our rocky shores are rather better supplied with most attractive sea-slugs but nothing like the colourful range of Mediterranean species. The first monograph on Mediterranean nudibranchs and saccoglossas for about a century, the 40th monograph on the fauna and flora of the Gulf of Naples, is Schmekel and Portmann's new *Opisthobranchia des Mittelmeeres* from the German scientific publishers Springer-Verlag at £98.4. With 18 excellent colour-plates, it covers 107 Nudibranchs, the true sea-slugs and 20 of the related Saccoglossas and

their development, each German description with an English summary—all in some 400 pages.

Incidentally, the new Wildlife Acts includes provision for the Nature Conservancy to form a marine nature reserve where tidal waters have special faunistic or floral interests, creating facilities for their study and byelaws prohibiting or restricting entry, collecting or disturbing its animals. The Act covers British territorial waters where it is an offence to introduce giant kelp and Japanese seaweed for instance.



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

New fish food from Tetra

TETRAPOND DOROFIN STAPLE FOOD is manufactured in West Germany by TetraWerke and is supplied in 100 gram/3.53 ounce drums at a recommended retail price of £1.95. This fish food is distributed by Warner-Lambert Pet Care, Mitchell House, Southampton Road, Eastleigh, Hampshire SO5 5RY; telephone Eastleigh (0703) 619791.

This new food is for goldfish, koi and all other pond fish. The food comes in the form of little sticks—about 1/4-1 in. in length and pink or buff in colour—which are made by extruding an appropriate food mixture.

The ingredients are: corn meal, oat flour, 'soybean meal debulled solvent extracted' (sic), poultry by-product meal, wheat flour, corn flour, yeast, algae meal; minerals Ca, P and Mg; trace elements Mn, Zn, Fe, Cu and

Co; and vitamins A, D3, E, C, B1, pantothenic acid Ca, nicotinic acid and K3. The guaranteed analysis is: min. crude protein 20%; min. crude fat 2%; and max. crude fibre 8%.

A press release states that the food contains a high proportion "of vegetable matter, a significant factor in pond fish's



natural diets, with a correct concentration of essential proteins. The protein is in a highly-concentrated form which is far more digestible than that normally found in pelleted foods. The high level of digestibility—about 90%—means there is less waste and consequently less pond or tank pollution."

When dropped into the water the food sticks float on the surface of the water and become soft and slippery. They are intended to resemble earthworms.

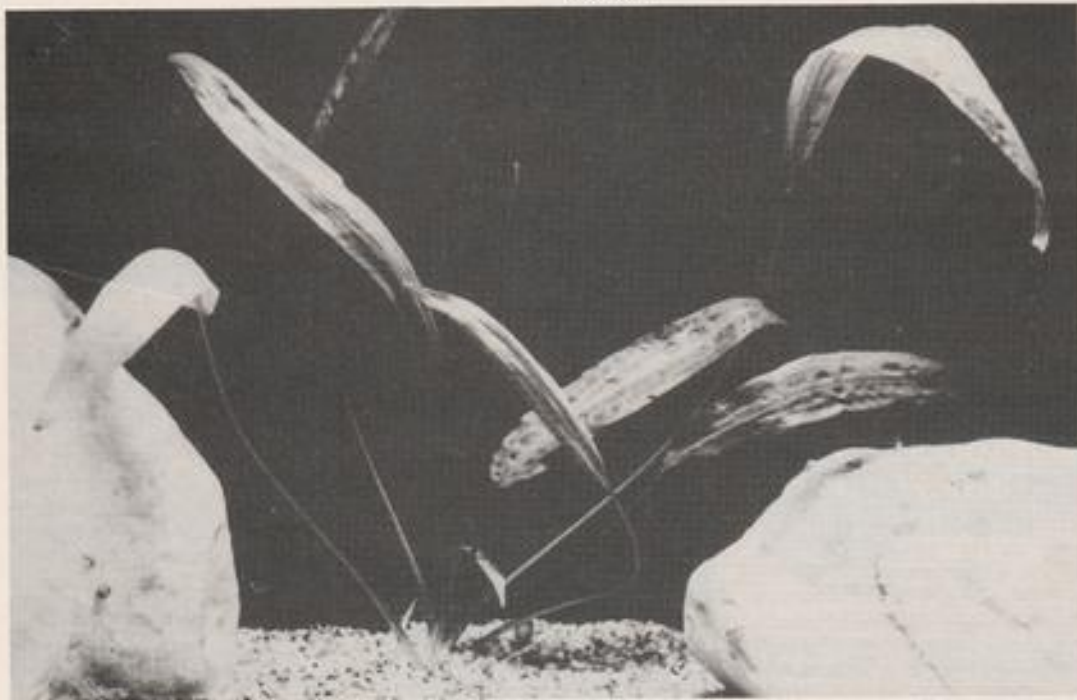
"The sticks emit a smell which attracts the larger fish to bite into them, thereby breaking off smaller pieces which slowly sink through the water to be eaten by all types and sizes of coldwater fish. This feeding process precludes the fish gobbling the sticks dry and thus aids digestion." The press release also states that an estimated 6% of homes in the U.K. have coldwater fish in a pond or tank.

I tried TetraPond Dorofin as a food for coldwater fish in a pond. The food sticks were popular with the fish. I also tried the sticks with large gourmies in a tropical aquarium so that I could better observe the reaction of the fish. The Dorofin food sticks were extremely popular: they provided fun and nourishment even though they are not intended for tropical fish.

I can recommend this food—and the sensible drum in which it is sold. The photograph gives a good impression of both food sticks and drum. TetraPond Dorofin matches the high standards one expects from the TetraWerke stable.

PLANT PROFILE

ARACEAE is the plant family to which belong wild plants such as *Arum maculatum*, the cuckoo-pint or lords and ladies as it is commonly known, and cultivated plants such as the arum lily. Also included in the family *Araceae* is the genus *Cryptocoryne*, a genus that provides a wide range of delightful plants for the tropical aquarium—even though the large number of species of plants in the genus and the variations found in leaf form cause some confusion about the names of various species; and not infrequently botanists revise names as their knowledge of the genus increases.



Cryptocoryne affinis—single plant

Cryptocoryne affinis

by B. Whiteside

One of my favourite aquarium plants—in this genus or any other—is *Cryptocoryne affinis*, a species that used to be incorrectly named *Cryptocoryne haerteliana*, according to Rataj and Horeman; and *C. haerteliana*, according to Stodola, in *Encyclopedia of Water Plants*, and to Hervey and Hems in *A Guide to Freshwater Aquarium Fishes*. (This example of two different spellings of the *incorrect* name might suggest something about occasional confusion over the correct name for particular plants.)

I should say that *C. affinis* is probably the most popular and most commonly seen species of *Cryptocoryne* in the average aquarist's aquarium or dealer's shop—possibly because it isn't too difficult to grow and, hence, it is quite inexpensive. Prices in the July issue of *The Aquarist* ranged from 23p in one advertisement to 30p in another.

