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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers

The Black Belt Cichlid

American Sunfishes

(Colour feature)

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THE AQUARIST AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

Published Monthly 75p

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Peacock Blue Cichlid
(Aulonocara nyassae)
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A. van den Nieuwenhuizen

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WHAT IS YOUR OPINION?

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

My aquarium light bulbs still continue to blow. A Woolworth's Winfield bulb chalked up a score of 180 days; while a Mazda Brightlight bulb, with an initial average light output of 410 lumens, and a stated average life of 1,000 hours, lasted for 192 days; and a similar Mazda scored a very pleasing 203 days. If the bulbs were lit for an average of six hours daily the above results are quite pleasing.

I have not been so lucky with my fish of late. I searched Belfast some weeks ago for some cardinal tetras and discovered a total of only two. I bought the two small fish, together with a pair of young kribensis. Unfortunately the chap who served me put all four fish in the same bag. When I had travelled the 20 miles to my home I was saddened to discover that the kribensis—probably without intending to—had killed one of my two precious cardinals. The lone survivor remains alive and growing slowly.

I telephoned a couple of the shops again and learned that one dealer was in America and would bring home a thousand cardinals with him. Another dealer told me that he had just taken delivery of 1,000 cardinals and that they would be ready in a few days' time. Further phone calls to the latter shop brought distressing news as the days passed. If I got the information correct, every one of the 1,000 cardinals died before being sold!

Phone calls to the other dealer's shop were more rewarding: I made a trip to Belfast and bought 10 small cardinals. While I was at the shop I bought eight young, marbled angels —which leads me on to another sad story. Some weeks ago I introduced a new fish, of a different species, into my tank containing seven large, adult angels that I had had for some years. Several days later one of the angels died. Then another followed. Within a couple of days all the fish in the tank had died—and the whole aquarium was literally stinking. It was a most depressing sight!

I decided to clear everything out of the tank and start again with new gravel. I sorted my Java fern plants carefully and rinsed them well. Next I bought two 14 lb. bags of aquarium gravel and washed it. I scrubbed the flint rocks from the tank with a nail-brush, cleaned the tank, and started again. After the tank had been set up again for a few days I introduced the eight, young angels—they cost me 45p each. They settled in quite well but remained very nervous. To-night I introduced a pair of lively, young clown loaches that I've had for some months. I hope they will liven up the 24 in. × 12 on. × 12 in. tank and help to make the angels less shy. Incidentally, I was lucky enough to get the 70p young cardinals for 50p each. I must keep an eye on my gourami tank: I think it will be due for a complete clean, after about 12 years, quite soon.

I was intrigued today when the postwoman delivered a large, flat envelope of about 30 in. × 15 in. A giant Christmas card, I wondered. The label Swimmers appeared on the back of the envelope. Although I teach swimming to a total of about 80 youngsters each week I still could not identify the source of the package. Possibly a very large calendar I thought, as I began to open the large package. A letter in the flat package, written by Mr. Nicholas Harvey, Managing Director of Swimmers Limited, 197 King's Cross Road, London WC1X 9DB, enlightened me. Mr. Harvey wrote: "**. . . I am sending you one of our new Swimmers Undertank Heaters, which I hope you will accept with my compliments. If you would care to try the heater and report your findings in your excellent** *What Is Your Opinion?* **column in** *The Aquarist*, **this would of course be helpful, but please do not feel obliged to do so. I am equally interested in having your own personal comments on the product, and whether or not you agree with us that undertank heating will, over the next few years, largely replace the conventional glass-encased heaters, if only for reasons of safety.**" I don't wish to pass many further comments on this new product now because I have not yet had time to test it. It does require a separate thermostat to control it—either an external or an internal thermostat. The instructions state: "**. . . It is not submersible and should be disconnected immediately if your tank spills or leaks. . . .**" The unit I received is for a 24 in. × 12 in. tank and one places the heater on a suitable base, e.g. expanded polystyrene, and places the tank on top of it.

I have always been interested in the idea of undergravel heating—although I have never tried it. This new unit does not go under the gravel; it goes under the tank, on the outside. Despite this it should, in effect, supply undergravel heating from the outside of the tank bottom. I have always thought that such heating would probably encourage good plant growth because the gravel and lower water levels would not be cooler than the rest of the tank. (Obviously such is not the case if undergravel filtration is used; but I am not over-keen on U/G filtration anyway—although many people are.)

I don't think I can agree that glass-encased heaters will eventually be replaced **"for reasons of safety"**. I have kept tropical fish for many years and have never received a shock

because of a problem with a glass-encased heater. I don't think I have ever heard of a fatality resulting from the use of a glass-encased aquarium heater. I should be pleased to hear from readers who have. (Perhaps I should re-phrase that by making the point that I hope no one has ever heard of a fatality resulting from the use of a conventional glass-encased heater.) I would like to think that modern glass-encased heaters are perfectly safe.

One thing that I remain unconvinced about is the wonderful world of the silicon micro chip as applied to combined aquarium heaters/thermostats. Would any manufacturer like to try to convince me on this point? Obviously there are good units using the micro chip. I got one new unit and plugged it in. Nothing happened. It was faulty. I think the model was withdrawn from the market and re-designed. I obtained a replacement. It worked for a little while and then the neon indicator gave up the ghost—for whatever reason. The unit still controls the temperature but I have to check water temperature with eye or hand to find out if the unit is heating.

Another brand, that worked well when new, has now decided to make up for the lack of indicator light in the lightless unit mentioned above. This unit now switches its indicator light off and on every two seconds—which does not reassure me as it flicks on and off day and night. I'm sure the fish don't like it either. The other micro-chip combined unit that I had was supplied for a product review test. The manufacturer asked me to return it after I had completed my tests! I do not have any solo chip-controlled thermostats. When buying a combined unit now I go for a conventional one. I asked a young aquarist friend recently if he used micro-chip heater/stats. He told me that his unit had been consigned to a cupboard after giving up the ghost after a fairly short period of use. It seemed no coincidence that the brand of his unit was the same as that of my flashing off/on unit. Has anyone produced a small, chip-controlled, combined heater/thermostat—of about 8 in. in length—yet?

I'm writing this on 30th November and have already received several Christmas cards from kind readers. My sincerest thanks to them; and to any others who may send me cards in the next month—which will allow for the occasional late arrival from a foreign country.

Mr. John Skillcorn is Head of Biology at Hetton School, North Road, Hetton-le-Hole, Houghton-le-Spring, Tyne and Wear DH5 9JZ. He writes: **"I read with interest your latest collection of letters in the November 1982** *W.Y.O.*, **particularly the section on common clownfish,** *Amphiprion ocellaris*—**or has it been changed yet again?—spawning in your friend's aquarium. You may be interested to know that I too have a pair of these fish which, during the spring and early summer, were spawning every ten days. They were obtained two and a half years ago as tiny scraps, ill and hovering in the corner of a Sunderland dealer's tank. Naturally I bought them, although they were not exactly the fish I was looking for, and installed them in my 60 in. × 15 in. × 15 in. aquarium.**

"It was quite some time before they started to feed effectively, but gradually they took more and more until they fattened up and began to grow. They are now in splendid condition, living in a large *Stoichactis* **sp. anemone. The aquarium is not over-crowded by any means: I am confident with my few small but select fish and several of the more interesting invertebrates. Spawning is always preceded by the smaller male displaying to the by-a-third larger female, and then both fish rush off to clean a rock surface next to their anemone. The eggs are laid in typical cichlid fashion, but rarely last 24 hours. The pair are without doubt egg eaters! Temperature if 78°F and pH 8·3. Undergravel filtration is used but water changes are infrequent due to the small numbers and sizes of the contents.**

"Of the hobby in general I am particularly pleased with my latest acquisition which is housed in my laboratory here in school. It is *Protopterus annectens*, **one of the African lungfishes, being a half-grown specimen of a foot long. By putting it next to an aquarium housing my breeding axolotls,** *Ambystoma mexicanum*, **the obvious evoluntionary progression from lungfish to axolotl has impressed not only my pupils but myself as well. The fish had to be ordered specially, but was obtained by my dealers, Betta Aquaria, of Newcastle upon Tyne, in only a week. I was most impressed! A British-made washing machine took four weeks! Once I learn more about keeping this species and add to my photographs, I think that it will make a most interesting subject for an article in your magazine.**

"Finally, don't be so despondent! I was almost upset to read how you combine a tough profession with your writing. I'm in the same job and I can echo your words that it is a most frustrating and aggravating way of earning a living. Non-teachers scoff if you like, no doubt thinking about the holidays—don't they always?—but equated to extras put in by us, I at least lose out. Two thirds of my holidays are spent in either my lab or the school greenhouse. It's pleasant, true—but it's still work and, dare I say it, unpaid. As I often say, school would be great if it wasn't for the kids! Do keep writing: we need you! P.S. I have contacted Derek Knight re. axolotls with an offer he can't refuse!"

I appreciate your views, Mr. Skillcorn, and thank you for your kind comments.

Master Mark Christopher Delazarus does not give his age but I should guess he's about 13 or 14 years old. (Apologies Mark if you're 12 or 45!) Mark lives at 163 Bridge Road, Slade Green, Erith, Kent. He writes: **"I**

have just set up a new aquarium. It is 24 in. × 12 in. × 15 in. I have a U/G filter powered by an air stone. I have a large collection of plastic plants in the tank. The temperature is 80°F. I use to heat the tank with a Microtronic thermostat and heater as I find this (*sic*) is the best thermostat and heater on the market so far.

"At one end of the aquarium I have made a number of caves with some slate glued together. In this tank I have a collection of catfish which are fed on a mixture of dried shrimp, *Tubifex* and basic food. Because most of the fish will feed on the bottom of the aquarium what I do is soak the food in a net for a minute, then I feed the fish and the food just sinks down. Some of my *Corydoras paleatus* have just spawned, and my *C. aeneus* eggs are just hatching out. I also feed large amounts of live *Tubifex* worms, and sometimes live *Daphnia* and earthworms."

My thanks to those who kindly sent me the latest edition of the following publications: Midland Koi Association's *News*; British Koi-Keepers' Society's *Magazine*; and the news sheet published by The Goldfish Society of Great Britain. Each is an interesting publication containing news and articles.

Mr. John Carpenter, secretary of the Catfish Association of Great Britain, resides at 10 Thornbank Close, Stanwell Moore, Middlesex, and he kindly sent me a copy of the Association's latest publication—*Information Book No. 8*. This attractive publication has a glossy cover and stretches to 25 pages. The booklet has each of 23 of its pages devoted to a different species of catfish, the backs of most of the 23 pages being blank. Each species is illustrated with an excellent monochrome drawing, and details of distribution, size, colour pattern, anatomical characteristics, remarks and family are provided. The fish covered range from *Akysis leucorhynchus*, through several species of *Corydoras*, to *Vandellia cirrhosa*. Two other pages show four drawings of *Corydoras aeneus* and four of *C. habrosus*. I don't know the cost of the publication but it should certainly be of interest and use to those who like catfish.

Photographs 1 shows a couple of stems of *Egeria densa*, also known as *Elodea densa*. Please send me details of your experiences with this plant grown (a) outdoors in a pond; (b) in a coldwater tank; and (c) in a tropical tank.

Egeria densa

In my first *Meet the Aquarist* article, a couple of years ago, I introduced readers to East End aquarist Ron Baldry. I've made a couple of return visits to Ron's home since my original visit. As usual, when I visited them a few months ago, Ron and his wife Lily greeted me with typical East End hospitality. I was very interested to note what changes Ron had effected since my last visit. As Photograph 2 shows, Ron still has his outdoor pond, complete with Jaws, the giant goldfish. Several large koi from the pond were bought by an occasional contributor to this column whose letters always attract a large postbag from irate readers. No doubt the tale would have you rolling about with laughter, as it had me; but I'll resist the temptation to try to tell it to you. Sadly I cannot type with a Cockney accent. It's a tale that should be heard rather than read.

Ron Baldry beside his garden pond

Ron's fish house no longer contains tropical tanks; it contains some attractive coldwater fish in aquaria (see Photograph 3); but even more interesting is the indoor, coldwater pond that Ron maintains in his fish house. The fish house was too small for me to photograph very much of Ron and his indoor pond, but Photograph 4 gives some idea of the attractive scene. Note the plants sited above the pond, to make it blend into the fish house setting, and the attractive waterfall that keeps the pond filtered and aerated. The pond contained an interesting variety of coldwater fish, including koi. One quite large fish had a strange clear patch just behind its head. I asked Ron about it and he told me an interesting story. The fish had lived in the outdoor pond until one day when Ron found it with a large lump torn out of its head/back. The wound was quite serious and he moved the fish indoors, not expecting it to survive. He assumed that a cat had attempted to catch the fish and had injured it in the process.

The injured fish was treated with a special mixture that Ron made to fill the open wound. Fortunately it worked and the wound began to heal and close up as new cells were formed. Interestingly enough, the new cells did not contain the pigmentation evident in the rest of the fish's skin—so the new flesh is white in colour. No doubt Ron will let me know if the coloured pigment grows again

to hide the site of the injury. The fish is lucky to have such a caring owner as Ron.

Please drop me a line if you have grown the floating plant *Eichhornia crassipes*, the water hyacinth.

Mrs. Christine Knowles heads her letter 11 Hillside Close, Billinge, Nr. Wigan, Merseyside. She writes: **"On attending a Christmas fair on 20th November 1982 I was fortunate enough to obtain approximately 60 back numbers of *The Aquarist* to add to my collection. I have been keeping fish for only two-and-a-half years but at present I have 12 tanks running. It was with great interest that I read the March 1975 issue, re *Tilapia mariae* (the tiger or zebra cichlid). My experiences were, in some ways, somewhat similar to Mr. Dunleavy's. I purchased six 2 in. long fish from different sources—and they all turned out to be females. After almost 12 months, on a visit to a public aquarium, I was talking to the technician in charge who, luckily for me, had a fully-grown male that had been dreadfully bullied: its gill fins were in a sorry state, the dorsal fins nipped, and the tummy concave.**

"I brought him home on 7th September 1982 and placed him in a 60 in. tank containing six females—which by this time were almost 4 in. long—and two very large severums. Within 24 hours one of the females was following the male all over the tank. At 7.30 a.m. on 12th September I got out of bed and to my utter amazement I found the pair had spawned, right in the middle of the tank, on the roof of a plant pot. The other fish were hurriedly removed to another tank. Since then they have spawned again on 29th September and 7th November. The growth rate is phenomenal. Nine days from the actual spawning they eat trout pellets; and after removing the fry to a 36 in. tank they grow just as rapidly. Some of the first brood are now in a tank containing swordtails, large bleeding hearts, and guppies. At present, as well as breeding mariae, I am breeding port acaras, limias and the usual livebearers.

"I should be very grateful if any of your readers could tell me where I can obtain limias. Sadly I lost all my males and have only two females left. Also, where could I obtain a female *Cichlasoma portalegrense* as I am having difficulty in finding either sex? There was nothing at Belle Vue. If any of your readers would like some mariae young I would gladly swop them for other peaceful cichlid young—*not* Rift Valley types—or A.O.V. livebearer young, if they write to me."