The leaves of *C. affinis* have a bright green, shiny, upper surface; while the lower surface, if the plant receives



Tank planted only with *Cryptocoryne affinis* plants

an appropriate amount of light, is a delightful purple colour. As can be seen in the first photograph, the lamina (blade) of the leaf is about the same length as the petiole (stalk). Leaves (whole) are usually between 6 in. to 12 in. in length, and plants can carry a good many leaves at once. Older leaves may get coated in a dark growth of an alga. If this happens the older leaves may be cut off.

C. affinis is not too fussy about water conditions although it seems to prefer slightly acidic, e.g. pH 6.6-pH 6.8, water that is not too hard. A temperature of about 78°F seems to suit it well. This plant does not require a great deal of light and can grow well in quite shaded conditions, e.g. under floating plants, or in tanks that do not receive an excessive amount of natural or artificial light. *C. affinis* grows perfectly well under tungsten light and mature plants reproduce by root runners. A layer of peat under the gravel seems to encourage growth—but the peat layer is not at all essential to the cultivation of this plant. It thrives best if left undisturbed and under suitable conditions several plants can produce attractive thickets of plants in about 10-12 months. I find that the plant grows perfectly well in calcium-carbonate-free gravel that has collected a good layer of fish droppings in it over the months.

Sometimes *C. affinis*—and other *Cryptocoryne* species—may begin to lose leaves when a form of apparent decay sets in. Some writers have suggested a disease as the cause; others anything from too bright light to too many calcium ions in the water. Leaf loss most often occurs if new *Cryptocoryne* plants are introduced to a tank that already contains growing species, or if a plant growing with other plants is damaged in some way, e.g. broken or torn when one is attempting to thin out an excessive number of specimens in one tank. I suspect that in either case—new plants or damaged plants—injured cells of the plants

affected release some chemical substance that causes other members of the genus to lose their leaves. All plants then start off on an equal footing with no leaves. Perhaps the phenomenon has something to do with a trigger mechanism that operates when plants growing emerse suddenly find themselves submerge, e.g. after very heavy rain following a dry spell; or when submerge plants find themselves growing emerse, e.g. when water levels fall.

There seems to be little that can be done to 'cure' or stop the condition once it begins; some suggest a partial change of water. My own advice would be to leave the leafless root-stocks alone as they will grow new leaves more quickly if left undisturbed. Perhaps I should leave this aspect of the plant because although it is an interesting phenomenon I may give the impression that *C. affinis* is a difficult plant to grow in an aquarium.

Such is not the case. *C. affinis* is a relatively hardy and inexpensive plant that needs little light to grow well and reproduce quite quickly. It is most attractive to look at—especially as the older leaves mature and develop purple undersides.

Photograph 2 shows what can happen in a few months if a couple of plants are given suitable conditions and left undisturbed. The fish in the tank shown are guppies and small tetras and the tank contains only *C. affinis* plants.

This is a beautiful, inexpensive plant that will often grow where other species won't. It seems to be quite tolerant of other species that require similar conditions—especially species of the same genus—but if grown alone in a tank it can provide an attractive setting for a shoal of small fish such as cardinals. *C. affinis* blends well with light coloured rocks and gravel and shows up well against a dull, black background—as the pictures suggest.

Please drop me a line if you try some plants as a result of reading this short article.

COMMENTARY

Continued from page 27

The "fixture" mentality about pool and tank contents, too, must be resisted. Though tank layout is usually more critical to the viewer than the pool, which is subject to seasonal variations, one must bear in mind constantly in planning that some plants will grow quicker than others and that most will at times behave in a way which you will not be able to predict. So be prepared for some specimens to race away and for others to languish, but

try to anticipate these eccentricities by laying out your rockwork, bogwood or coral (the latter in the case of marines) so that even if these things do happen the main impact you are trying to achieve will be retained. At the same time make sure that this allows you proper access to recover dead fish, and that the structures are not so complicated and delicate that the first attempt at local rearrangement will topple the lot.

Perhaps the most fallacious notion of all is that ponds and aquaria must contain fish. Most should, later, rather than sooner, if my experience is anything to go by, but not half enough owners cultivate plants alone, some of

which are uncommonly beautiful if left to their own devices, and which would rival the ordinary run of house plants (and need no watering). Years ago many such were maintained, often containing common but interesting beetles crustaceans and larvae which are harmful or incompatible with fish. There is still room for this today, and it is far less demanding of time and money than much of the effort actually expended on seeking the bizarre or the sensational.

PRESS RELEASE

Continued from page 59

"The OFI is unique, being the only organisation of its type in the world. Our members have come together in a concerted move to achieve the high standards to which I have referred and a great degree of success has already been achieved.

Mr. Barraclough said: "The orna-

mental fish trade operates through a chain of people and organisations, each of which has a considerable wealth of experience and expertise in their particular field. From the catcher of the fish through to the end user, the aquarist. Each link in the chain carries a major responsibility. The collector, breeder, broker, exporters, freight agent, airline, wholesale importer and the retailer have one thing in common, the well being of the fish they handle."

"Let's face it, there have been some indiscriminate people purporting to be members of our industry who have been out to make a quick dollar. We

believe that through the determined implementation of our voluntary code of practice we will stamp out those so called 'cowboys' and face the future with renewed confidence and expectation."

Mr. Barraclough said in conclusion: "We are sorry to lose Mrs. Vera Paccagnella because for so many years she and her husband, the president, were the mainstay of the OFI. She worked extremely hard on our behalf and we are forever grateful."

For further information please contact: Keith Barraclough, tel: 0274 576241; or Bob Rushton, tel: 01-404 5575.

OSCAR



G. Robinson

NEWS...