Mr. Gerd Kullak-Ublick attends St. Paul's School, Lonsdale Road, London, S.W.13, and writes: **"I am 16 years old and read your column with interest every month. I have kept and bred many fish, but one of my favourites is still the butterfly cichlid, *Apistogramma ramirezi*, and I would like to relate my experiences in breeding this fish. When I first saw some butterflies I took five young ones home, not knowing what sex they were, and placed them with my breeding pair of angels in a 25 gallon tank. The water temperature was 26°C. By filtering tap water over a powerful peat I achieved a pH of 6·3, a D.H. of 2°, and a carbonate hardness of 1°. The water had an excellent light brown colour, and I filtered it using an Eheim power filter, at 270 litres per hour,**

One of Ron's Coldwater fish kept in an aquarium

Ron sitting beside the indoor pond in his Fish House

and a U/G filter, to remove any trace of nitrite. The tank was planted with *Echinodorus grisebachii* (Amazon sword sp.) and *Eleocharis acicularis* (hairgrass) to cover the bottom (I use fine gravel, about 2 mm. in diameter), a beautiful *Aponogeton ulvaceus* at the back, and thick clusters of *Vallisneria spiralis* and *Rotala macrandra* to fill out the background. A piece of slate was leaning against the right side of the tank, and the angels frequently spawned on this slate. A log supplemented the decoration, as did one or two first-sized rocks. Apart from the two angels the tank contained some red platies, and a few tetras of some sort.

"I placed the butterfly cichlids into this tank and they settled in well. Unfortunately one died after an attack of white spot; but the other four soon recovered. I fed the fish on frozen blood worms, and various assortments of Tetra flake foods. The butterflies enjoyed swimming through the clusters of *Echinodorus grisebachii*. As the fish grew they developed beautifully subtle colours: a blue abdomen, deep red eyes, and red-

tipped fins. There was a yellow tinge throughout their bodies and they gave me much pleasure. After a few months three developed a dark red in the abdominal region, and I deduced that these were females. The male did not dev--elop an elongated dorsal spine, contrary to what I had read, but was very active and healthy.

"Around the middle of April last year I discovered that one of the females was cleaning a rock. I was very excited because I knew what this meant. Two days later I found about 150 eggs on the rock. The female was hovering over them and fanning water on them, and I was glued to the spectacle for many hours. But on the second day I discovered that the eggs had gone. I was most shocked and wondered if the angels had done it. I did not know what to do, and furiously decided that I was no longer interested!

"But only a week later, when I came to feed them one evening, I saw about 30 eggs on a different rock. I was elated and watched how a different female was spawning with the male: the female glided over the rock, stretching out her ovipositor very far, and stuck about 10 eggs on in one go—all in a neat row. Then she swam away sideways and the male quickly moved over the eggs and fertilized them. The process continued until about 200 eggs were laid. This lasted about one-and-a-half hours.

"On the next morning they were all still there, and the female stood above them, while the male ardently chased away any intruders. The female would not eat during the incubation period and was constantly re-arranging the eggs on the rock. On the third morning the fry were hatching: they hung out by threads which disappeared after some hours. The brood was carried into a small depression that the female had dug next to the rock. She watched closely over the fry and never let them move.

"After a further six days the fry were active and followed their parents in a huge swarm. There were about 170 and the sight of them all together was delightful. I hatched (brine shrimps) every day and directed a swarm of them towards the babies with the aid of a very thin tube. The babies devoured them greedily and I could always see how their little stomachs were full to the brim.

"They have grown very well—there are about 100 left. I moved them to a separate tank when they were a month old, and fed them exclusively on blood worms and Tetra flakes. I intend to sell them soon and try my hand at *Julidochromis dickfeldi*. I feel that the secret about *Apistogramma ramirezi* is to buy them young so that when they grow they can spawn in familiar surroundings. It appears that no real pair formation occurs, but that a *breeding community* is common. I think that factors such as the amount of tannic acid in the water are important: the black-water, which is soft and acidic (the peat contains tannic acid which lowers the pH of the water), is ideal; filtering over peat also reduces the conductivity to a desirable level, i.e. about 120 µS. I recommend this fish only to the keen hobbyist who can provide the right conditions, for if he can then this is one of the most rewarding dwarf cichlids." (Gerd kindly sent me a colour enlargement of the head portion of a 'ram' and accompanied it with the comment: "I apologise about the badness of the photo!")

Another bulb has blown. This time it was a Woolworth's brand and it lasted for 73 days—beginning in September.

My thanks to Mr. D. M. Armitage, 2 Close End, Robert Road, Hedgerley, Bucks., for the latest edition of *Labyrinth*, the magazine of the Anabantoid Association of Great Britain. The latest newsletter contains 12 pages of interesting fact and opinion and is edited by Mr. Armitage. It's pleasing to see so many groups of aquarists—both specialist and general—producing their own magazines. I think such publications, no matter how simple, help to give groups an identity—for themselves and for members of the general public.

Although I have still got a lot of letters left unused this month—mostly because they are *very* long—I have used up my allocation of space. For a future issue I should be pleased to receive some shorter letters, e.g. two or three sides, written, on 'standard' writing-pad pages; one-and-a-half sides, written, of A4 paper; or, say, about one typed side of A4. Naturally longer letters will not be excluded—but shorter ones have a better chance of getting fitted in to fill up small spaces. For a future issue please send me your opinion on anything that takes your fancy; and on any of the following: (a) tablet foods and prices; (b) micro-chip-controlled combined heater/themostats; (c) clown loaches; (d) cultivating unusual aquarium plants; (e) tungsten bulbs and plant growth; (f) filtration in marine aquaria; (g) good air pumps; (h) undergravel heating; (i) your tortoise in hibernation; (j) keeping snakes; (k) the cost of heating tropical tanks in winter; and (l) selling young fish that you have bred. I hope I'll receive a letter from you this month.

DISCOVER THE FISH

By Pisces—

The first is in PELLET but not in FLAKE
The second is in SKID but not in BRAKE
The third is in FIBRE but not in GLASS
The next is in ALLOY and also in BRASS
The next is in LINERS but not in POOL
The next is in HAMMER but not in TOOL
The last is in FOUNTAIN but not in JET

PHNPHd

THE CONSTRUCTION OF AN ECONOMIC FISH HOUSE

By Dr Peter A. Lewis, PhD

Part 2

THE last article discussed the aspects of location, materials of construction and insulation as part of a checklist of items to consider prior to beginning your fish house project. We still have several items to consider prior to launching into our project remembering that a little forethought can result in considerable savings in time and patience.

Heating and Lighting

Probably the largest single ongoing expenditure that the fish house will generate is the cost of heating and lighting. As a general rule space heating coupled with fluorescent lighting proves the most economical especially if due care has been paid to the need for insulation.

Space heating refers to the heating of the whole area or space occupied by the fish tanks and equipment. Separate, in-tank heater/thermostat combinations are not required and any body of water placed in the heated area will gradually assume the temperature of the heated area. Since hot air rises the tanks at the upper levels of the fish house will be warmer than those near floor level. This fact is used to advantage by breeders who want to stimulate breeding interest in a pair of conditioned fish as they will transfer pairs from relative cool water in the lower tanks to warmer water in the higher tanks. My experience has been that in a fish house thermostatically controlled at 78°F there can be 4-6°F difference between tanks on a shelf one foot off the floor and tanks six foot off the floor.

Ideally space heating requires two pieces of equipment; a heat source and a regulator for that source. The cleanest and most convenient heat source is an electric element coupled with an in-line thermostat that controls power to the element. The best combination is a fan assisted heater rated at 2-3 kilowatts wired through a manually adjusted, wall mounted thermostat at a setting of 72-74°F dependent upon preference. Do not mount the thermostat in direct line with the fan heater or close to the ceiling or a window or door otherwise false readings and poor control will result.

Whilst it is the cleanest and most convenient an electric heater can also be the most expensive. Next to consider is the use of a paraffin heater as used in greenhouses for frost protection in Winter and early Spring. Purchase and storage of paraffin in five gallon quantities is most common and it has been my experience that 5 gallons will maintain an eleven foot long, eight foot wide, and seven foot six inch wide fish house at 72-76°F for 10-14 days dependent upon the season. Any user of paraffin will immediately notice its smell, even though considerable improvements have been made in purifying the chemical over the last 25 years such that a cleaner burn is achieved; additionally one also notices the white scum that forms across the surface of unaerated tanks or buckets of water left in the fish house. This white scum is most definitely a feature of paraffin heaters and will increase if the wick is not regularly cleaned and the flame not burned sufficiently hot. It is readily removed from still tanks by drawing a sheet of tissue across the scummed surface. The scum adheres to the tissue which is discarded. Within two days the scum will be back again. My experience has shown that this scum will not manifest itself on the surface of well aerated water although it must have settled somewhere. Additionally, based on the number of fish I have kept and bred, it does not appear to harm the fish.

The choice of electricity or paraffin seem to be the most popular amongst aquarist I have known and have been the two methods of heating I personally have used. Other ways to be given due consideration are the use of a gas convection heater as installed by a qualified fitter or alternatively the routing of a hot water circulation feed to a hot water radiator located in the fish house such that the main house heating system feeds the fish house. Points to remember in using either type of heating where a naked flame is involved, i.e. gas or paraffin, is to always allow sufficient draught to enter the structure to fuel the flame and that both methods form large amounts of water vapour which can cause massive condensation problems when used in an uninsulated structure.

The choice of lighting is relatively simple since the use of four foot or six foot combinations of fluorescent tubes provides by far the most light for the least cost. My only other comment on lighting is to the use of a low wattage (8-10 watt) night light which can be left on during the hours of darkness after "lights out" in the fish house. This small light, particularly in fish houses which have no natural light entering, prevents a sudden cut-off from day to night or vice versa as the lights are suddenly turned off or on either through a time clock or manually; additionally it provides sufficient light for catfish to forage by during their prime activity hours.

Water Heating

Almost by definition of the hobby an aquarist needs both a source of water supply and a means of water disposal. The use of buckets to trek water to and from bays of tanks in a fish house is a soul destroying task and one which rapidly results in a diminished rate of tank clean-out frequency. Ideally, a hot and cold water supply can be piped from the house, delivered to a mixer tap with a threaded outlet and from there to the required tank at a premixed temperature via a length of hose coupled to the threaded tap. Alternatively, a source of cold water only can be piped to the fish house and plumbed into an electric water heater of the type used in shower installations. This device rapidly heats the incoming water to a predetermined temperature for delivery to the tank. Remember, however, to consider the danger of a pipe freezing if exposed on its way from the home to the fish house.

As far as removing the unwanted water from the fish house this obviously calls for some sort of a drain. Ideally a drain should be located inside the fish house and should key into the local fresh water draining system serving your property. As a second choice, lead a polythene pipe through the floor of the fish house to a previously rock filled soak-away constructed beneath the fish house during the early excavation work. When siphoning water and debris from a tank direct to a drain it is advisable to have some intermittent "catch pot" containing a filter mesh that will prevent gravel or fry from going un-noticed direct to the drain.

An alternative water supply that is always available in a country like ours is, of course, rain water. This source is particularly desirable for those aquarists who intend to keep fish that require soft water in their tanks such as many killie fish, small characins and Discus. Here, the fish house, if located outside, can be fitted with plastic guttering to collect water from the roof and deliver it to a plastic rain barrel giving a ready supply of clean rain water. Remember to fit a cover over the rain barrel and a mesh net in the gutter down spout to prevent leaves and unwanted debris from collecting in the barrel.

Storage of Ancilliary needs

Basically the fish house is constructed to house tanks and, subsequently, fish. Generally little space is left for storage of show tanks, extra filters, books, magazines, buckets and other associated equipment. This is ideal and really to achieve maximum use of space any non-essential equipment should be stored away from the needed space in the fish house. Later in the series I will fully detail a type of fish house with work room attached that offers considerable advantages over a fish house alone. One storage item worthy of inclusion in your plans for a fish house comes under the heading of live foods. A dark warm location under the bottom shelf of tanks is ideal for storage of white worm cultures, a sunny window shelf for the storage and incubation of *infusoria* or micro eel cultures and a space alongside your tanks for the hatching and storing of brine shrimp; all these should be allowed for in your plans to maximise utilization of the fish house. Finally, although not strictly a storage item, it really is an essential to make allowances for a quarantine tank or hospitalisation set up such that newly acquired purchases can be observed prior to including them with existing stock or for housing a sick fish undergoing treatment such that the infection will not spread to healthy stock. Incidentally, it is not a good idea to maintain a medicine chest of cures actually in the heated fish house since most commercial preparations deteriorate more rapidly in the light and heat characteristic of the fish house.

A typical example of a Fish House constructed from a commercially available garden shed. Note the rain barrels placed under the downspout as a soft water collection system. This particular Fish House was located in Bristol and was owned by Bob Lawrence. Bob has since moved to larger quarters and built a brick construction attached to his garage.

Ventilation

In the enthusiasm to add ample insulation and to prevent costly draughts from stealing heated air from the fish house we often forget that there will be seasons of the year when the fish house will become oppressively hot and almost impossible to work in. It is at these times when our thoughts turn to ventilation. Again the ideal situation is to install a wall mounted "Xpelair" type fan during the course of construction of the fish house. This can be manually operated at will and will rapidly make the fish house atmosphere less humid and more endearing to work in as forced ventilation takes effect. The alternatives

are merely to open the fish house door which often has little effect unless a cross current draught can be created by opening a window also. In a cellar type construction a fan is really the only choice for effective ventilation.

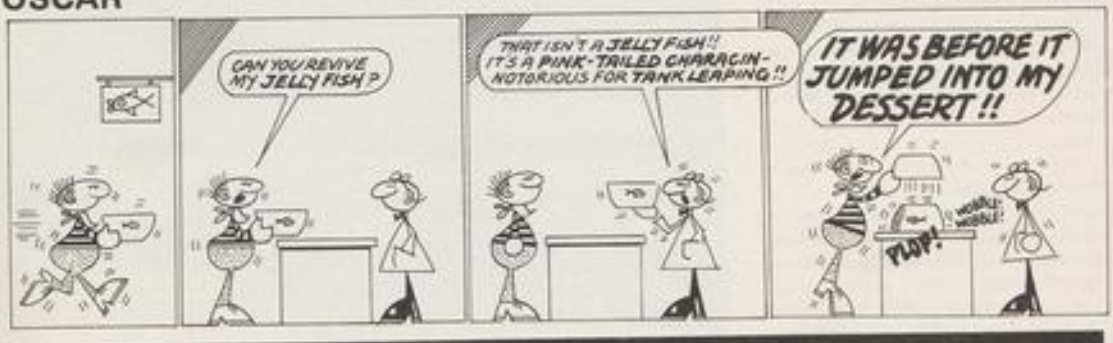
Shelving Construction

Basically the rule for shelving used to house tanks is that it must be robust, rigid and capable of supporting up to a ton of water. Each cubic foot of water maintained in a tank requires a shelf capable of supporting 62·5 lbs (approximately 28 kg). Thus a typical 5 foot by 18 inch by 15 inch tank will hold close to 600 pounds of water and four of these tanks on one rack of tanks will hold 1 ton of water. Two basic methods for tank shelving are used in practice. The first and finest method is to embed 1½ in. angle iron into brick or block walls if this is used as the inner shell for the fish house. This requires careful planning together with a knowledge of welding such that vertical support members can be added to the horizontal cross pieces. Alternatively a free standing metal framework can be constructed again if the necessary welding skills are available. A point to note of course in using metal is that it must be well painted to resist the humidity and heat in the fish house. Nothing looks worse, in my opinion, than rows of neat tanks all standing on metal shelving that is red with rust and corroding.

The second and most popular shelving material is, of course, wood. All the shelves I have ever made have been made using wood and I have never yet had a shelf collapse or sag under the weight of my tanks. Generally I have used 4 in. × 2 in. timber for the shelf uprights with 3 in. × 2 in. timber for the horizontal and cross members. Here the cost can become exhorbitant and it becomes time for the aquarist to exercise buying discretion and look to the Yellow Pages for sources of recovered timber. Recovered or salvage timber is excellent value since it is often weathered, if you buy it straight it stays straight and will not warp as it dries out as does green wood and many sizes are half the price of new lumber. I can still vividly recall my first visit to a scrap lumber yard behind the Sphinx Nest tavern in Huddersfield, Yorkshire. The owner was most helpful, spending the best part of an hour helping me choose lengths of timber for my fish house shelves, ceiling joists and wall studs and then ripping them down to size be it 6 in. × 2 in., 4 in. × 2 in. or 3 in. × 2 in. Finally in constructing the shelves I purchased some used packing cases from a local manufacturer of aluminium window frames. These consisted mainly of 6 in. × 1 in. rough sawn timber which easily pulled apart to be used as cross supports for my shelves. As a final comment on shelving remember that no matter how careful you are in constructing the shelves there may be an odd nail head that has not been punched below the surface or a ridge in the timber—placing a glass tank on these then filling the tank with water will result in a minor catastrophe. To guard against this place a sheet of ¼ in. thick polystyrene on the shelf and rest the tank on this. Any minor imperfections will then be taken up by this layer of compressible material. My choice for this duty was the insulation liners found inside fish boxes shipped to local retailers.

I feel this completes the checklist which is by no means comprehensive but which at least stimulates the imagination and provides an insight into fish houses. Next month I shall begin construction so to speak by detailing the erection of a fish house out of brick using the home wall as the fourth wall.

OSCAR **G. Robinson**



An East African Cichlid

The male bearing his normal coloration

by Frantisek Csefay

photos by R. Zukal

Pseudotropheus fuscus

PROBABLY very few aquarists and breeders would associate with the name cichlids (in addition to their being large, robust fish species) the presence of crystal clear water.

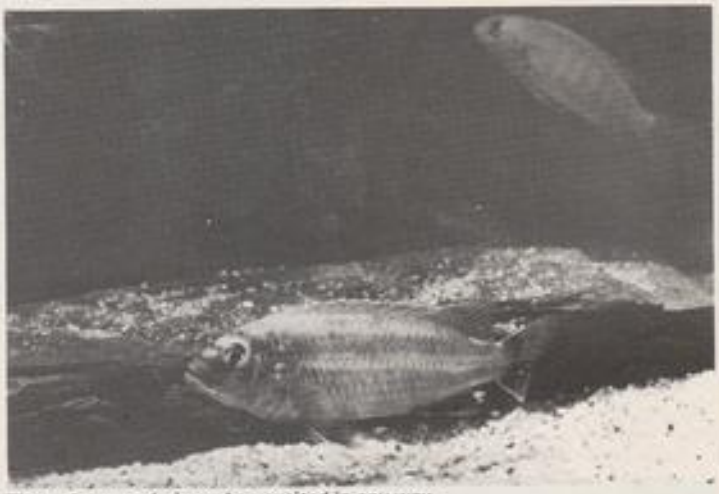
It is a long-established tradition that the idea of keeping cichlids in clean water is impossible if not absurd. They excavate, the water has a high nitrate content, they need a large amount of live food and so on. Basically each of us has such 'experience' firmly lodged in our consciousness; especially those who have had anything to do with cichlids find it all the more difficult to deny these conclusions. However, one has only to follow these pointers:

1. An effective filter, ideally with a separate drive unit, such as an Eheim filter.
2. Regular water changes (at least a third of the water each week).
3. The tank should contain suitable plants (ones with tough leaves which are not easily detached) and receive enough light.
4. A varied diet (live food, dried food and algae) especially for fish from the lakes of East Africa.

By observing the above points, in keeping not only the species *Pseudotropheus fuscus*, but all the cichlids from the East African lakes, the aquarist will receive quite a different view of the whole family of cichlids. This should also be the case, of course, with South American cichlids, with the exception of food as they prefer more live food. Here too, however, there are exceptions and these include species which will readily accept dried food. However, this is by the way.

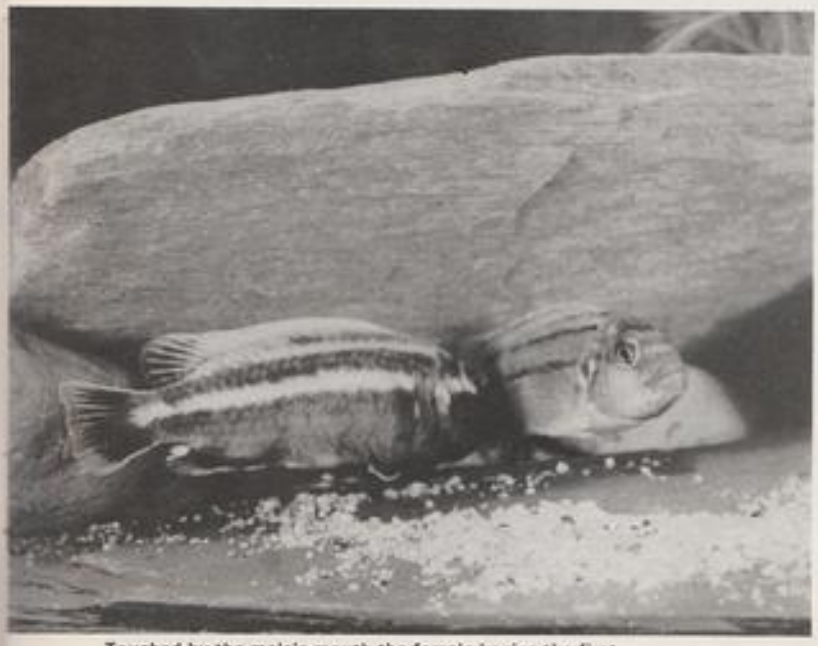
Cichlids remain, somehow, on the fringes of the aquarist hobby. They are avoided by dealers and so hardly seen in aquarist shops. And without justification. In the German Democratic Republic cichlids constitute half of the range of species on offer. As far as coloration is concerned many cichlids compare favourably with the egg-laying toothcarps and as far as parental care for the young is concerned, they are without equals.

Even the opinion that the breeding of cichlids poses no problems is not correct, for only the cichlid breeder knows how many problems there are in the reproduction of many cichlids,



The male turns darker when excited in any way

The excited male over the spawning site



Touched by the male's mouth the female begins the first attempt at spawning

such as those of the genera Crenicara, Nannochromis, Steatocranus, Cyphotilapia, Uaru, Tropheus and others.

The species *Pseudotropheus fuscus* is a mouthbreeder like all species of the genus Pseudotropheus. The fish attain a size of 7-10 cm. Apart from his splendid coloration the male is also a lively fish and he defends his territory against all-comers, particularly against one of his fellow males.

His coloration resembles that of the related species *Melanochromis pulcher*, with the difference that the sides and underparts of an adult male are a strong dark blue; a light blue band ends at the root of the tail and thus contrasts with the darker blue. This contrast provided by the light-blue band is repeated just below the dorsal fin, ending inside the rear part of the fin. On the anal fin the male has a distinctive, yellow spot, together with three, or sometimes two, smaller ones. The females have a light-brown underside, again a horizontal band which is blackish in colour, with light-brown body-sides. Both sexes have a characteristic, vivid spot on the gill covers.

Spawning takes place inside the male's territory, with the female being enticed there by the trembling movement of the male. The spawning follows the pattern of other mouthbreeders. The pair will also spawn in a community tank, but then spawning will inevitably be interrupted at intervals whenever the male has to drive away an intruding fish. The female stays on the spot and awaits the next 'round' of spawning, for he fish turn in circles around each other during spawning. This takes place in a hollow in the sand or over a stony substrate. As soon as the female has extruded her eggs spawning is terminated.

Since the male, predominantly, digs with enthusiasm and excavates hollows in the sand with the result that within a short period of time largish quantities of sand are moved from one place to another, I would recommend the use of coarse, pea-sized gravel which has been well washed. I would avoid a 'normal' sand bottom. The purposely created cavities between stones should be arranged on something other than sand in order that the male's digging cannot undermine them and cause them

The male extends his anal fin towards the female and so the milt enters her mouth

to collapse. To prevent the glass bottom from being damaged I place a thin sheet of polystyrene beneath the larger stones. The number of young is not particularly big, between 10 and 25. The eggs are carried for 17-21 days in the female's mouth, depending on the water temperature. The number of young is dependent not only on the size of the parents but also on the quality of their food. The basic diet should consist of the meat of warm-blooded animals (liver, heart, ordinary meat), flake food, Tetra or Sponda, Cyclops, mosquito larvae and also *Tubifex*.

As soon as the female is carrying the eggs she should be moved to a smaller tank where there is peace and quiet and the young can be 'incubated' without disturbance. In this rearing tank, drinking water which has been left to stand is used, or half of the water from the community tank. Good aeration is important. For as soon as the female suffers from a lack of oxygen she will spit out the eggs and swim to the water surface in order to gulp in air. Unfertilised eggs are also spat out from the female's mouth. This is recognised by the milky clouding of the water. These occurrences have formed part of my recent experience with *P. fuscus*. Imperfect fertilisation takes place when the male is disturbed by other fish during spawning. He then interrupts the spawning activity and repeatedly drives them away. Consequently, it is better if the pair are kept alone or with only a few other fish. The male of *Pseudotropheus fuscus* defends his territory diligently, with the result that the number of young is slightly higher in relation to other Pseudotropheus species. In the case of *P. lombardoi*, for example, the male is less active. I have observed a female of *P. microstomus* swim up serenely and pick up the eggs. The young are not demanding as far as diet is concerned. They will accept almost any fine live food, even chopped *Tubifex* after a week, and even shredded cow's heart after a month. In order to vary the diet Tetra food which has been rubbed between the fingers can be offered. They grow relatively quickly and are three to four centimetres in size after six to eight weeks.

I consider that two males in a tank are quite sufficient, for a larger number would lead to fighting and they would devote more time to the defence of their territories than to the females.

Already stimulated, the female begins to deposit the eggs

PRESS RELEASE

New undertank Aquarium Heater

A new heater for tanks of tropical freshwater and marine fish which has several significant advantages over conventional heaters is to be available from retailers next February.

The Swimmers Undertank Heater is the first product from Swimmers Ltd., a new company formed to develop "high-technology" products for the fishkeeping hobby. Electronic thermostats and alarm units will also be available from the company early next year.

Test marketed last November, the Swimmers Undertank Heater is designed to fit *under* the aquarium to be heated. Particularly suitable for two-foot tanks, the heater can also be used with larger aquariums. With an output of 125W, the 24 in. × 12 in. heater is only approximately ¼ in. thick and is therefore virtually invisible in use. This is its major advantage over conventional glass tube heaters and combined heater thermostats.

Apart from the obvious safety benefits of removing the heat source from the water, thus negating the possibility of fish burns or electric shocks, the Swimmers Undertank Heater is effective in maintaining the required temperature *throughout* the aquarium, not just in one area, which is one failing of conventional heaters.

Mr Nicholas Harvey with the new Swimmers Undertank Heater

By preventing hot spots or cold layers of water, the Undertank Heater keeps delicate fish in greater comfort and with no risk of thermal shock occurring. Any type of thermostat can be used to regulate the heat of the water, although the heater manufacturer recommends the use of an external, electronic type for most accurate temperature control.

Mr. Nicholas Harvey, Managing Director of Swimmers Ltd., believes the company's new Undertank Heater is ideal for display aquaria, plus breeding tanks where conventional heaters can make it difficult to net young fish. "The use of undertank heaters will become widespread as fishkeepers become increasingly dissatisfied with the appearance of conventional heaters and their limitations," claims Mr. Harvey.

The Swimmers Undertank Heater should be generally available from retailers in February/March 1983. In case of difficulty it can be ordered direct from Swimmers Ltd., 197 King's Cross Road, London WC1X 9DB. Recommended retail price of the new heater will be £11·95, including VAT.

New Foodsticks from Tetra

Another totally new idea from Tetra—foodsticks for fish, reptiles and amphibians. Many hobbyists will be aware that when large fish are fed conventional flaked or pelleted foods, small fragments of the food inevitably remain uneaten in the aquarium or pond. This is not only wasteful but poses a potential pollution threat. Floating pond pellets have, to some extent, overcome these problems but their nutritional content is often low. Therefore, the range of high quality prepared foods available for larger fish such as cichlids, certain barbs and sharks, some marine fish and turtles and aquatic frogs has, until now, been rather limited.

Following research at the Tetra Laboratories, along with trials at West Aquarium (Europe's largest breeder of ornamental fish), the idea of foodsticks was developed. These foodsticks are made by a special process called "extrusion," which results in their characteristic 1-2 cm long appearance. When added to a pond or aquarium they quickly absorb water, taking on the appearance of earthworms (a favourite food of many larger fish). Small fish may then nibble at the foodsticks and larger fish may swallow them whole. The result is very little waste and a healthy balanced diet!

It is important to stress that these foodsticks are highly nutritious and may be used to form a staple diet of fish, reptiles and amphibians.

The new foods are:

Tetrapond DoroFin Foodsticks for pond fish—available in 100gm sealed drums.

DoroMin Foodsticks for large aquarium fish—available in 170gm, 340gm, and economy 1,010gm sealed drums.

ReptoMin Foodsticks for terrapins, aquatic frogs and newts—available in 30gm and 150gm sealed drums.

For further information, contact your local Tetra stockist, who may obtain these foods from his Tetra wholesaler or the Tetra Information Centre, 15 Newlay Lane Place, Leeds LS13 2BB.

Recommended selling prices:

TetraPond DoroFin Foodsticks:	
100gm	£1·99
DoroMin Foodsticks:	
170gm	£3·10
340gm	£5·20
1,010gm	£13·60
ReptoMin Foodsticks:	
30gm	£1·15
150gm	£4·20

Press enquiries: Christine Warwick Eastleigh (0703) 619791.

BREEDING TILAPIA BUTTIKOFERI

by
Barbara P. Mayers

Photo by
Dr. R. W. Ingle

WILD caught newcomers to our breeding houses always arouse curiosity and interest; in September 1980 when ten 1½ to 2 in. *Tilapia buttikoferi* arrived we were delighted to receive these much sought after fish. They were caught by Mr. D. Desborough in Sierra Leone and were given to us to breed by Mr. Neil Hardy.