SOUTH EAST



RESULTS of Hounslow & District A.S. 19th open show held on 11th September. Ag: 1, M. Bird (Tonbridge); 2 and 3, E. Stallwood (Newbury); 4, P. Cairns (Runcyonside); R: 1, A. Peart (Tonbridge); 2, C. Richards (Stubbury); 3, B. Witteridge (Stubbury); 4, A. Dempsey (Haringey). C: 1, C. Richards; 2, R. Stallwood; 3, Mrs. Theobald (S.E.A.S.); 4, S. Norris (Bracknell). Cy: 1, B. Witteridge; 2, A. Peart (Tonbridge); 3, R. Hart (Hounslow); 4, M. Bird; 5, M. Webb (Hounslow); 6, Mrs. and Mrs. Cripps (Newbury); 7, C. Richards; 8, C. Richards; 9, S. Norris; 10, P. Furse (Hounslow); 11, C. Richards; 12, B. Witteridge; 13, Mrs. Theobald; 14, S. Wolfe (Eden). F: 1, Mr. and Mrs. Cripps (Newbury); 2, C. Richards; 3, R. Hart; 4, P. Cairns; 5, C. Richards; 6, R. Hart; 7, B. Witteridge; 8, D. Ford (Bracknell); 9, H. 1, 3 and 4, J. Draper (S.E.A.S.); 2, D. Ford; 10, 1, 2 and 4, A. Peart; 3, Mrs. Theobald; 11, 1, B. Allan (Hounslow); 2, A. Dempsey (Haringey); 12, 1, C. Richards; 3, Mr. and Mrs. Cripps; 4, T. Butler (Runcyonside); 5, A. Peart; 6, 1, Mrs. Theobald; 2, M. Bird; 3, A. Peart; 4, B. Witteridge; N-m: 1, A. Dempsey; 2, T. Wilson (Hounslow); 3, B. Light (E.D.A.S.); 4, A. Cole (Stubbury). No-t: 1, Mr. and Mrs. Cripps; 2, B. Light; 3, P. Cairns; 4, W. Crookford (Petersfield). O: 1, D. Ford; 2, R. Allan; 3, A. Hollingbrook (Hounslow); 4, Mr. and Mrs. Cripps (Hounslow); 5, B. Light (E.D.A.S.); 6, A. Cole (Stubbury); 7 and 8, J. Randall; 9, Mr. and Mrs. Cripps; 10, B. Witteridge; 11, B. Light; 12, A. Constantine (Hounslow); 13, W. Crookford; 14, R. 1, Mr. and Mrs. Cripps; 2, B. Light; 3, A. Constantine; 4, 1, D. Punter (Hounslow); 2 and 3, C. Smith (E.D.A.S.); 4, S. Wolfe; 5, T. L. R. Allan; 6, Mr. and Mrs. Cripps; 7, B. Witteridge; 8, B. Light; 9, U. 1, B. Stallwood (Newbury); 2, D. Ford; 3, W. Crookford; 4, J. Taylor (Haringey); 5, 1 and 2, Mr. Fennell (S.E.A.S.); 6, A. Constantine; 7, D. Hart (Hounslow); 8, W. 1, 2 and 3, J. Taylor; 4, R. Hart; 5-m: 1, Mrs. Theobald; 2 and 3, J. Draper; 4, D. Ridgwell (S.L.A.D.A.S.). No-t: 1, Mr. and Mrs. Cripps; 2, P. Cairns; Specialist: 1, A. Peart; 2, J. Draper; 3, J. Taylor; 4, W. Crookford. Best fish in show, A. Peart. Highest pointed visiting society, Sudbury.

THE Fishkeeping Exhibition staged by the **East Kent Aquatic Study Group** at Littlebourne, near Canterbury, on the weekend of 11th-12th September, proved a great success, with over 600 visitors. On display were 50 aquariums of various sizes, all of which were fully furnished and planted and contained an estimated 600 fishes. Centre of attraction was C. J. Bridgman's model of a lighthouse. This stood over 9 ft. tall and housed 12 specially designed tanks. Each was planted and contained such fish as Glowlights, Beacoms, Neons and other "Flashy" tropicals. A beautiful Aquascope measuring 6 ft. by 2 ft. 6 in. was exhibited by A. Hazelden. Also on display were a variety of Reploids and Amphibians. The exhibition manager, R. Spence, is to be congratulated on organising a first class event. At the September general meeting four of the Society's senior members answered questions

From Aquarists' Societies

on many aspects of the hobby. There were 62 members present. Guest Judge for the evening was K. Beadle. He commented on the high standard of the table show and awarded place cards: Anabantoids: 1, R. Mathews; 2, C. Bridgman; 3, M. Boniface; 4, P. Edwards. Danios: 1, C. Bridgman; 2, S. Edwards; 3, B. Spence; 4, J. Edwards. Finns: 1, V. Bird; 2, A. Hazelden; 3, D. Bridgman; 4, S. Edwards. Moorings are held at Belling Hall, Herse Bay, second Tuesday of each month.

ON 21st September South Park Aquatics (Study) Society reserved a special evening for members' slides. Eric Franklin gave an illustrated talk on pond construction which inspired a lively debate on the merits of Butyl liners, concrete, bottom drains and a host of related subjects. David Dudley judged the novice table show, which reflected the recent influx of new members by having a higher than normal number of fish on the bench and awarded the following cards: 1, David Morgan (Ryckin); 2, Pat Birchrop (Orandas); 3, Steve Green (Ryckin); 4, Pat Oldridge (Ryckin); South Park Aquatics (Study) Society specialises in coldwater fishkeeping and meets at 8 p.m. on the third Tuesday of every month at the Wimbledon Community Centre, St. George's Road, London SW19. New members and visitors always welcome. Full details from: Mrs. Marguerite Dudley, 163 South Park Road, Wimbledon, London SW19 8RX. (Tel: 01-540 5663).

AT the Mid-Sussex A.S. meeting on the 9th September, the talk and slide show about Catfish was given by Len Pinner, a member of the M.S.A.S. The table show was judged by Martin Rooney, who is an F.B.A.S. member. Winners: Catfish: 1, Bill Ferrin; 2 and 3, Alan Harrison; 4, Tracy Wren. Corydoras: 1 and 3, Pete Levine; 2, Tom Pidgeley; 4, Sharen Smith. A.O.V. Siggarett: 1, Tam Pidgeley; 2, Steve Smith; 3, Tracy Wren; 4, Pete Levine.

SOUTH WEST



ONCE again the Bristol A.S. Coldwater Fish Show proved a magnet attracting breeders, exhibitors and a large attendance from the general public. There were 463 entries. The Bristol Shubunkin classes were very well supported, especially the teams of four of this year's babies with 31 entries. The Aquarist Gold Pin was awarded to Terry Hall with a fine entry in the 3 in. class. The fact that there were 58 entries in the Breeders Team Section must be an indication of the growing interest in the coldwater fancy. Congratulations to Brian Rothwell on taking the Best Exhibit with a splendid team of Baby Veiltails and to Bill Ramsden on his successes with his Moors, to Jim Day with Baby Orandas and Veils and also to Vic Capaldi with Metallic Fantails and Lionheads. The Society is grateful for the generous support from all exhibitors from afar. Special mention must go to Messrs. A. King and T. McLean from Scotland, to a coachload from N.G.P.S. at

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.

Bolton as well as to others from the Home Counties, the Midlands and Devon. Judges were Messrs. J. H. Bundell, V. Cole, L. Dodge, R. King, W. Leach, S. Lloyd, D. Paul, W. Ramsden, B. Rothwell, C. Spence and H. C. B. Thomas.