As is customary whenever we receive fish we are unfamiliar with, we searched through our books and old magazines for information and found only two references to this fish—T.F.H looseleaf no. F 586.16 and Aquarium Digest International No. 6 1973 with a superb photograph and short article by Mr. E. Roloff, the talented German aquarist, wherein he states he spawned a pair, but gave no further detailed information. What we did learn was that this cichlid attains a size up to 10 in. and are "decidedly aggressive". Clearly we had a long way to go before our small fish would be ready to spawn. We set them up in water with a low pH, temperature around 78° and fed them twice daily with live food and a protein-rich food we prepare ourselves—and waited a year! By this time the fish had more than tripled in size and were looking very impressive.

Naturally during this period, as they grew, we moved them into larger tanks and, as juvenile playfulness turned to aggressive behaviour, we furnished the tanks, with an assortment of broken clay pots to form retreats and floated several 6 in. lengths of 4 in. diameter hose—the smaller fish find these particularly useful when escaping the tank bully.

The fish were constantly watched and moved from tank to tank until towards the end of the year they were housed in 60 gallon tanks bare except for two large clay pots placed horizontally, two fish to a tank; all glass dividers were used whenever their behaviour warranted such a measure. It was their behavioural traits at this stage in their development which enabled us to determine their sex—externally they looked very much alike.

Our first spawning occurred at the end of September 1981; the female's blunt ovipositor tube was visible seven days prior to spawning—the male's pointed tube ap-

peared two days before spawning. Spawning took place inside a large clay pot and was infertile Two weeks later another pair spawned with the same result We deduced that either the males were late developers or our selected pair's reproductive cycles were not in tune Six spawnings later, with just a few fry to show for our efforts, we had three proven pairs—by now the males were 8/9 in. mature handsome fish.

After hours of close observation of the behavioural pattern of these aggressive fish we were convinced that the success or failure to produce fry in quantity rested as much with us as with the fish, it was simply an awareness—instinct if you wish—to know at what point courtship through the glass partition has reached the point where bodily contact is vital to bring both partners to the point where their reproductive cycles harmonize and a fertile spawning results.

We have had four successful spawnings averaging 600 fry. Each time the spawning occurred inside the clay pot which was removed and hatched in a clinically clean tank. The fry hatch in 3 days and are free swimming 7/8 days. The fry are fed micro worms and freshly hatched *Artemia* nauplii initially, graduating to fine *daphnia;* fry growth is rapid with proper feeding and frequent partial water changes.

It has been most gratifying working with this cichlid which has caught the imagination not only of aquarists in this country but our fish have travelled as far afield as Japan. Aquarists who read Mr Desborough's interesting account of his field trip to Sierra Leone—Aquarist April 1981—may recall he caught at the same time 35 *T. joka;* eight of these fish were given to us and these also have been successfully bred, the details will form the subject of a subsequent article.

by
Roy Pinks

AQUARIUM KEEPING, like many other hobbies, is a happy hunting ground for manufacturers and users of every imaginable sort of gadget. Many are a complete waste of money, a largish number are just about worthwhile, and a mere handful are indispensable. I often wonder how readers would vote on the composition of the latter category, which would largely comprise the first purchases after the tank and its immediate furnishings of gravel and plants. Certainly, the covering is the prime consideration as most fish will leap from the water from time to time, and something is needed to prevent their finishing up on the carpet. Integral cover and lighting units are therefore an excellent investment, and these should incorporate a removable panel of some sort to allow access of both your hands in order that you may feed the fish and carry out routine servicing of the tank. If you are hard up you can make a cover from two sheets of window glass of equal size. The front half is the one which permits feeding and the rearmost stays put, supporting whatever lighting equipment you have provided. Again, some light boxes are available commercially, but it is quite simple to construct a container using hardboard and scraps of softwood, and to hang from its roof the light fitting itself. Today most aquarists use fluorescent lighting, and the complete units are extremely easy to install in your home-made housing. The cover and the lighting, therefore, keep your fish where they belong and provide illumination for plant growth without which the tank will not only look uninteresting, but will prevent the fish from giving of their best.

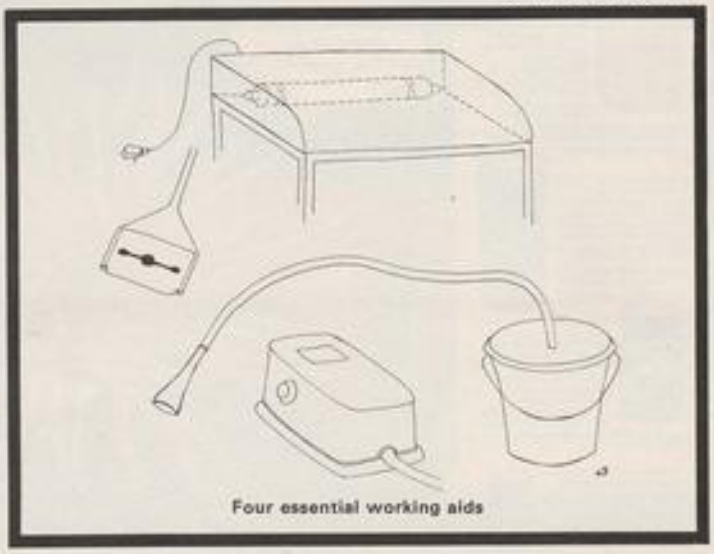
Aerator

Almost certainly the next most important item of equipment is an aerator. I think this is pretty much taken for granted today, but it is not always clear to the aquarist quite why it is so valuable. It is certainly not an oxygenator, as some will have it, but it does go a long way to ensuring that the available quantities of oxygen are put to the best purpose. This is achieved by causing a circulation or agitation of the water in such a way that the surface is always in motion: this makes it easier for carbon dioxide to escape into the atmosphere and for oxygen to be taken into the water for the benefit of the fish and plants. For most readers this is a fairly vague concept which has to be taken on trust as the process is quite invisible. However, a clearer appreciation will be possible if you set up a tank and leave it without an aerator, or if you switch off your own aerator for a day or so. What is most likely to happen is that a dusty scum will gradually build up on the water surface, and in some cases this is tangible enough to prevent fine fish food from sinking to the bottom of the tank. This seal effectively slows down the rate at which the carbon dioxide can get away, and it discourages the good work done by the bacteria which can only function in the presence of enough oxygen. This in turn encourages the ascendancy of bacteria which flourish in the absence of much air, and the consequence is that stagnant smell which has caused the premature downfall of all too many beginners' aquaria.

Scum disposal

The type of scum I have described often forms on the water surface in newly set up aquaria, and it should be removed regularly until the aerator and other factors have combined to defeat it. The way to dispose of it is to cut out several pieces of newspaper exactly the size of the water surface, and to lay the first piece flat on it, and then to draw it gently upwards and to the right. This

Continued on page 39



Four essential working aids

AMERICAN SUNFISHES

by Dr. R. J. Goldstein

LEAFING through aquarium hobby textbooks, one is struck by the different treatments accorded the family Centrarchidae by American and European authors. While Innes, in his *Exotic Aquarium Fishes*, described the pygmy sunfishes of the genus *Elassoma* (twelfth edition), and Morgan described not one species in *Tropical Fishes and Home Aquaria*, Sterba's *Freshwater Fishes of the World* made a reasonable attempt to cover as many of the species as were known at the time the book was written. Only seven species were included in Axelrod and Schultz's *Handbook of Tropical Aquarium Fishes*, but that text was not meant to be a compendium so much as an introduction. Subsequent books and editions of many aquarium works have expanded on their treatment of this interesting family, but none has yet provided a comprehensive and comparative overview of the group, with sensible recommendations for the care of these beauties. Instead, book treatments have tended to be influenced by past publication and the availability of quality photography. That is equivalent to covering an election campaign based on photos and biographies in hand!

The family Centrarchidae deserves better than that. Today, it contains 32 species, many of them known to sportsmen, some to aquarists, and a considerable number unknown to any layman. The principal divisions of the family are the black basses (six species of *Micropterus*), the crappies (two species of *Pomoxis*), the sunfish-like basses (*Acantharchis, Ambloplites, Archoplites* and *Centrarchus*), the pygmy sunfishes (three kinds of *Elassoma*), the spotted sunfishes (three species of *Enneacanthus*) and the true sunfishes (eleven kinds of *Lepomis*). All of them occur in freshwaters, and most of them occur in the eastern part of the United States, ranging into Canada or Mexico.

Perhaps the difficulty in identifying many of the sunfishes accounts for the lack of solid information on caring for them. Indeed, the best way to identify these fishes is from regional fishery textbooks that cover the locales from which these fishes have been collected. For example, the bluegill (*Lepomis macrochirus*) ranges over much of the U.S., and in its various habitats (freshwater streams in the mountains all the way to brackish coastal waters), it varies extraordinarily in colours, maximum size, body shape (especially development of a heavy shoulder region), and similarity to other sunfishes with more restricted, but overlapping, ranges. Many of the sunfishes positively alter their overall body colours according to the habitat, and one must rely on details of gill cover shape and colour edging as well as more complex anatomical features for making identifications. American fisheries scientists don't have this problem, since they are concerned with identifying fishes from known, restricted geographic regions. They know that their specimens were taken from, for example, grassy shorelines of Lake Erie during the spawning season or a sinkhole in the northern regions of inland Florida in winter. All this supplementary information is used to say that fish A is this species, rather than that one, and fish B can be separated from fish A by such-and-such a character *in this location*.

As aquarists, we want to know which fish we have but, more importantly, we want to know how to care for it in order to induce breeding. We thus rely on habitat information and pay less attention to the correct species identification. And that is as it should be. For what's in a name? And what kind

***Enneacanthus obesus* occurs in darkly stained water of the middle Atlantic coast of the United States, and shares its habitat with another, more colourful relative**

of aquarist knows the names of fishes but not how to care for them?

My own experience with sunfishes ranges from Maine to Florida along the eastern coast of the United States, and with collections made in many other locations well inland. I have frequently been frustrated when trying to identify a Florida fish from a New York handbook, and don't advise using any but the most pertinent literature. My photographs of freshly caught specimens often show colours not mentioned in any of the books, and fishes which have proved in the laboratory to be the same species have also appeared in nature to be dramatically different.

These colours are often a clue to the habitat from which the fish were taken. For example, a whitish basic body colour is indicative of a sandy bottom stream bed, perhaps interspersed with rocks. A dark body colour, ranging from brown to purple, indicates a dark-stained lake. Sharply etched black markings on a pale body indicates either immaturity or fright, and should not provide a clue to habitat. Why bother with habitat information if the fish has a broad habitat range? Early experiences and recent residence of the fish will determine those conditions to which the fish will quickly adapt. And often, if the fish cannot be quickly adapted, it will weaken to the point where even the most appropriate aquarium will not provide sufficient stimulation for a recovery to full health.

Several errors of aquarium management are the predominant reasons why aquarists fail to breed centrarchids. Let us look at them one at a time. Many, of course, apply to certain species but not others.

Error 1. Using a community tank. When new and exotic killifishes or gouramis are imported into the United States, American aquarists don't even consider treat-

Lepomis gibbosus the pumpkinseed, is a more northerly species of sunfish that only occasionally develops these intense colours. Photo courtesy of the North American Native Fishes Association

A longear sunfish, *Lepomis megalotis*, collected in Alabama by Fritz Rohde

Fritz Rohde collected this spotted sunfish, *Lepomis punctatus*, in North Carolina

Enneacanthus gloriosus is thought to be more delicate than its duller relative, both can be equally hardy under good conditions

ing them in any way but with their own private tanks. Why risk failure to breed or attack from other fishes? For some reason, centrarchids are seldom given the same consideration. Perhaps their generally large size causes the aquarist to suppose that the fish can take care of itself in a scrap. That's all wrong. Size has little to do with aggressiveness and success in combat. It is the territory holder that will be aggressive, the newcomer that lives in fear, and a little fish can take a big bite. Even small bites can become infected, especially in a stressed fish, and cause debilitation and death.

Error 2. Using a tank too small or without shelter. We often want to see how are fish are doing in their new homes. However, if we can see them freely, they must feel terribly exposed and insecure. That may be allowable with an adapted fish, but newly acquired wild fish should not be treated in that manner. They will fade, dash about, feed poorly, and probably damage themselves with neglect, stress secretions and wounds

Error 3. Using the wrong food. Centrarchids are not cichlids. They should not be started on cichlid flakes or pellets. Most of them do not eat fish, but only insects, snails and worms. *Elassoma,* for example, should have a diet of live foods, including live baby pond snails. With a diet of *Daphnia, Tubifex,* small mosquito larvae, and baby *Artemis* to supplement the baby snails provided by a heavy population of snails in the breeding aquarium, the parent fish will protect their eggs and not eat their fry. That old shibboleth about keeping snails out of breeding aquaria just does not apply to this fish, and can inhibit success. *Pomoxis,* on the other hand, should be fed occasional minnows, up to half or three fourths of its diet, although not less than a fourth. *Lepomis* get no fish at all.

Error 4. Keeping the wrong centrarchid species. Just as there are certain *Tilapia* among the cichlids that nobody wants, there are certain centrarchids not worth keeping or too troublesome for the pleasure they provide. Others are just too difficult to keep in good health (*Centrarchus*) and colour, and I would advise using that space and effort for something that is a realistic challenge, rather than a foregone failure. Among the centrarchids I advise against are fliers (*Centrarchus*) and all the black basses (*Micropterus*), as they get too large. *Pomoxis* are quite pretty in nature, but require extraordinary amounts of space and exceptional water quality, a combination few of us can provide without interruption.

Error 5. Failing to read appropriate literature. There is no substitute for scientific fisheries books. For fish caught in one state, there will be a description of the water bodies it occupies, reviews of breeding months and locations in the habitats (microhabitats), time of day of spawning, reviews of stomach contents studies, descriptions of the eggs or nests, and a host of other leads to relevant literature. Armed with solid facts about how the specific fish live in the specific region, the aquarist can attempt duplication of the conditions with enhancement of stimuli that might induce spawning.

Error 6. Not failing to read aquarium literature. Much of the material in aquarium texts is old, erroneous, supposition. For example, it has been written that all centrarchids much go through a period of cold exposure in order to make their gonads mature for the next spawning season. That's just not true. While overwintering is good for many centrarchids, it is an old tool among commercial breeders for all kinds of fishes. If you drop the temperature and photoperiod along with food supplies, and then bring both up gradually, the fish will often come into breeding condition. However, it's not generally necessary to go through these procedures so much as it is reliable and a good way to get all your fish timed for simultaneous spawning. It makes for an efficient breeding operation.

Error 7. Ignoring the fish. It is easy to allow an aquarium of large fish to become overgrown with vegetation, loaded with detritus, or stale from lack of water changes. The results are as predictably disastrous with these vigorous looking centrarchids as with less robust fish. It is poor management and you will take losses.

Error 8. Failing to discard sick fish. This can be one of the worst errors of the group. Many native fishes will be carriers of parasitic protozoans in their muscle tissues or intestines, and under stress some of these parasites will overwhelm the host and cause severely debilitating diseases. Such fish should be discarded or isolated at once. When one of these diseases appears in your aquaria, it is often at epidemic proportions and nothing you do will save the severely afflicted specimens. Instead, by keeping those fish around, you are maintaining a nursery for the germs, a living culture system that is feeding into your fish room, into water droplets, on nets, on your hands, and sometimes with splashes of thrashing fish.