Results; Best Exhibit: B. Rothwell. **Points Award:** V. Capaldi and J. Day (tie). **Best Shubunkin** exhibited by a member: T. Hall. **Singletails:** T. Hall, also **Aquarist Gold Pin**. **Twintails:** B. Rothwell. **Matched Pairs**, sex optional: G. Bell. **Goldfish bred 1982:** V. Cole. **Teams of 4 fish bred 1982:** B. Rothwell. **Koi, Pond and River Fish:** Mr. and Mrs. Pilling. **Singletails-Common Goldfish (Red):** 1, M. Calway; 2, J. Midson; 3, W. Hain; 4, J. Rousale. **London Shubunkins:** 1, J. Pollard; 2, J. Midson; 3 and 4, Miss Andrews. **Comets:** 1 and 3, P. Norman; 2 and 4, H. Thomas. **Bristol Shubunkins 3 in.:** 1 and 4, T. Hall; 2, V. Cole; 3, R. King. **Bristol Shubunkins 5 in.:** 1 and 2, P. Davies; 3 and 4, J. Amos. **A.V. Singletail Goldfish Yellow or Variegated:** 1 and 2, H. Thomas; 3 and 4, D. Garland. **Novice Bristol Shubunkins:** 1 and 3, J. Rousale; 2, T. Barnes; 4, W. Ramsden. **Novice A.O.V. Singletail Goldfish Metallic or Calico:** 1, J. Garland; 2 and 3, N. Jordan; 4, P. Garland. **Twintails-Fantails Metallic:** 1, 2 and 3, V. Capaldi; 4, Mr. and Mrs. Hodgkinson. **Fantails Calico:** 1, J. Amos; 2, T. McLean; 3 and 4, Mr. and Mrs. Hodgkinson. **Veiltails:** 1, B. Rothwell; 2, S. Howells; 3, J. Day; 4, T. Barnes. **Orandas, Metallic and Calico:** 1, P. Davies; 2, J. Day; 3, Mr. and Mrs. Pilling; 4, L. Thomas. **Orandas, Red Carp, Crucian and Biter:** 1, G. Bell; 2 and 4, W. Gregory and J. C. Platt; 3, S. Howells. **Moors:** 1, 2, 3 and 4, W. Ramsden. **Peorbales:** 1, J. Pollard; 2, Mrs. M. Dudley; 3, J. Larier and N. Hayes. **Lionheads:** 1, 3 and 4, V. Capaldi; 2, R. Pincock. **Robbie-eyes, Celestials and Telescope:** 1 and 2, S. Howells; 3, W. Gregory and J. C. Platt. **A.O.V. Twintail Goldfish:** 1 and 3, J. Pollard; 2, J. Amos; 4, P. Davies. **A.V. Twintail Goldfish Yellow or Variegated:** 1, P. Norman; 2, R. King; 3, Mrs. M. Midson; 4, Mrs. M. Franklin. **Novice A.V. Twintail Goldfish:** 1 and 3, Miss M. Thompson; 2, Mr. and Mrs. Pilling; 4, T. Barnes. **Matched Pairs-Bristol Shubunkins:** 1 and 3, G. Bell; 2, V. Cole; 4, J. Whiting. **A.O.V. Singletail Goldfish:** 1, D. Garland. **A.V. Twintail Goldfish:** 1, B. Rothwell; 2, J. Day; 3, W. Webby; 4, W. Ramsden. **Goldfish bred in 1982-Bristol Shubunkins:** 1 and 4, V. Cole; 2, J. Whiting; 3, B. Rothwell. **Veiltails:** 1, 2 and 3, J. Day; 4, B. Rothwell. **Orandas:** 1, 2, 3 and 4, J. Day. **Moors:** 1, 2, 3 and 4, W. Ramsden. **Lionheads:** 1, Mr. and Mrs. Hodgkinson; 2, W. Cumberland. **A.O.V. Goldfish:** 1, V. Capaldi; 2, Mr. and Mrs. Hodgkinson; 3, J. C. Platt and W. Gregory; 4, J. Day. **Teams of four fish bred 1982-Bristol Shubunkins:** 1 and 2, V. Cole; 3, B. Rothwell; 4, J. Whiting. **Veiltails, Orandas or Moors:** 1, B. Rothwell; 2 and 3, W. Ramsden; 4, A. King. **A.O.V. Goldfish:** 1 and 2, V. Capaldi; 3, J. C. Platt and W. Gregory; 4, Mr. and Mrs. Hodgkinson. **Pond or River Fish, Koi:** 1, L. Mimbrenet. **Koi, Pond and River Fish-A.V. Pond or River Fish:** 1, E. Franklin; 2, C. Hayes; 3, Mrs. E. Stevens; 4, J. Larier and N. Hayes. **Koi Carp up to 9 in.:** 1, 2 and 3, Mr. and Mrs. Pilling; 4, C. Hayes. **Koi Carp over 9 in.:** 1, Mr. and Mrs. Pilling.

THE Dorchester Tropical Fish Society's open show was held on 15th August at the Boys' Brigade Hall, Weymouth Avenue, Dorchester. The show attracted some 255 entries from all over Southern England, including members of Poet Talbot, North Wilts, Dorset, Bournemouth, Yeovil, Taunton, Southend, London, Transport, Salisbury and Herdon clubs. Best fish in show and best tropical fish went to B. Symes (Dorchester) with a *Pseudotropheus chameleo*. Best coldwater fish went to K. Bhan (Yeovil) with a common goldfish. Best livebearer and the

F.R.A.S. Championship trophy (Class R) went to J. Egan with a Red Wagtail Puffin. Other results: Class B: 1, R. Adams (Salisbury); 2, G. Amey (Dorchester); 3, G. Fitzgerald (Dorchester); 4, B. Symes (Dorchester). B: 1, J. Egan (Port Talbot); 2, T. Dowell; 3, T. Berry (Dorchester); 4, B. Symes. C: 1, J. Egan; 2, A. Waller (Southend); 3, H. G. R. Johnson (Hendon); 4, C. Amey (Dorchester). Ch: 1, G. Fitzgerald; 2 and 3, B. Symes; 4, R. Perkins (Port Talbot). C: 1 and 2, B. Symes; 3, R. Cooper (Taunton); 4, M. Scadden (Dorchester). D: 1, C. Amey; 2, T. Guy (Dorchester); 3, G. Fitzgerald; 4, B. Symes. D: 1, C. Amey; 2, J. Egan; 3, G. Fitzgerald; 4, B. Symes. D: 1, C. Amey; 2, J. Egan; 3, G. Fitzgerald; 4, B. Symes. E: 1, 2 and 3, P. and N. Watts (Droitwich); 4, T. Guy. E: 1, K. Grace (North Wilt); 2, R. F. Adams (Salisbury); 3, H. G. R. Johnson (Hendon); 4, C. Amey. F: 1 and 2, H. G. R. Johnson; 3, R. Perkins; 4, M. Bree (Taunton). G: 1, T. A. Dowell; 2, P. and N. Watts; 3, J. Egan; 4, H. G. R. Johnson. H: 1, A. Waller; 2, H. G. R. Johnson; 3, A. Marlborough (Taunton); 4, J. Egan. J: 1, R. Young (Dorchester); 2, and 3, T. Guy; 4, F. Chapman (London Transport). K: 1 and 2, P. Cox (Bournemouth); 3, J. Egan; 4, R. F. Adams (Salisbury); 5, G. Fitzgerald; 6, P. Cox (Yeovil). L: 1, C. Amey; 2, D. Cox (Yeovil); 3, R. Young; 4, C. Palmer (Dorchester). M: 1, P. and N. Watts; 2, C. Amey; 3, B. Symes; 4, H. G. R. Johnson. N: 1, R. F. Adams; 2, J. Egan; 3, P. Cox (Bournemouth); 4, D. Cox. N: 1, R. Young; 2, R. F. Adams; 3, G. Fitzgerald; 4, P. Cox. O: 1, 2 and 4, T. Guy; 3, P. and N. Watts. P: 1 and 3, D. Cox; 2 and 4, P. Cox. Q: 1, J. Egan; 2, P. Chapman; 3, K. Grace; 4, A. Waller. R: 1 and 2, J. Egan; 3 and 4, C. Amey; 5, T. Guy. S: 1, T. Guy; 2, H. G. R. Johnson; 3 and 4, P. Chapman. T: 1, C. Fay (Dorchester); 2, R. Young; 3, P. and N. Watts; 4, P. Chapman. U: 1 and 2, K. Hains (Yeovil); 3, R. F. Adams; 4, R. Cooper (Taunton). V: 1, T. A. Dowell; 2, P. Chapman; 3, K. Blunn; 4, T. Dowell; 5, P. and N. Watts; 6, R. Fitzgerald. X: 1, A. Marlborough (Taunton); 2, P. Cox; 3 and 4, B. Symes. X: 1, R. Young; 2 and 4, P. Cox; 3, P. Chapman.

AT North Wilt, open show there were 336 entries with Mr. C. Tonna coming out on top with best in show. Results: Class A: 1 and 4, E. Southwood (Reading); 2, Mrs. J. May (Reading); 3, C. Tonna (Reading). B: 1 and 3, C. Tonna; 2, E. Adams (Salisbury); 4, N. Jackson (Reading). C: 1, J. Handley (Portsmouth); 2, S. Norris (Bracknell); 3, R. May (Reading); 4, Mrs. B. May. Ch: 1, M. Chapman (Basingstoke); 2 and 4, N. Jackson; 3, G. Fitzgerald (Dorchester). Ca: 1, W. Knight (Havant); 2, M. Monk (NWAS); 3, J. Handley; 4, P. Taylor (NWAS). Da: 1, P. Cripps (Newbury); 2 and 4, B. Symes (Dorchester); 3, C. Tonna. Db: 1 and 2, W. Knight; 3, G. Fitzgerald; 4, C. Curtis (Swindon). Dc: 1, G. Parrett (Reading); 2, D. Blandell (Abingdon); 3, L. Freeman (NWAS); 4, Mr. Down (Froehampton). Dd: 1, W. Knight; 2, J. May (Reading); 3, P. Cripps; 4, R. Cumming (N. Avon). E: 1 and 2, P. Handley (Portsmouth); 3, C. Curtis; 4, W. Knight. E: 1, R. Adams; 2, Mr. and Mrs. Griffiths; 3, W. Hastings (SELAS); 4, S. Norris (Bracknell). F: 1, M. Paxton (Basingstoke); 2, P. May; 3, R. Fitzgerald (Dorchester); 4, Mr. Johnson (Hendon). G: 1, Mr. and Mrs. Dowell; 2, M. Monk; 3, M. Chapman (Basingstoke); 4, D. Haskell (Reading). H: 1, N. Jackson; 2 and 3, W. Knight; 4, R. Adams. I: 1, N. Jackson; 2, A. Chaplin (Basingstoke); 3, C. Tonna; 4, D. Spence (N. Avon). K: 1, Mr. and Mrs. Griffiths; 2, N. Jackson; 3, B. Hastings (SELAS); 4, J. Jackson (Basingstoke). L: 1, P. Cripps; 2 and 4, N. Jackson; 3, R. Collier (Swindon). M: 1, A. Chaplin; 2, C. Tonna; 3, P. Handley; 4, S. Norris (Bracknell). N: 1, M. Chapman; 2, C. Tonna; 3, D. Blandell (Abingdon); 4, D. Ford (Bracknell). N: 1, M. Strange (Basingstoke); 2, D. Blandell; 3, B. Symes; 4, N. Binding (Chobham). O: 1, D. Ford; 2, P. Cox (Bournemouth); 3 and 4, G. Parrett (Reading). P: 1, 2 and 3, P. Cox; 4, L. Parrett (Reading). Q: 1, M. Chapman; 2, R. Lee; 3, W. Hastings; 4, K. Grace (NWAS). R: 1, P. Taylor

(NWAS); 2, Mrs. B. May; 3, B. Hastings; 4, C. Curtis (Swindon). S: 1 and 2, C. Curtis; 3, W. Hastings (SELAS); 4, S. Andrews (Bracknell). T: 1, P. Cripps; 2, J. Jackson; 3, G. Fitzgerald (Dorchester); 4, S. Andrews (Bracknell). U: 1, R. Southwood (Newbury); 2, D. Ford; 3, R. Fitzgerald; 4, R. Adams. V: 1, P. Taylor; 2, Dowell; 3, J. Jackson; 4, C. Curtis. W: 1 and 2, Mr. and Mrs. Dowell; 3, I. Pevoni; 4, C. Tonna. X: 1, C. Tonna; 2, R. Vee; 3, D. Spence; 4, Mr. Down. X: 1, C. Tonna; 2, D. Blandell; 3, J. Jackson; 4, R. Lee.

MIDLANDS AND WALES



Wellingborough & District A.S. open show held on 5th September at Westfield School for Boys, Wellingborough. Results: Best in Show: 2, Davies (Class Ch). Best Junior: R. Stanforth. Best Goldfish: Mrs. G. Parker. Class B: 1, P. Morye; 2, J. Richards; 3, D. and P. Lambert; 4, G. Rowney. Ba: 1, E. Davies; 2, D. and P. Lambert. C: 1, P. Morye; 2, D. and P. Lambert; 3, J. and P. Patching; 4, H. Sherriff. Ca: 1 and 3, J. Richards; 2, N. Craddock; 4, G. Rowney. Cb: 1, 2 and 3, E. Davies; 4, M. Rowney. D: 1, M. Such; 2, Mr. Rowney; 3, C. Swain; 4, G. A. Eches. Dn: 1, J. Richards; 2, R. Stanforth; 3, P. A. Hughes; 4, Mr. Rowney. E: 1, P. Morye; 2, M. Kirkham; 3, Mr. Rowney; 4, M. Wright. E: 1 and 4, T. Ward; 2, M. and B. Coe; 3, Mrs. A. Neish. F: 1, G. A. Eches; 2, T. Ward; 3, B. Hall; 4, D. and P. Lambert. G: 1, Byron and Larman; 2 and 3, M. Kirkham; 4, G. Rowney. H: 1, Mr. Rowney; 2, P. Morye; 3, J. Richards; 4, G. Rowney. I: 1, W. Earl; 2, M. and B. Coe; 3, N. Craddock; 4, A. Henderson. K: 1, Mrs. A. Smith; 2, N. Craddock; 3, Mr. Rowney; 4, M. Wright. L: 1, P. Morye; 2, A. Hines; 3 and 4, M. Such. M: 1, W. Earl; 2, Mr. and Mrs. R. Hall; 3, E. Davies; 4, D. and P. Lambert. N: 1, M. Kirkham; 2, J. Richards; 3, H. Sherriff; 4, A. Henderson. N: 1 and 2, M. Craddock; 3 and 4, R. Bryan. O: 1, I. Smith; 2 and 3, R. Stanforth. P: 1, R. Bryan; 2, M. Kirkham; 3 and 4, R. Stanforth. Q: 1, M. Craddock; 2 and 4, R. Bryan; 3, P. A. Hughes. R: 1, R. Bryan; 2, N. Oakes; 3, I. D. Maylin. T: 1, D. and P. Lambert; 2, M. and B. Coe; 3 and 4, N. Craddock. U: 1, Mrs. G. Parker; 2, R. Vickers; 3, Mrs. D. Wood; 4, S. Vickers. V: 1, 2 and 4, Mrs. G. Parker; 3, Mr. A. Wood. W: 1, A. Burton; 2, A. and M. Coe; 3, N. Craddock; 4, Mrs. G. Parker. X: 1, A. Brown; 2, M. Kirkham; 3, Mr. and Mrs. R. Hall; 4, G. A. Eches. X: 1 and 2, D. and P. Lambert; 3 and 4, R. Stanforth.