I have a treatment that usually works on all kinds of diseases. It's called the Deep Six Medicine. While I lose the sick fish, it is remarkable how quickly epidemics come to a halt. I also grow nice tomatoes in my garden.

COMMENTARY

Continued from page 34

is then disposed of and the other pieces are in turn treated likewise until the water surface is sparkling clear.

The next recommendation I will make is a really efficient algae scraper, but as I have yet to meet up with one commercially I can only suggest that you experiment with a contrivance similar to that in the sketch. The trouble with most commercial products is that they are not robust enough, they do not handle well, and they are rarely long enough to get to all the vital places in the larger tanks. Quite apart from keeping the glass in aquaria clear enough for you to enjoy the contents, the periodic scraping away of the algae is often cause for great delight on the part of the fish, which seem to appreciate it as an extra food item. A pity they do not remove it at source, as this would be a chore which most of us could well do without.

My final selection would be the fish tailed dip tube connected to a length of rubber tubing, which is the finest cleaner for the floor of the tank ever invented. Though there are many types of dip tube on the market which operate manually, these only remove a small quantity of the mass of debris which exists in the average tank. Therefore a more continuously-running device is really called for, and the type I prefer also enables you to 'sweep' awkward or heavily laden areas to maximum effect. It is operated on the syphon principle, with finger and thumb on the rubber tube to regulate the flow. It will be found that this may well remove from the tank more water than you think you should lose at one sitting: a couple of inches is about right, and the deficit should be, preferably, seasoned rainwater brought to the correct temperature.

I nearly forgot. In the interests of domestic happiness you should put a bucket at the discharge end of the dip tube. And if you place a large piece of plastic sheeting underneath the bucket to protect the carpet absolutely, the ultimate reward may be quite incalculable.

Advertisement feature

Age of Aquaria

— a celebration

In October of last year, Martin and Jackie Briscoe celebrated the first anniversary of their now popular retail business situated in Potters Bar, Hertfordshire. Below, Jackie tells something of their early struggles and the progress which they have made.

My name is Jackie Briscoe and together with my husband Martin, I run an aquatic shop called 'Age of Aquaria' in Potters Bar. We opened last October after several years of studying tropical fish as a hobby. Martin has bred Siamese Fighters and written articles on his experiences in this connection. At one time we had ten tanks in our home and about thirty Siamese Fighters in varying stages of development, each in its own glass jar. All of these had to be fed and looked after individually each day, an operation which took many hours.

Martin was originally a landscape gardener both privately and for a firm of estate agents and I had a small audio typing business which I ran from home. We worked seven days a week for several years in order to start this business and, as mentioned earlier, we achieved our goal in October 1981. The first problem to come along was the winter—the worst in at least thirty years!

Throughout the dismal snowy months we gained loyal customers who came to us in spite of the arctic conditions. These customers we would now like to thank.

We made every effort to create a genuinely friendly atmosphere and are now on first name terms with most of our customers. Believe it or not, we still have enquiries, both from personal callers and over the telephone, as to whether we sell fish. We do indeed, tropical as well as coldwater and very soon it is hoped to expand the coldwater section and supplies for the outdoor pond, etc. Each week we endeavour to find 'out of the ordinary' fish to stock and we also intend to build up on our tank of killifish. One of our favourites is the Synodontis catfish a species which has many heartwarming characteristics.

Currently we have just moved our counter because people told us that it formed a 'psychological barrier' in its original position. Customers can now walk straight into our fish rooms which was, we were told, what they would prefer. So, as you can see, we do our best to please the public, offering a cup of tea or coffee if people have travelled far to see us. We are now attracting customers as far afield as Northampton and Aylesbury, but our first concern is the health of our fish and to see that they leave our shop in the best condition possible. Plants also receive special attention from Martin who, as mentioned above, was a landscape gardener before we attempted our present venture.

We very much enjoy what we are doing and feel that there aren't many people who can claim as much these days. Finally we would like to thank Mr. B. Whiteside for his many mentions in W.Y.O. and especially for his apology to Martin, printed last year, in connection with his knowledge of plants.

In conclusion I would just mention that many of our customers have had significant success in breeding Siamese Fighters after reading Martin's articles and following his advice.

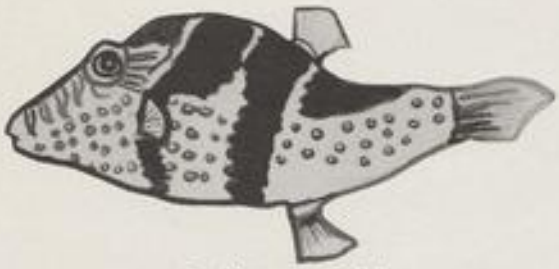
SOME PUFFERS FOR THE MARINE AQUARIUM

by
P. M. Millson

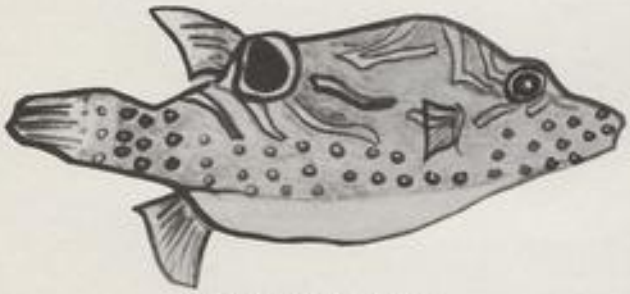
PUFFER FISH come from several closely related families. The Tetraodontidae is the largest family and all the fishes contained within it have four teeth in the jaws (hence Tetraodon), the pair in each jaw forming a parrot like beak. The family Diodontidae is a small one and includes the Porcupine fishes or Spiny Puffers. These fishes differ from the Tetraodontidae in that they have only two teeth, one to each jaw. The family Canthigasteridae contains just a single genus. This family are sometimes known as the sharp-nosed puffers because of their elongated snouts. They also have a laterally compressed body with a ridge along the back. Fishes from this family are generally quite small and colourful and for this reason they are often quite popular with marine aquarists.

Like all Puffers, fishes from the family Canthigasteridae have the ability to inflate themselves with air or water to nearly twice their normal size. They do this when they are threatened or alarmed although specimens in the aquarium sometimes briefly inflate themselves for no apparent reason, perhaps just as a check to see that the mechanism is in working order. In the wild male puffers will also inflate as a form of territorial behaviour. Fishes most commonly imported are *Canthigaster margaritatus* (Oscellated or Diamond-flecked Puffer), *C. valentini* (Minstrel or Black saddled Puffer), and *C. rostrata* (sharp nose Puffer).

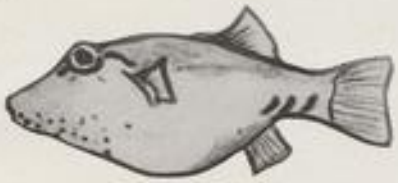
C. margaritatus grows to about 15cm in the wild. It is an Indo Pacific species of wide distribution and is very common in the Red Sea, along the Arabian coasts down East Africa and east to the East Indies and the Pacific. In reef areas it appears to be common in tide pools and over the shallow, open reef. The fish has a large black spot in the dorsal area. The body is brown or orange brown with small, white dots and the belly is white. In its natural habitat the fish eats mainly coral polyps, crustaceans and molluscs. In the aquarium it will accept most meaty foods once it has settled down. It can, however, be an aggressive little fish and should not be kept with individuals of the same species or with most invertebrates which it will eat. Nevertheless it is a hardy little fellow, resistant to most diseases and is usually available in



Canthigaster valentini



Canthigaster margaritatus



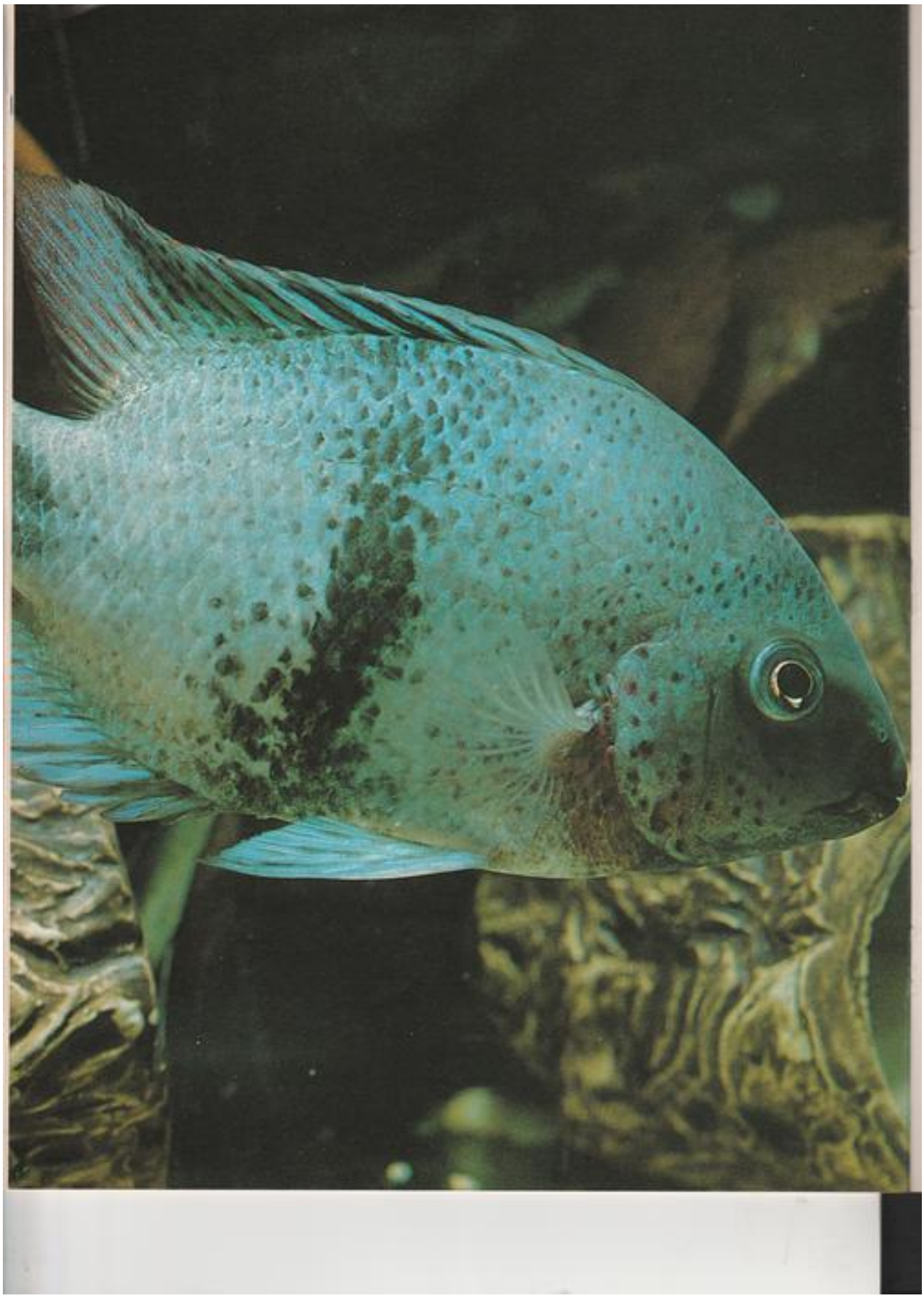
Canthigaster rostratus

the shops for not much more than an ordinary damsel. It is also well able to 'stand up' for itself on introduction to the aquarium and does not appear to be intimidated even by quite large fish.

C. valentini grows to about 20cm in the wild but not to more than about 10cm in captivity. It has a distinctive saddle like configuration of blotches and spots on its back and sides. It has been reported from the East African coast to the Indian Ocean islands and thence east to Queensland and Samoa. This fish is also often available fairly cheaply but again it can be aggressive towards its fellows. Young fish, however, appear to quite like each other's company. Like the humbug and domino damsels these puffers can also make strange grunting noises when upset.

C. rostrata grows only to about 11cm and is the smallest member of the genus. It is an Atlantic species found on both sides of the ocean. It lives in several different types of habitat but is possibly most abundant in sea grass beds. This fish has an orange back and the chin is covered with small, blue dots. Blue lines radiate from the eye and run along the tail and a set of vertical blue lines appear on the lower tail. The fishes' natural diet appears to be sponges, crustaceans, sea urchins and algae.

All the fish mentioned settle down well to life in the aquarium, although some care must be taken when selecting tank mates. Puffers seem to enjoy a nibble at long fins and once established in an aquarium they may viciously attack any newcomers. They cannot be kept with invertebrates, sessile invertebrates like coral and tube worms being particularly at risk. However, I did keep *C. margaritatus* with a large starfish and a small hermit carab and it did not trouble either of them, possibly because it was too well fed. On the whole these puffers seems to be somewhat solitary creatures, lurking amongst the rocks and coral until feeding time. They soon become tame, however, and will readily take food from their owner's fingers. This, and the fact that they are small, colourful, cheap and hardy make them quite desirable little fish to own.



SPOTLIGHT

The Black-belt CICHLID

by Ian C. Sellick

Cichlasoma maculicauda

AN attractive, unusually coloured fish that has recently made its introduction to this country is the black-belt cichlid, *C. maculicauda*. Although sometimes a little difficult to acclimatise to the aquarium environment, this species is, I think, destined to become a firm favourite among those who like their cichlids big, but not too nasty.

Small juvenile *C. maculicauda* are generally brownish overall with a large black blotch on the caudal peduncle, hence the specific epithet. Seen like this they are singularly unattractive, and being somewhat expensive, do not appear to be a good proposition to the aquarist. But what a change as the fish grows. Initially the black caudal blotch starts to fade and there develops a central black band around the body, while the base coloration becomes more bluish. These changes become progressively more pronounced, with brilliant blue appearing in the fins, particularly the dorsal, anal, and pelvics and subsequently the fish, particularly males in breeding condition, develop a claret throat colour that is only matched by the reds in the dorsal, and especially the caudal fins. Males tend to be more brightly coloured, and are significantly different in body proportions, becoming deeper with a more massive head. Males will ultimately grow larger than females reaching 30cm (12 inches) in standard length.

Cichlasoma maculicauda is a fish that has a widespread distribution in Central America, being found in the lower reaches of rivers and coastal lagoons from Panama in the south to Belize and Southern Mexico in the north. This is quite an unusually large range for a Central American cichlid, most species from this part of the world have relatively restricted distributions. The reason that *C. maculicauda* has spread so far is its salt tolerance, allowing it to become distributed around the Caribbean coast, "hopping" from one river system to the next. This knowledge is of relevance to the aquarist, as it will be found that the addition of a small amount of salt to the water will be beneficial if the fish appear unhappy.

Otherwise, maintenance conditions are similar to that of the majority of other Central American *Cichlasoma* species, hard, alkaline water being preferred at a temperature anywhere between 70 and 80°F, although preferably in the middle of this range.