NEW SECRETARY

THE new Show Secretary of Forest Town A.S. is Mr. A. R. Smith, 71 Southwell Close, Kirkby-in-Ashfield, Notts. (Tel: Mansfield 757665).

NORTH



Northern Goldfish and Pondkeepers' Society sixth open show results: Common Goldfish: 1, 2 and 3, I. Milson; Cones: 1, T. and C. Platt. Bristol Shubunkins (3 in): 1 and 3, V. Cole; 2, A. King. Bristol Shubunkins over 3 in: 1, V. Cole; 2, A. King; 3, B. Rothwell. Veiltails: 1, J. Day; 2, P.

Johnson; 3, B. Rothwell. Moors: 1, 2 and 3, W. Ramsden. Orandas: 1, S. Wilson; 2, W. Gregory; 3, Mr. and Mrs. Coley. Lionheads: 1 and 2, V. Capaldi; 3, R. Pincock. Fantails (Cello): 1, 2 and 3, Mr. and Mrs. Hodgkinson. Fantails (Metallic): 1, Mr. and Mrs. Hodgkinson; 2, V. Capaldi. Bubble eyes and Celestials: 1 and 3, D. Anderson; 2, M. and J. Gregory. Pearlscales: 1, 2 and 3, J. Laner and N. Heyes. A.O.V.: 1 and 2, J. Baxter; 3, J. and M. Gregory. London Shubunkins: 1, 2 and 3, S. Andrews. Breeders (Shubunkins): 1, V. Cole; 2 and 3, B. Rothwell. Breeders (Veiltails): 1 and 3, B. Rothwell; 2, A. King. Breeders (Moors): 1, 2 and 3, W. Ramsden. Breeders (Fantails): 1, 2 and 3, T. McLean. Breeders (Lionheads): 1, 2 and 3, Mr. and Mrs. Hodgkinson. Goldfish: 1, 2 and 3, T. and C. Platt and W. Gregory. One fish bred 1982 (Single tail): 1 and 3, B. Rothwell; 2, A. King. One fish bred 1982 (Twin tail with dorsal): 1 and 2, A. King; 3, W. Ramsden. One fish bred 1982 (Twin tail without dorsal): 1, 2 and 3, Mr. and Mrs. Hodgkinson. Pond fish (Europium): 1 and 2, M. Bough; 3, T. and C. Platt. Pond fish (Non-Europium): 1, B. Gregory; 2, M. Bough; 3, T. and C. Platt. Matched Pairs: 1, B. Rothwell; 2, L. Baxter; 3, T. and C. Platt. Novice Class: 1, G. Williamson; 2 and 3, T. and C. Platt. Best Fish in Show was won by B. Rothwell with a beautiful coloured Shubunkin which was bred this year. This fish also won the Nationwide Trophy. Best overall breeders' team who took the Aquarist Trophy and also the Best Exhibit on Show was a team of Bristol Shubunkins bred by Vic Cole from Bristol.

Wyke Show Society, were very pleased with the entries at their 3rd Annual Open Show. People attended from all parts of Yorkshire and Lincolnshire. Entries totalled 319 from 14 societies plus 4 independents. Top society was H.A.C.G. (Scunthorpe) with 40 points; second was Wyke S.S. (35 pts); 3rd was Grimsby & Cleethorpes (30 pts). Best exhibit in show was a breeder's one entered by Mr. and Mrs. Bradbury of H.A.C.G. Society. Best fish in show (Chama Obscura) was entered by Mr. and Mrs. Ashton, of Wyke S.S. and gained 80 points and now qualifies for the British Aquarist Festival "Champion of Champions" contest to be held at Belle Vue, Manchester on 6th and 7th November. The fish were judged by four Y.A.A.S. "A" class judges and three Y.A.A.S. "B" class judges were in attendance—"A": T. Douglas (Hull); R. Singleton (Darfield); N. Binkley (Brid.); B. Clutter (Workshop); "B": K. Fisher (Forest Town); M. Price (Castleford); K. Webb (Scarborough).

TROPHY winners at the Buxton and District A.S. show. Livebearer: J. and K. Corbett (Marsydale). Anabantid: Mrs. D. A. Smithurst (Forest Town). Barb: R. M. Smithurst and Son (Forest Town). Characin: R. M. Smithurst and Son. Cichlid: M. A. Hodgsworth (Forest Town). Also Best in Show, Carfish or Loach: J. T. Morris (Sandgrounders). Killifish: Mr. and Mrs. M. Parrow (Lincoln). Rastros: Daniel or Minnow: Mr. and Mrs. D. Armit (Buxton). Snake or Fox: Mr. and Mrs. Baldwin (Sandgrounders). A.O.V. Tropical: R. M. Smithurst and Son. Marine: R. Leyland (St. Helen's). Pla: J. T. Morris. Breeders (Teardrop): J. T. Morris. Junior: Master A. Smithurst (Forest Town). Gold-water P. Wade (Oldham). Mollusc or Novelty: B. W. Carter (St. Helen's). Trophy for the Society with most points: Forest Town.

OBITUARY

It is with regret I have to note the passing of James Stott, 71, who was one of the founder members of the Halifax and District Aquarist Society and a contributor over many years to the *Aquarist* or *Pondkeeper*.

Jim was a very great help to me, personally, in my early days and has been an inspiration to us all.

He will be sadly missed and our condolences go out to his wife Lorna May.

DAVID SHILLON,
Halifax A.S.