Naturally enough, with a fish that is going to reach over a foot in total length, a large tank must be provided with adequate filtration, and regular water changes. They are probably best kept in a mixed community of like-sized fishes with only a pair of *C. maculicauda* once they reach sexual maturity. Although well able to stick up for themselves, they do not seem to be over aggressive, except when defending a spawning site or fry. I have my fish in a tank containing *C. nicaraguense*, *C. motaguense* and *Uaru*, which on the face of it might not seem an ideal community, but seems to work well enough. The tank is decorated with a multitude of rocks and there are numerous pieces of plastic drainpipe left floating on the surface for any fish that is being bullied to seek refuge in. It has been widely reported that these fish are skittish when first introduced to the aquarium. My experience has only been with young adults at about 4-5 in. in length when introduced, and I have had no problems of this nature, this fish settling in very quickly, and feeding within a few hours of introduction. However, it is always best when introducing new fish to do so in a dimly lit environment, to re-arrange the tank to disorientate previous occupants, and to keep a very careful watch for the first few days.

Feeding presents no problems as this species is opportunistic and will eat everything and anything that comes its way, from algae to small fish. Flake, ox-heart, earthworms, processed peas, pelleted foods would be suitable in captivity.

This species is a typical substratum spawner, with sexual maturity

being reached at about 6 in. in length. An area of the tank is defended, principally by the larger male, and the fish clear a suitable rock or other hard substrate, before depositing up to 1,000 beige coloured eggs. In a tank under 4 or 5 feet in length the pair's territory will encompass the entire tank, so problems may arise with other fish at this stage, especially with a large pair. In the absence of sufficient space, the divided tank method can be used successfully with this species, where the pair are kept separated at either end of the 4 foot tank with a clear divider raised about ½ in. off a flat rock placed underneath. The female will spawn on her side of the rock, and enough sperms will make their way through the gap to fertilize a substantial proportion of the eggs. If you are present to keep an eye on this, the divider can be removed when spawning commences to allow the fish to perform more naturally.

Eggs hatch in 3 days and free swimming is attained on the 6th to 7th days. Feeding presents no problem, as the fry are reasonably large and can manage newly hatched brine shrimp, ground flake food, microworm, etc. With several hundred mouths to feed, brine shrimp will be an expensive proposition, but it is worth it for the first few days to really give the youngsters a good start. Juvenile mortality can be significantly reduced by attention to very regular, copious feedings during the first few days, along with careful attention to water quality by means of water changes, every day if possible. With these regular changes, good growth can be attained, even in a relatively small tank for such a large number of fry. Growth is quite rapid, and it is not uncommon for the young to reach 6-7 inches in a year and themselves be ready to spawn. The parents will look after the fry for 3 to 5 weeks, but "accidental" mortality may be higher. However, this is more than compensated for by the fascinating sight of a pair of these beautiful big cichlids parading their young.

Defence of the fry is performed by the larger male, with the female taking on a lesser role in defence, but taking on the task of shepherding the fry within the area dominated by the male. There have been reports of parent contacting in this species, as is common with a great many *Cichlasoma* species.

CONSERVATIVE CRITICISM

I was pleased to see the article "You and Us" in your magazine so I thought that I would forward my suggestions.

While realising that the front cover must be eye-catching for sales reasons, I find it frustrating that having seen a lovely specimen on the front cover there is little more than an acknowledgement to the photographer in the main body. Perhaps the fish on the cover could "double" as the fish that is featured in the "Spotlight," an excellent article.

The articles by your regular contributors, i.e. "Coldwater Jottings" and "Commentary" usually make good reading and are interesting throughout the year. Plant Profile is also a very good article and helps to keep my tanks decorative.

The "What is your Opinion" column makes for a good collection point for readers letters, but I feel sure that I am not alone in showing no interest in the lifespan of Woolworth Bulbs (What will he do if they go out of business?) nor the results of his 'O' level students.

The October issue of Mr. Whiteside's article refers to sunny weather in July and I am sure that the post between N. Ireland and Brentford is not so slow that a more professional outlook can be featured in the article.

The experts who answer the readers' questions always make the answers understandable for everyone and I often use this column as a reference book when I can't find the information elsewhere.

As a keen member of the local society (Haringey) I find the News from Societies columns of benefit for the society and useful for show and convention dates. Could this article be improved by the inclusion of photographs from the shows?

My suggestions for new articles in the magazine would include a Breeder's Diary; A detailed article by aquarists who record the courtship, spawning and the rearing of fry. This, I feel, could lead to more successful breeding within the hobby. My second article would be along the lines of a review of what stock is in the shops/wholesalers and how to keep the stock, thus cutting down of losses by aquarists: For example, my local dealers are now selling *Botia striata* (Pakistani Loach) and *Aequidens rivulatus* (Golden Variety) and I can find little up to date information on these fish; this, I feel, would have to be done by a regional correspondent as the stock available varies within the country.

For another article, I would endorse Mr. Mansfield's suggestion in the June and September issue for a Meet the Society article.

Another article I would like to see is an in-depth report on how to photograph fish. This could be done by either one of your own photographers or jointly with "What Camera" or "Practical Photography" magazine and would give details of lighting, tanks and camera lens.

I trust that you will find my suggestions not too critical but constructive and look forward to your magazine next month.

A. J. Dempsey, London N4 4NP.

Appointment of CONSULTANT EDITOR

John A. Dawes

We are very happy to announce the appointment of Mr. John Dawes as Consultant Editor of *The Aquarist & Pondkeeper* as from 1st January, 1983. John will be working alongside our Editor, Laurence Perkins, and our Advertisement Manager, John Young, reappraising our present activities and generating new ideas for the magazine.

Shortly after graduating with an Honours Degree in Biology and Geology from Keele University, John was made a Fellow of the Zoological Society of London and a Fellow of the Linnean Society, as well as a Member of the Institute of Biology.

After nine years in schoolteaching, he joined the University of Bath as Lecturer in Education (Biology) in January, 1976. Since then, his duties have included the training of Undergraduate and Postgraduate Science Teachers, research into the educational uses of aquatic organisms, editorial work on a number of School of Education publications as well as lecturing in Evolutionary Biology and the education of Exceptionally Able Children.

Over the years, John has written numerous articles in aquarium magazines and "learned" journals in this country and abroad. Most of these have dealt with fish and other aquatic organisms (such as Crayfish) from scientific, educational and recreational points of view. This work led to the honour of being invited to apply for Membership by the New York Academy of Sciences.

John lectures to Fish Clubs, Natural History Societies and groups of teachers and has held a number of positions in specialist aquatic societies such as the Southern Livebearers Aquatic Group (President) and the Society for International Conservation of Livebearing Fishes (Vice-Chairman).

On a broader basis, he is on the Committee of the Western Branch of the Institute of Biology and is also a Member of the British Academy of Songwriters, Composers and Authors.

We welcome John to *The Aquarist & Pondkeeper* and look forward to a long and fruitful relationship.

THIS MONTH

In the centre of this copy of *The Aquarist and Pondkeeper*, you will find the first part of our new pull-out-and-keep series of leaflets.

These leaflets have been written by Dr. Christopher Andrews, of the Tetra Information Centre, and produced in conjunction with this magazine.

"THE COMPLETE AQUARISTS' GUIDE"

Each covers a specific aspect of fishkeeping and contains a wealth of knowledge every aquarist is bound to find invaluable. There are six in all, and one will be given free each month from March. Collated together, the leaflets form the Complete Aquarists' Guide.

We launch the series this month with the cover, into which you will be able to file all six leaflets—and we feel certain you'll want to collect the full set.

Next month, we deal with Setting Up and Maintaining an Aquarium. Subsequent leaflets will cover Pondkeeping; Feeding and Live Foods; Fish Diseases and Other Pests; Water Quality and Filtration; and Coldwater Aquatics and Marines.

NEXT MONTH

PATTERNS. Dr Robert Goldstein explains why fish are marked and coloured in such variety.

Our SPOTLIGHT is focused on some **FRESHWATER SHARKS.**

PRACTICAL NOTES ON KEEPING TERRAPINS. Julian Sims offers sound advice on the care of these fascinating little creatures.

plus

YOUR SECOND FREE FOUR PAGE PULL-OUT SECTION. Don't forget there is one every month until August and these will eventually provide you with a COMPLETE AQUARISTS GUIDE

ALL THIS AND MUCH MUCH MORE

GREAT VALUE AT ONLY 75p—ORDER NEXT MONTH'S COPY NOW!

Your questions answered...

TROPICAL

Dr. C. Andrews

COLDWATER

Arthur Boarder

Tropical

losses . . .

My aquarium keeps suffering from outbreaks of disease. I have lost a lot of fish and I keep changing the water but nothing seems to help. Can you offer any advice?

Your problem is a familiar one and to begin with I suggest you have a look at a good "basic" book like "Aquariums" by A. Evans (Foyles, about £1·50) or "Tropical Fish" by B. Ward (MacDonalds Guidelines, about £1·50). These will give you some sound advice on setting-up and maintaining a tank.

The most likely causes of your problem are: overcrowding, overfeeding and too infrequent *partial* water changes. You should never totally clean a tank out, but rather remove about 25% of the water every 2-4 weeks, topping up with tap water and brought to the correct temperature with a little boiling water from a kettle.

which filter ? . . .

Much has been written about the various methods of filtration. What is so bad about undergravel filters and why are some polyfoam filters so expensive?

Undergravel filters have a lot of advantages, including the ease at which they can be installed, their cheapness and their unobtrusive nature. However, they do have some disadvantages too—these include the fact that undergravel filtration which is too vigorous may adversely affect plant growth, and undergravel filters are difficult to maintain properly and will clog with time.

You mention poly-foam cartridge filters. Some *are* more expensive than others, but this simply reflects their quality and reliability. The big advantage that the good quality polyfoam filters have over undergravel filters is that the former (because they can be rinsed under a tap) do not clog with debris and hence will carry out really effective, long-term mechanical *and* biological filtration.

brackish . . .

Can you supply me with some information on brackish water aquaria?

There is available an excellent little book entitled "Brackish Aquariums" by M. W. Gos (T.F.H. KW Series, about £1·50) which will answer most of your queries. In many ways you are setting up a marine tank, with less of the problems—and a smaller choice of fish! By the way, you will have to add about 1-2 tablespoons of marine salt to each 10 litres of water (or to achieve a specific gravity of around 1·002-1·010).

C.A.

Coldwater

fantails . . .

I want to breed some good class fantails and would like some advice on how to pick out the best youngsters for growing on. I understand that there may be many types among a spawning?

You suggest that you are going to breed fantails and have the fish in a pond with other varieties of fancy goldfish. You are unlikely to breed many good fishes under these conditions. All the fishes in the pond can breed among themselves as they are all of one species. Even if you remove eggs for hatching in safety, you will find that very few if any good fantails among them. I used to breed fantails in a garden pond, but there were no other types of goldfish among them.

You will either have to get rid of all types except the fantails to have any hope of getting true fantails from your pond fish or you will have to use another pond or large tanks. Then in the breeding season you can put your best fantails away from all other fishes and you will then be sure of getting a true type from the fry. It has been my experience that it is better to spawn the fishes in a pond and to remove the eggs to another pond or tanks for rearing. You do not have to keep the fry long before they can be sorted. The sorting is most important and there is no sense in trying to rear dozens of poor quality fishes. Fantail fry soon show which are worth keeping. The fry can be inspected when very small by examining them from above. The tail of a good fantail will show a distinct thickening at the end, and resemble an arrow head. A single tail will never develop into a double one. As the fry grow further examinations can be made. Sometimes a broad tail may appear to be joined but do not be in a hurry to discard such a fish. The division may show up after a time, and the lobes may be just close together when looked at. The young fishes can be put in a glass tank and looked at from the side. It is then possible to see if the dorsal is of the correct shape and the depth of the body will also show up well. It may take some months to sort out the very best and these

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, Brentford, Middlesex TW8 8BN. All queries must be accompanied by a S.A.E.

can receive special treatment. With warmth, say 70°F, the fish can be fed well and be large enough to breed the following year. The colour comes last and this change from bronze to gold can take some months, according to the temperature of the water. All should change within the first year.

spawning . . .

If my pond fishes spawn in the spring how shall I know when they spawn and what are the eggs like?

Once goldfish start to spawn in the pond you should be in no doubt when this happens. The male fishes chase and nudge females vigorously to encourage them to spawn. The sounds of the splashing can be heard from some distance. The eggs are laid singly, but in numbers and they adhere to water plants. They are like small beads of jelly about the size of a pin's head. If a bunch of weed is picked up the eggs will show up with a slight amber colour. They take from three and a half to six days to hatch according to the warmth of the water. At about 70°F., they can hatch in three and a half to four days.

koi pond . . .

I am making a garden pond, 8ft., by 4ft., and 18 inches deep. Will this be large enough for keeping Koi?

You could of course keep Koi of four inches long for a time but these fishes, if properly looked after can grow to over twenty inches long. It is then not a good idea to go in for Koi. The best alternative are shubunkins. These are mostly very colourful and are not likely to grow too large for your pond in several years. The pond should not hold more than 32 inches of length of fish, excluding the tail. Eight fishes of two to three inches body length will be quite enough. The London type of shubunkin is rather more hardy than the Bristol type in an outdoor pond.

club member ? . . .

I have a few fishes in a tank and would like to know if you think it is a good idea to join an aquarist club?

I consider it to be an excellent idea as it will open up a whole new world of interest in fishkeeping. You will meet many other enthusiasts and learn a great deal. You will also find that it is possible to obtain spare accessories such as surplus plants and fishes. Most clubs have a library and from this and lectures you will soon be able to gain a lot of useful information. As to exhibiting, you need not worry about this for a year or so, but gradually find out at table shows, etc., what is required. There is a club in your area and you should be able to find out all about it at your local library.

judging . . .

How does one become a judge of coldwater fishes and is there some kind of a course I can take at home on judging fishes?

It is not easy to become a judge. Some of the leading societies run occasional courses but these cannot be taken at home. It is usual for an aquarist to gain some prestige by winning at leading shows and becoming well known in the hobby. One is then often recommended to a judging course and after instruction it is usual for the applicant to accompany a qualified judge at an exhibition and judge the classes and the results are compared with those of the qualified judge who reports his findings to the committee. I take it that you are already a member of an aquarist society, but if not this must be your first step.

A.B.

Plants

falling leaves . . .

How can I avoid the leaves dying on the Cryptocoryne genus? The first tank I owned had been neglected and I should think that the water had not been changed for some period of time, and yet the *C. beckettii* had flourished and propagated. However, I prefer to change a part of the water fairly frequently, and the water would require topping up as it evaporates. The problem is that this seems to cause the leaves to fall off, though I have seen this happen without a water-change. To my observation the disease appears in some way communicable, as it spreads from plant to plant rather than affecting them all at once.

As you know, most plants are very sensitive to water changes. Cryptocorynes are very adaptable to any change in environmental conditions, and as a process of this adaptation the

plant often sheds its lower leaves. However, if the partial change of water causes a certain imbalance in the mineral content of the water, then Cryptocorynes or any other plant species will react accordingly.