SCOTLAND



Edinburgh A.S. open show results: A.O.S. Livebearers: 1, M. Walker (EAP) (Best Livebearer); 2, G. and R. Dingwall (WAS); 3, A. Rennie (EAP). Barbs (A): 1, G. Talbot (FAS); 2, G. and R. Dingwall; 3, E. Mann (FAS). Barbs (B): 1, E. Mann (Best Barb). Characins (A): 1 and 2, H. Hoey (DAS); 2, T. Ramsay (K.A.S.). Characins (B): 1 and 2, E. Mann; 3, T. Ramsay. Characins (C): 1, J. Milligan (DAS) (Best Characin); 2, E. Duke (CAS); 3, B. Fleming (DAS). Rasboras: 1 and 2, J. Wells (DAS) (Best Rasbora); T. Minnow; 2, T. Ramsay. Danios: 1, J. Wells; 2, 3, G. and R. Dingwall. Egg-laying Tooth Carps: 1 and 2, W. Reid (CAS); 3, G. and B. Dingwall. Siamese Fighters: 1, T. Ramsay (Best Anabantid); 2, G. and R. Dingwall; 3, B. and V. Downie (A.O.S.). Trichogaster species: 1, G. Talbot (FAS); 2, D. Stephen (KAS); 3, A. Purdie (DAS). Colisa species: 1, T. Ramsay; 2 and 3, A. Black (EAS). A.O.S. Anabantids: 1, G. Talbot; 2, J. and M. Gilchrist (EAS); 3, J. McCallum (FAS). Dwarf Cichlids: 1, S. Meldrum (FAS); 2, T. Ramsay; 3, G. Dingwall. Rift Valley Cichlids: 1, P. McNeil (DAS); 2, J. Steven (AAS). Angles: 1, T. Ramsay; 2, T. McKirdy (AAS); 3, M. Turnbull (KAS). Large Cichlids: 1, T. Ramsay (Best Cichlid); 2 and 3, R. Chalmer (BCA). Catfish Corydoras: 1 and 2, T. McKirdy; 3, J. Milligan (EAS). Catfish Synodontis: 1, J. Milligan; 2, H. Hoey (DAS); 3, E. Mann. Catfish A.O.V.: 1, G. Talbot (Best in Show); 2, S. Booth (GAS); 3, A. Scott (NAS). Common Goldfish: 1, E. Hanratty (SGG); 2, A. Rennie (EAP); 3, C. Beardmore (BDAS). Shubunkins: 1, D. Anderson (SGG); 2, A. Rennie; 3, R. Lomas (EAP). Veiltails: 1, C. Beardmore (EAS); 2, R. Lomas (EAS); 3, S. Wilson (EAS) (Best Coldwater); 2, H. Shields (EAP); 3, T. McLean (SGG). Dorsals: 1, D. Anderson (A.O.S. Coldwater); 1, J. Milligan; 2, A. Little (KAS); 3, M. Coltart (GAS). Guppy (Male): 1 and 2, J. Wells; 3, G. Dingwall. Guppy (Female): 1 and 2, H. Hoey; 3, R. Christie (EAS). Mollies: 1 and 2, J. R. Steven (EAS); 2, A. Purdie. Plantes: 1, J. and M. Gilchrist (DAS); 2, S. McInosh (MAS); 3, J. R. Steven. Swordtails: 1, J. and M. Gilchrist; 2, L. Davidson (EAS); 3, J. Milligan. Sharks: 1, L. Davidson (Best Shark and Louch); 2, D. Wells (DAS); 3, S. Davis (NAS). Loaches: 1, G. Dingwall; 2, D. Penden (DAS); 3, J. and M. Gilchrist. Egg-layers A.O.S.: 1, D. Long (DAS); 2, D. Meldrum (FAS); 3, D. Dobbie (DAS). Pairs (Livebearers): 1, M. Walker (EAP); 2 and 3, H. Shields (EAP). Pairs (Egg-layers): 1, D. Dobbie; 2, D. Long; 3, H. Hoey. Plants: 1, H. Hoey. Breeders (Guppies): 1, G. Brown (KAS); 2, D. Long. Breeders (Mollies): 1, R. Bell (EAS); 2, C. Beardmore. Breeders (Swordtails): 1, J. Milligan; 2, R. McInosh (MAS); 3, D. Long. Breeders (Plantes): 1, J. Wells; 2, W. Todd (KAS); 3, R. McInosh. Breeders (Livebearers): 1 and 2, G. Kane (KAS) (Best Breeders); 3, H. Shields (EAP). Breeders (Egg-layers) (A): 1, T. McKirdy (AAS). Breeders (Egg-layers) (B): 1, W. Reid (CAS). Breeders (Egg-layers) (C): 1, R. Bell (EAS); 2, W. Reid; 3, B. and V. Downie (NAS). Breeders (Egg-layers) (D): 1 and 2, C. Beardmore; 3, W. Reid. Breeders (Coldwater): 1 and 2, C. McLean (SGG); 3, B. and V. Downie. Number of entries 305.

Key to abbreviations: A.O.S.: AAS; Bonyvegg A.S.: BAS; British Cichlid Association: BCA; Crangshill A.S.: CAS; Cambernald A.S.: CAS; Dalnair A.S.: DAS; Dunfermline A.S.: DAS; Edinburgh A.S.: EAS; Edinburgh A. Pondkeeper: EAP; Forfar A.S.: FAS; Gorebridge A.S.: GAS; Kirkcaldy A.S.: KAS; Mairhouse A.S.: MAS; Newbattle A.S.: NAS; Stirling A.S.: SAS; Scottish A.S.: SAS; Scottish Goldfish Group: SGG; Whitburn A.S.: WAS.