I do not think that the problem affecting your Cryptocorynes is a physiological one, since the decaying of the leaves spreads from plant to plant and does not occur *en masse*. I strongly suspect that what it is, is the virus causing the Cryptocoryne Disease, which as you rightly observed is communicable. Normally, *C. affinis* is very prone to this disease, but other species will also be affected, especially those coming from Malaysia, i.e. most of the plants coming via Singapore exporters.

Under normal circumstances, a healthy Cryptocoryne will not shed its leaves after a partial water change. It will adjust its physiological growth rhythm and either slow down or speed up the growth. I have been growing many Cryptocoryne species both indoors and outdoors (in a greenhouse), and I carry out water changes regularly. I have not yet experienced the phenomena which you describe. This is why I am fairly certain that your problem is caused by a virus. If this is the case the only solution is to remove all the plants from the tank and leave it fallow for about a month, then, having sterilised your gravel and thoroughly cleansed your tank, introduce new plants. There is no cure for the virus causing the Cryptocoryne disease. I believe the disease is a species of Fusarium.

plant growth . . .

I am thinking of setting up a 24 in. × 18 in. × 12 in. fish tank with an undergravel filter plate. Please could you give me some information on how to get a good plant growth. I understand that aquarium peat should be used. Would this discolour the water? Could you tell me if there is a special type of peat for Vallis and Hygrophila. I would like to know what other plants I could buy that would grow in the same conditions?

You should ideally have your water condition at a pH of around 6·5-7·0 (i.e. slightly acid) and soft. The lighting should be kept on for at least eight hours per day. The planting medium should be fairly nutritious. The best way of providing a good medium is to have a thin layer of washed aquarium peat (there is no special type for Vallis and Hygrophila) below your normal aquarium gravel or coarse sand. The medium should be at least three inches deep.

The following is a brief selection of hardy plants which would be ideal for your tank: *Aponogeton crispus, A. undulatus, A. rigidifolius, Vallisneria spiralis, Limnophila indica, Echinodorus tenellus, E. martii, Cryptocoryne beckettii, C. nevillii, C. petchii, C. thwaitesii, C. lutea* and *walkerii* and *Rotala indica*.

V.T.

Koi

pumps . . .

After reading your reply about central-heating pumps of July 1982 and the letter by J. N. Carrington published in October, I was able to overcome some of the failings with my own set-up, but I am still dissatisfied with the output which is only about 250 gallons per hour as against the one thousand gallons claimed by the makers. The pump stands beside the pond, fitted with the valves supplied, and delivers water through a ¾ inch plastic hose to a small outside filter, with return about 2 feet above the pond surface. Any suggestions?

I agree entirely with anyone who says that pumps and pipework should be arranged to automatically expel air. An example can be taken from some domestic central heating systems which are a near-nightmare to bleed when air is trapped to prevent the flow of water. The use of water pumps is quite an involved subject not to be explained in a few words, and the main trouble is that most people think any pump will do any job in full expectation of the makers' claims without realising what can happen in practice.

On the broad subject of pumping, water output given against head in feet does not mean or necessarily include the height of suction lift. These are completely different factors to affect performance according to the design of the impeller, pump body, and the intended use of the pump for low or high head duties. There are different kinds of water pumps, designed for specific duties and it must be accepted that everything in the sytem such as pipes, bends, valves, filters, suction lift and delivery head all offer restriction to flow thereby reducing output.

This is an over-simplification of the situation and a central-heating type circulator pump is exactly as the description implies with no practical true suction lift capability and must have a flooded inlet connection.

In order to improve the water output it is essential that your pump is located lower than the pond surface level and the diameter of the pipework greatly increased. I am enclosing a copy of the graph, previously published January 1982, which gives some idea of pipe sizes in relation to the flow of water.

pollution . . .

Having already used and been satisfied with the product recommended by you to control blanketweed in the September issue, I would like more information on its general use. My problem is that my filter is too small to cope with the 4,000 gallons of water I would like to keep clear and I wonder if this product could be applied on a more or less permanent basis as a preventative against green water?

The continual use of any chemicals is definitely not recommended. Whilst occasional recourse to them in a serious situation when other methods

have failed is usual, this is very different from attempting to take short-cuts through reliance on any chemicals or drugs on a long-term basis.

The quality of water is all-important to fish kept in a closed environment, so water-keeping is as vital as fish-keeping. Because of their size, Koi make special demands and successful water management should be considered a priority.

The product referred to is a herbicide and not intended to kill every form of plant-life within a pond. By the controlled dosage of 5-10 parts per million, usually in Spring or early Summer, the bane of many pond-keepers life, namely blanket-weed can be largely eradicated without causing any problems to fish. I do hope you will consider ways of improving your present filter capacity rather than depending on any chemicals. This would be similar to humans living, or should it be existing, in a permanently polluted atmosphere. Who can fail to be aware of those problems?

H.A.

Marine

clown fry . . .

Further to my letter of the 11th August 1981, I now write and tell you that I have Tomato Clowns breeding in my community tank, this is the second batch of eggs laid. The first hatched but unfortunately my Hermit Crab had a good feed, I have now removed same.

Perhaps you could advise me of any procedures I should take with this pair, in trying to rear the fry.

Many thanks for your letter regarding your pair of Tomato Clowns. Usually when Clown fish start spawning in an aquarium, they become consistent and regular spawners so if you have not been successful with your first two or three batches please be assured that there are bound to be many more batches in the future. On a recent trip to the United States I was amazed at the number of marine aquarists now successfully breeding and rearing coral fishes. The procedures are reasonably straightforward for the rearing of the fry, but do involve some plankton culture. Although this sounds fairly complex, it is in practise extremely easy. May I suggest you obtain a copy of a marvellous new book written by Martin Moe entitled 'The Marine Aquarium Handbook from Beginner to Breeder.' The last chapter deals with the rearing of marine fish and as Mr. Moe has successfully bred and reared 26 species of fishes over the last 10 years, I am sure you will find that he is well qualified in what he writes. Furthermore, plankton cultures can be obtained along with additional advice from New Aquaculture, P.O. Box 15, Oban, TA34 4LA.

c-w marine . . .

I am thinking of starting a cold-water marine system and should be grateful if you will answer the following questions for me:

(1) Is a 36 in. × 18 in. × 18 in. tank big enough?

(2) How much light will I need?

(3) Are the materials used the same apart from the heater?

(4) If I keep filter feeders such as worms or barnacles, which is the best way I can feed them?

(5) What kind of fish and crustaceans can I keep safely?

(6) Is there a book which will help me out with any other queries. If so, where could I obtain it?

Establishing and maintaining a cold-water marine aquarium can be tremendous fun and for me, like many others, it was the start to the more exotic tropical marine fishkeeping hobby. May I suggest you obtain a good book geared to the marine tropical hobby and for that reason I would suggest Martin Moe's 'The Marine Aquarium Handbook from Beginner to Breeder.' I know that there will be a new book published here next year, specifically about starting up a coldwater marine aquarium. I know the author well and I am sure it will be ideal, but at this stage most of the coldwater marine aquarium books are extremely dated, written more than 20 years ago. Fundamentally the concepts for keeping a coldwater marine aquarium are the same as a tropical marine aquarium. The only really different criteria is that of temperature. And keeping a coldwater marine aquarium in a centrally heated home can unfortunately lead to many problems, so the first thing you will require is a cold place, either in a garden shed or conservatory. But of course the danger of such places is that they do get extremely warm during the summer. My advice to you would be to stick to animals that can be collected from rock pools as these can tolerate the greatest fluctuation in temperatures.

R.S.

Discus

specialist . . .

Having kept tropical fish for some time, only recently I noticed and seriously became interested in Discus.

Four weeks ago I bought four quite young, home reared, red discus costing £10 each. I have been very careful during these novice days and consider the fish to be very healthy as they pick and feed from the bottom of the tank.

Keeping these fish has caused an insomnia of questions, very few of which can be answered by the many local shops in London as they cater for so many fish and none seem to specialise. My main aim, of course is to breed.

Is there anywhere in London that specialises or has varieties of Discus?

Why don't you try the THE HIGHGATE AQUARIST in North London.

E.S.

by Eric Hardy

CONSERVATION of birds gains major publicity, plants perhaps second, but the progress in waterlife is little known. Despite the Tovel Valley in the north-west part of Italy's southern Alps being declared a national park in 1961, it continues to deteriorate. For years it has no longer been possible to see the reddening of Tovel Lake due to the swarming plankton, a phenomenon unique in Europe. Denmark's declining otters were recently estimated to be only 180; Italy has no more than 50 in the central and south; thus this year's 3rd international colloquy on the otter, probably at Strasbourg.

A recently published red book of endangered amphibians and reptiles in Switzerland lists three amphibians and one reptile extinct, and four more reptiles in danger of extinction despite full "protection" since 1961. Akademische Verlags, which published in 1981 "Threatened Amphibians and Reptiles in Europe", is to publish "Threatened Freshwater Fish in Europe".

Efforts are being made to tighten-up legislation in Japan, the largest importer of exotic animals after U.S.A. It's the leading importer of tropical fish, reptile-skins, shells and coral. It already protects legally three species of sea-turtle, three monitor lizards and a saltwater crocodile. Greece recently stopped construction work for three months near the island of Zakynthos, because it's the spawning ground of the loggerhead turtle, a threatened species in the Mediterranean. Last spring, the Federal German Republic closed a road in Münster between 8 p.m. and midnight to enable toads crossing it to reach their spawning ground.

The results of 1982 show that the Thames Migratory Fish Committee's 17 years work to rehabilitate Atlantic salmon in a cleaned-up Thames is at least feasible. Electrofishing surveys have shown that though survival of the 60,000 parr and smolts introduced into tributaries in each of the past four years is very variable, growth is excellent. Good numbers of smolts were migrating through the estuary. Returning fish have been leaping lower weirs, with five adults recovered dead in non-tidal waters, especially at Molesey Weir on the Thames and Zenith Weir on the Mole.

Thames Water Authority biologists have shown the recovery of several fish, etc., since the estuary became cleaner. These include sea-trout from the docks to non-tidal water above Teddington, with a female sea-trout kelt in the tributary Colne the first proof of a migratory salmonid spawning in the Thames this century. Rainbow-trout are increasing in the estuary below London Bridge and grayling have been found at Blackwall Point. Smelt are now found throughout the river; dace, perch, gudgeon and bleak are most common in the inner estuary while the downflow of freshwater often takes bleak, tench, roach, bream, goldfish and crucian carp into the lower reaches from Crossness to Greenhithe. Pike are common in the Royal Docks. Goldfish and dace have been taken at Barking, chub at Brunswick Wharf, roach, bream, crucian and common carps at West Thurrock, barbel at Richmond, tench at Dagenham, rudd at Tower Bridge and sea-horse and ruffe at Dagenham. Lamperns are still at Tilbury. In all, 27 freshwater and 76 marine fish.

Their report, in the recent journal of London Natural History Society, includes many invertebrates, from sea-spider to sea-anemones. Common *tubifex* worm tolerates up to 3·5‰ salinity and has been found down to Crossness; and *T. costata* with wider tolerance ranges to full sea-water at Cliffe, but is most abundant at Crossness. Chinese mitten-crabs are breeding from West Thurrock to Teddington, because berried females are found and they may be established in the river.

The zebra mussel, *Dreissena polymorpha*, probably orginally introduced to Britain with Russian timber, covers many wooden pilings from Tower Bridge to Erith.

The society also records 12 species of mosquito in Epping Forest, hornwort and curly water-thyme in its Hollow Pond, as well as *Potamogton obtusifolius* and *trichoides*. Water-starwort, bog-stitchwort and marsh-foxtail grass border the damp Flats by Lea Bridge Road. Frogbit is in

Continued on page 54

Coldwater Jottings

by Frank W. Orme

THE envelope was postmarked Nottingham; inside there was a letter from Mr. Fred J. Whitehead who had been reading a book entitled 'Beginners' Guide to Tropical Fish' which had been revised and enlarged by the author, Reginald Dutta, in 1975. Originally the book had cost £3·50; however, he had obtained his copy for the sum of 20 pence from a local library which, at the time, he had thought made it a good buy. In fact, he found that the book contained a number of inaccurate statements. There was one particular statement which he found highly amusing and, thinking that I would be equally amused, had copied it exactly as printed. The extract read as follows: "Incidently, sexing goldfish is not quite as automatic as people think, and many a 'breeding pair' turn out to be nothing of the sort. The theory is that the male shows white raised dots on his gill plates, and the female is fatter, especially on her left side when looked at from above and behind. The white spots are the terminals of the tubes through which the males eject the fertilising milt, and are visible only at spawning condition and readiness." Mr. Whitehead informed me that those words appeared under the heading of Pond Fish, on pages 136 and 137 of chapter 19.

Although I have not read a copy of this particular book, or indeed any of Mr. Dutta's other works, I am extremely surprised to learn that the breeding tubercles of the male goldfish are (if the extract is correctly copied) considered by Mr. Dutta to be the 'terminals through which the fertilising milt is ejected'. I can only agree with my correspondent when he writes: "I am glad that I had previously read other books on fishkeeping, and I hope that any newcomer to the hobby, who might also acquire a copy of this book, will have had the opportunity beforehand to first read books giving better advice written by more knowledgeable authors."

I am sure that there are other books which contain similar gems of inaccurate information, and it might prove amusing if these snippets of misinformation could be read by readers of this magazine. Of course, the less knowledgeable aquarist may believe some of these statements for it is reasonable to expect that the author has a good understanding of the subject. Unfortunately, this is not always so because some are written by people who, being professional journalists, will write a book—perhaps to order—without adequate knowledge when researching the subject, and this leads to mistakes being copied unknowingly. Most modern books give a short introduction to the author and the contents; this information can be a useful guide as to the value of any particular work. However, such advice is not infallible.

Then there is the person who informs an author that his facts are wrong when the information is correct. After part one of my article 'Principles of Breeding' was published in the November issue of this magazine, I received a letter from Mr. J. Ince of Newark-on-Trent. Mr. Ince wrote that he had employed Mendel's Theory for many years in the breeding of Budgerigars and had found my article very interesting. However, I was told quite categorically, I had made a mistake in saying that the male chromosomes are designated XY and those of the female XX. He was so positive that, despite my own certainty, I sought assurance from other printed works—after all I could have made a foolish mistake—and was relieved to find that I had not given my readers incorrect information.

I replied to Mr. Ince and, I hope tactfully, assured him that I had not made a mistake. To further assure Mr. Ince, I also enclosed part of an article dealing with livebearing fish, together with an extract from a book about the genetics of dog breeding. In both instances the designation of male and female chromosomes agreed with the information which I had given. I feel sure that, had I committed the error of wrongly designating the sex chromosomes, the Editor would have noticed the mistake and queried it with me before the article was published.