Dunfermline & District A.S. open show results: Guppies: 1 and 2, J. Wells (Dunfermline); 3, H. Hoey (Dunfermline). Plantes: 1, J. and M. Gilchrist (Stirling); 2, J. R. Steven (Aberbroath); 3, J. Wells. Mollies: 1 and 2, J. R. Steven; 3, A. Purdie (Dunfermline). Swordtails: 1, J. and M. Gilchrist; 2, D. McFarlane (Stirling); 3, D. Long (Dunfermline). A.O.S. Livebearers: 1, R. and S. McInosh (Mairhouse); 2, J. McFaul (S.M.T. & East Kilbride); 3, J. Milligan and G. Kane (Edinburgh & Kirkcaldy). Characins 'A': 1, T. Ramsay (Scottish); 2, H. Hoey; and 3, Characins 'B': 1, T. Ramsay; 2, D. Dobbie (Dunfermline); 3, D. Sweddon (Dunfermline). Characins 'C': 1, P. Henry (Dunfermline); 2, E. Duke (Crangshill); 3, P. McNeil (Dunfermline). Barbs: Temnosia: 1, P. Henry; 2, E. D. Mann (Forfar); 3, D. Dobbie. A.O.V. Barbs 'A': 1, W. Brown (Dunfermline); 2, T. Ramsay; 3, E. D. Mann. Barbs 'B': 1 and 2, E. D. Mann; 3, J. Carmichael (Scottish). Small Cichlids: 1, S. Meldrum (Forfar); 2, E. D. Mann (Forfar); 3, D. Dobbie. A.O.V. Barbs 'A': 1, W. Brown (Dunfermline); 2, T. Ramsay; 3, E. D. Mann. Barbs 'B': 1 and 2, E. D. Mann; 3, J. Carmichael (Scottish). World Cichlids: 1, J. G. Johnson; 2, P. McNeil; 3, W. McFarlane (Aberdeen). Tropical Minnows: 1 and 2, G. Dingwall (Whitburn); 3, J. Wells. Danios: 1, J. Wells; 2, D. Long; 3, G. Dingwall. Catfish 'A': 1 and 2, J. and E. Mann (Stirling); 3, G. Talbot (Forfar). Catfish 'B': 1, P. Henry; 2, M. S. Booth (Gorebridge); 3, R. Kavanagh (Kirkcaldy). Loaches: 1, J. and L. Makin; 2, A. Mitchell (Graigsmoath); 3, B. Fleming (Livingston). Egg-laying Tooth Carps: 1 and 2, W. Reid (Cambernald); 3, W. Brown (Dunfermline). Siamese Fighters: 1, A. Mitchell (Independent); 2, G. Talbot (Forfar); 3, W. Hetherington (Dunfermline). A.O.V. Anabantid: 1, J. Kavanagh (Kirkcaldy); 2, J. McCallum (Forfar); 3, D. Cameron (Dunfermline). Siamese Fighters: 1, A. Whyte (Dunfermline); 2, G. Dingwall; 3, T. Ramsay. Silverides: 1, J. Henry (Dunfermline); 2, G. Talbot; 3, J. Wells. Snails: 1, J. Wells; 2, W. Hetherington; 3, E. D. Mann. Rasboras: 1, J. Wells; 2, W. Hetherington; 3, W. Reid. A.O.S. Egg-layers: 1, D. Long (Dunfermline); 2, C. Henry (Dunfermline); 3, S. Meldrum (Forfar). Paris Guppies: 1 and 2, J. Wells; 3, C. Henry. Pairs Mollies: 1, Milemark Hospital (Independent). Pairs Swordtails: 1, J. Wells; 2, J. Gilchrist (Stirling); 3, D. Long. Pairs A.O.S. Livebearers: 1, G. Kane (Kirkcaldy); 2, R. McInosh (Mairhouse); 3, J. Milligan (Edinburgh). Pairs Egg-layers: 1, J. Wells; 2, T. Ramsay; 3, D. Dobbie (Dunfermline). Breeders Guppies: 1, G. J. Brown (Kirkcaldy); 2, D. Long. Breeders Plantes: 1, W. Todd (Kirkcaldy); 2, J. Wells; 3, S. McInosh (Mairhouse). Breeders Mollies: 1, R. Bell (Stirling). Breeders Swordtails: 1, D. Long; 2, R. McInosh (Mairhouse); 3, D. McFarlane (Stirling). Breeders A.O.S. Livebearers: 1 and 2, G. Kane (Kirkcaldy); 3, R. McInosh (Mairhouse). Breeders Egg-layers 'D': 1, W. Reid; 2 and 3, W. McFarlane (Aberdeen). Breeders Egg-layers 'C': 1, W. McFarlane; 2, R. Bell (Stirling); 3, W. Reid. Breeders Egg-layers 'B': 1, J. O'Sullivan (Dunfermline); 2, W. Reid. Breeders Egg-layers 'A': 1, G. Kane (Kirkcaldy); 2, A. Mitchell (Graigsmoath); 3, J. and L. Makin (Stirling). Breeders Coldwater: 1, C. Downie (Newbattle). Shubunkins: 1, A. Rennie (Edinburgh); Common Goldfish and Comet: 1, A. Rennie (Edinburgh); 2, D. Smith (Greenock). A.V. Double Tailed Goldfish: 1, S. McCallum (Gorebridge); 2, H. Shields (Edinburgh); 3, G. McNeil (Dunfermline). A.O.V. Coldwater: 1, J. Milligan (Edinburgh); 2 and 3, M. Hoey (Dunfermline); 2, T. Ramsay; 3, H. Hoey. Furnished Jar: 1 and 2, H. Hoey; 3, G. Dingwall (Whitburn). Best Livebearer: R. McInosh. Best Characin: T. Ramsay. Best Barb: W. Brown. Best Cichlid: J. G. Johnson. Best Danio or Tropical Minnow: G. Dingwall. Best Catfish: J. and L. Makin. Best Louch: J. and L. Makin. Best Anabantid: T. Ramsay. Best Siamese Fighter: A. Whyte. Best Silveride: I. Henry. Best Shark: J. Wells. Best Rasbora: J. Wells. Best Egg-layer: D. Long. Best Pair and Practical Fishkeeping: Top Tank Award: G. Kane. Best Breeders Live and Practical Fishkeeping: Top Tank Award: G. Kane. Best Breeders Egg-layer: G. Kane. Best Coldwater: J.

Milligan. Best Furnished Jar: H. Hoey. Dunfermline member with Highest Points: J. Wells. Competitive with Highest Points: J. Wells. Best Fish in Show: R. McInosh. Total number of entries: 419.

WINNERS of the Scottish Goldfish Group's show held in Dunfermline. Common Goldfish and Comet: 1, E. Hanratty; 2, D. Anderson; 3, S. Wilson; 4, E. Lindsay. Shubunkins: 1 and 2, A. King; 3, P. Anderson; 4, E. Lindsay. Veiltails: 1, I. McFormid; 2, A. King; 3, P. Anderson; 4, E. Lindsay. Fancies: 1, 2, 3 and 4, T. McLean. Dorsals: 1, D. Anderson; 2, P. Anderson; 3, R. Coburn; 4, A. King. A.O.V. Doubletail: 1, S. Wilson; 2 and 3, P. Anderson; 4, I. McFormid. Singletail Breeders (team of 4): 1, 3 and 4, P. Anderson; 2, A. King. Doubletail Breeders (team of 4): 1, 2, 3 and 4, A. King. Singletail Breeders (single fish): 1 and 2, A. King; 3 and 4, D. Anderson. Doubletail Breeders (single fish): 1, 2, 3 and 4, A. King. Novice Class: 1, S. Wilson; 2, E. Hanratty; 3, D. and P. Smith; 4, G. Scott. Best Singletail: E. Hanratty (Common Goldfish). Best Doubletail: T. McLean (Fancy). Best Breeder: A. King (Breast Shubunkin). Most Pointed Exhibition: A. King. Apparatus Magazine: Best Fish in Show and Apparatus Gold Pin: E. Hanratty (Common).

Dates for the diary

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

NOVEMBER

7th November: The Norwich Section of the **BRITISH Koi KEEPER'S SOCIETY** are holding their monthly meeting at the home of Mr. D. M. Strang at 2.30 p.m. at 5 Parklands Green, Farnham, St. Giles, Bury St. Edmunds, Suffolk.

14th November: **BRADFORD & DISTRICT A.S.** open show at Clayton Village Hall, Clayton, Bradford. Further information available from the Show Secretary.

18th November: **HARENGEY A.S.** guest speaker Mr. Ian Sellick, of the British Cichlid Association, to talk on Cichlids, at Pax Hall, 39 Park Road, Hornsey, London, 8 p.m.

20th November: **THE GOLDFISH SOCIETY OF GREAT BRITAIN** general meeting, at the Conway Hall, Red Lion Square, Holborn, London, W.C.1 at 2.30 p.m. For further details re this meeting and future events contact L. B. Clapp, F.R.O., Tel: 01-450 4994.

20th November: **CATFISH ASSOCIATION GREAT BRITAIN** open and Convention at Aylesford Lower School, Woodmill Lane, Edmonstone, London N19. Guest Speakers will be: Dr. Gordon Reid, Conservation Officer (Nat. Hist.); Merseyside County Council. Subject: Fish Collecting in the Night, and Mr. B. Rogers (CAS); Breeding Catfishes. Tickets from F.R.O., T. W. Giles, 10 Adelaide House, Pembroke Court, Portobello Road, London W11 2DD. (Tel: 01-727 7441).