The use of foods containing hormones can, of course, result in an alteration in the chromosomes; males becoming XX and females XY—in other words, a change of sexual character. But under normal circumstances this is unlikely, for few aquarists are likely to feed hormones to their fish, although it is possible for some fish to undergo

Coldwater Jottings

a spontaneous sex reversal. 'A History of Fishes' by J. R. Norman (revised by P. H. Greenwood, D.Sc., of the British Museum), published in 1963, contains the following: "Occasionally, individuals are found in which both male and female organs are fully developed, this condition having been recorded in such well-known species as the Cod, Herring and Mackerel. Such individuals are abnormal, but certain species of perch-like marine fishes (Serranidae) are invariably hermaphrodite and, further, are capable of self-fertilisation. Sex reversal occurs in several Percomorph and Cyprinodont families; usually the fish starts life as a female, but protandrous species are known." (Protandrous species are hermaphrodite, and the male organs develop before the female organs, thus preventing fertilisation.) When such passages are read, one realises that Nature produces enough weird mixtures, and there seems little point in Man adding hormones to a diet just to bring about a reversal of the sex. Hopefully, my male fish will continue to carry XY chromosomes and the females will always have XX chromosomes—in that way there should be few breeding problems.

Towards the end of February, the weather may show signs of improving and, if temperatures rise sufficiently, the fish may begin to exhibit some slight activity in tanks situated in a cold fish-house. If it is intended to spawn them later, and they are sufficiently active, a little chopped earthworm can be offered to them. Make sure that the food is eaten; any uneaten food must be removed after a short time to avoid any possibility of polluting the water. It is, of course, virtually impossible to remove uneaten food from a pool, therefore I do not recommend feeding fish in the outdoor ornamental pool until the fish have become truly active, and the water much warmer than it normally is at this time of the year.

If an early spawning is required it is possible to gently increase the water temperature of the fish-house tanks, by using the usual heaters and thermostats. Gradually bring the temperature up to promote the appetite and activity of the fish until they reach spawning condition. A temperature of around 60°F (15·6°C) will assist the selected fish to reach this desired state. For spawning, the temperature can be further increased to 65°-70°F (18·2°-21·1°C), but the temperature increases should not be hurried. It is normal practice to remove the fish after they have spawned and care should be taken that they are not chilled, or subjected to a marked difference in the water temperatures—this is especially important during these early months of the year.

Although some goldfish breeders like to spawn their fish early in the season, there are many others who prefer to wait until natural temperatures are higher, and livefoods have become plentiful. There is much to be said, from the beginner's point of view, in waiting until good supplies of *Daphnia* can be obtained. It makes the problem of feeding the young a little simpler if the fry can be weaned from newly hatched Brine-shrimps onto very small *Daphnia*, the size of the *Daphnia* being graduated to keep pace with the rate of growth of the young fishes until they are large enough to accept other foods.

Space and food are, possibly, more important than an early spawning date. Given the first two essentials the young will grow to be strong well-grown fish by the end of the season—and there will have been a substantial saving in heating costs.

From a Naturalist's Notebook

Continued from page 52

Fairmead Bottom Ponds in south Essex and the water-fern, *Azolla filiculoides*, in a claypit near Stubbers. The shoreweed, *Littorella uniflora*, abounds in Black Park lake, in Bucks.

The first modification of the new Wildlife and Countryside Act was made in December's general licence for releasing rainbow trout and Japanese Pacific and Portuguese oysters and their eggs into the wild, though no other fish or shellfish, with individual licence. A symposia on reptile biology will be held at the Zoological Society, Regents Park, London, 26-27 May. Dr. M. W. Ferguson is organising it.

As marine aquarists we think of colourful coral-fish, sea-slugs and opportunities to dive among them in terms of Australia's great barrier reef, the Red Sea or the Florida coast. The rocky coast of British Columbia is surprisingly rich in such things, though less known. Strawberry sea-anemones (*Epicanis prolifera*) run riot over the terraced sea-cliffs in the clear water of Discovery Passage. The world's largest octopus, up to 45 kilograms, dwells between Vancouver Island and the Canadian mainland, with more than 350 species of fish, especially around Stubbs Island off the north and Arbutus island off the south. Here dwell quill-back rockfish (*Sebastes maliger*) and red-striped tiger-rockfish (*S. nigrocinctus*) among the cloud-sponges and magnificent growths of brick-red gorgonian coral in Jervis Inlet and Agamenon Channel, at Hornby Island in the Strait of Georgia, Plumper Rock, Port McNeill and Steep Island near Campbell River. There's a bright orange hermit-crab and the frilly Clown Nudibranch, *Triopha catilinae* and alabaster nudibranch (*Dirona albolineata*), not to mention coon-striped shrimps (*Pandalus danae*) and everywhere the well-named basket-star, *Gorgonocephalus eucnemis*.

BRITISH AQUARISTS FESTIVAL

CHAMPION OF CHAMPIONS

Competition Results

The Champion Fish 1982

1st	2nd	3rd
T. A. Cruickshank	Mr & Mrs Waterhouse	A. Stirling
Pimelodus blochi	*Cynotilapia afra*	*Synodontis waterlotti*
Hendon A. S.	Merseyside A. S.	Redcar A. S.

RESULTS OF OTHER FESTIVAL COMPETITIONS

Highest Pointed Tableaux (Harry Penhall Memorial Trophy): 1, St. Helens A.S.; 2, Bridgewater A.S.; 3, Darwen A.S.; 4, Bracknell A.S.; 5, Sheaf Valley A.S. Best Fish in Show: P. A. Moye, Basingstoke A.S. Highest Pointed Society (Furnished Aquarium): Halifax A.S. Highest Pointed Individual (Furnished Aquarium: D. Shields, Halifax A.S. Best Pair Fish (Bill Kelly Memorial Trophy): A. and S. Underwood, Bridgewater A.S. Highest Pointed Breeders Team: D. A. Gow, Darwen A.S. Best Tropical Fish (Withy Grove Press Trophy): P. A. Moye, Basingstoke A.S. Best Coldwater Fish (Belle Vue Challenge Trophy): A. and S. Underwood, Bridgewater A.S. Exhibitor with most awards (John East Memorial Challenge Trophy): P. A. Moye, Basingstoke A.S. Tropical Furnished Aquarium (Society): 1, Halifax A.S.; 2, St. Helens A.S.; 3, Darwen A.S. Coldwater Furnished Aquarium (Society): 1, Halifax A.S.; 2, Runcorn A.S.; 3, Accrington A.S. Tropical Furnished Aquarium (Individual) (Walter Smith Coronation Shield): 1, D. Shields, Halifax A.S.; 2, D. Frier, Halifax A.S.; 3, R. Swales, Halifax A.S. Coldwater Furnished Aquarium (Individual) (The Hammond Trophy): 1, D. Shields, Halifax A.S. Marine Furnished Aquarium (Individual) (Bob Tomlinson Trophy): 1, B. Leyland, St. Helens A.S.; 2, R. and J. Glass, Ashby A.S.; 3, T. Keyon, Stretford A.S. Aquascape Furnished (Aquascape Silver Cup): 1, Mr. and Mrs. Stevenson, Oldham A.S.; 2, G. Johnson, Ashby A.S. Novelty Aquascape (Society) (James Kelly Trophy): Darfield A.S. Plants (Tony Beasley Trophy): 1, A. Beasley, Bury A.S.; 2, A. Beasley, Bury A.S.; 3, D. Shields, Halifax A.S. Common Goldfish and Comets (FNAS Goldfish and Comets Trophy): 1, Mr. and Mrs. Chadwick, Oldham A.S.; 2, A. Turner, Accrington A.S.; 3, D. Foed, Bracknell A.S. Shubunkins (GSGB Silver Cup): 1, A. and E. Berry, Bridgewater A.S.; 2, F. Foote, Accrington A.S.; 3, Mr. and Mrs. Newport, Runcorn A.S. Moors and Veiltails (Walter Smith Challenge Trophy): 1, Mr. and Mrs. Colley, Oldham A.S.; 2, W. Finney, Macclesfield A.S.; 3, W. Finney, Macclesfield A.S. Fancy Goldfish Fantails, Orandas, Lionheads, 'New' Variety (The Chester Shield): 1, A. and S. Underwood, Bridgewater A.S.; 2, C. Wallbank, Accrington A.S.; 3, W. Hindle, Accrington A.S. A.O.V. Coldwater (The Derby Shield): 1, Mr. and Mrs. Blackburn, Darwen A.S.; 2, J. Showdon (York A.S.; 3, S. Lavender, Stretford A.S. A.V. Coldwater (Pairs) (The Nottingham Challenge Shield): 1, A. and S. Underwood, Bridgewater A.S.; 2, D. Milner, Darwen A.S.; 3, S. Hindle, Accrington A.S. Coldwater Breeders A.V. Single Tail (Edgar Chapman Memorial Trophy): 1, A. and E. Berry, Bridgewater A.S.; 2, D. Milner, Darwen A.S.; 3, Mr. and Mrs. Chad-

wick, Oldham A.S. Guppy: 1, P. Ford, Bracknell A.S.; 2, B. Carter, St. Helens A.S.; 3, N. Turner, Halifax A.S. Molly: 1, S. Jones, St. Helens A.S.; 2, R. Brownlow, St. Helens A.S.; 3, S. Andrews, Bracknell A.S. Platy: 1, B. Carter, St. Helens A.S.; 2, S. Jones, St. Helens A.S.; 3, B. Sharp, Bradford A.S. Swordtail: 1, A. and E. Berry, Bridgewater A.S.; 2, Mr. and Mrs. Marshall, Merseyside A.S.; 3, B. Carter, St. Helens A.S. A.O.V. Livebearer: 1, J. and K. Corbett, Merseyside A.S.; 2, G. Eatough, Sandgrounder A.S.; 3, E. and B. Callow, Bridgewater A.S. A.V. Livebearer (Pairs) (Frazer Brunner Silver Cup): 1, J. and K. Corbett, Merseyside A.S.; 2, P. A. Moye, Basingstoke A.S.; 3, M. Rimmer, Sandgrounder A.S. Rift Valley Lake Cichlids: 1, Mr. and Mrs. Cooper, Bury A.S.; 2, B. Wilson, St. Helens A.S.; 3, G. Perrett, Bracknell A.S. Dwarf Cichlids A.V.: 1, M. and L. Price, Ossett A.S.; 2, R. Slee, Pocklington A.S.; 3, J. and K. Corbett, Merseyside A.S. Large Cichlids (A.V.): 1, W. Knight, Basingstoke A.S. 2, T. Cruickshank, C.A.G.B.; 3, T. Stansfield, Ossett A.S. A.V. Cichlids (Pairs) (National Aquarist Society Cup): 1, D. Ford, Bracknell A.S.; 2, J. Lister, Ashby A.S.; 3, Mr. and Mrs. Eatough, Sandgrounders A.S. Siamese Fighters: 1, G. Johnson, Ashby A.S.; 2, I. Perrett, Bracknell A.S.; 3, M. Fawcett, York A.S. Small Anabantids: 1, P. A. Moye, Basingstoke A.S.; 2, H. Campbell, Ashby A.S.; 3, Mr. and Mrs. Hartley, Sandgrounders A.S. Large Anabantids: 1, Mr. and Mrs. Walsh, Darwen A.S.; 2, P. A. Moye, Basingstoke A.S.; 3, C. Sykes, C.A.G.B. A.V. Anabantids (Pairs) (FNAS Silver Challenge Trophy): 1, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 2, E. R. Walker, Merseyside A.S.; 3, P. Gibbins, Halifax A.S. Small Barbs: 1, P. A. Moye, Basingstoke A.S.; 2, D. Cruickshank, C.A.G.B.; 3, P. A. Moye, Basingstoke A.S. Large Barbs: 1, M. and L. Price, Ossett A.S.; 2, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 3, J. Bentham, St. Helens A.S. A.V. Barbs (Pairs) (Aquarist and Pondkeeper Silver Cup): 1, P. A. Moye, Basingstoke A.S.; 2, Mr. and Mrs. Stevenson, Oldham A.S.; 3, Mr. and Mrs. Stevenson, Oldham A.S. Small Characins: 1, G. Ford, Bracknell A.S.; 2, Mr. and Mrs. B. Walsh, Darwen A.S.; 3, D. Miller, Darwen A.S. Large Characins: 1, J. and K. Corbett, Merseyside A.S.; 2, C. Sykes, C.A.G.B.; 3, Mr. and Mrs. Whitaker, Sandgrounders A.S. A.V. Characins (Pairs) (East Lancashire Society Silver Cup): 1, P. A. Moye, Basingstoke A.S.; 2, J. Lynch, Merseyside A.S.; 3, D. Milner, Darwen A.S. Sharks and Foxes: 1, Mr. and Mrs. Stevenson, Oldham A.S.; 2, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 3, P. A. Moye, Basingstoke A.S. Rasboras: 1, P. A. Moye, Basingstoke A.S.; 2, E. Mottershead, Bradford A.S.; 3, P. A. Moye, Basingstoke A.S. Danio and Minnows: 1, C. Tonna, Bracknell A.S.; 2, D. Milner, Darwen A.S.; 3, Mr. and Mrs. Bibby, Sandgrounders A.S. A.V. Carp and Minnow (Pairs) (The Warwick Shield): 1, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 2, B. Rowley, Bury A.S.; 3, P. Harris, St. Helens A.S. Corydoras and Brochis Catfish: 1, P. Harris, St. Helens A.S.; 2, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 3, T. Morris, Sandgrounders A.S. A.O.V. Catfish: 1, P. A. Moye, Basingstoke A.S.; 2, D. Cruickshank, C.A.G.B.; 3, H. Johnson, C.A.G.B. A.V. Catfish (Pairs) (The York Shield): 1, D. Cruickshank, C.A.G.B.; 2, C. Sykes, C.A.G.B.; 3, W. and A. Wright, Darfield A.S. Egglaying Tooth Carps (FNAS Trophy): 1, J. Roberts, Accrington A.S.; 2, D. Parkinson, St. Helens A.S.; 3, H. Johnson, C.A.G.B. A.V. Egglaying Tooth Carp (Pairs) (FNAS Silver Challenge Trophy): 1, B. Drake, Bury A.S.; 2, K. Buckley, Bridgewater A.S.; 3, R. Scoltock, Oldham A.S. Loach (FNAS Trophy): 1, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 2, Mr. and Mrs. Bibby, Sandgrounders A.S.; 3, P. Gibbins, Halifax A.S. A.V. Loach (Pairs) (The Durham Silver Cup): 1, Mr. and Mrs. Baldwin, Sandgrounders A.S.; 2, I. Stephenson, Merseyside A.S.; 3, Mr. and Mrs. M. Blackburn, Darwen A.S. Tropical Marine Fish (FNAS Silver Trophy): 1, B. Leyland, St. Helens A.S.; 2, B. Leyland, St. Helens A.S.; 3, B. Leyland, St. Helens A.S. A.O.V. Tropical Fish (FNAS Trophy): 1, A. Hodgson, Darfield A.S.; 2, Mr. and Mrs. Stevenson, Oldham A.S.; 3, L. Gatenby, Bradford A.S. A.O.V. Tropical Fish (Pairs) (Leeds and District A.S. Rose Bowl): 1, T. Stansfield, Ossett A.S.; 2, H. Campbell, Ashby A.S.; 3, J. Dean, St. Helens A.S. Breeders (Egglayers) 'A': 1, D. A. Gow, Darwen A.S.; 2, T. Stansfield, Ossett A.S.; 3, C. Sykes, C.A.G.B. Breeders (Egglayers) 'B': 1, K. Buckley, Bridgewater A.S.; 2, M. and L. Price, Ossett A.S.; 3, M. and L. Price, Ossett A.S. Breeders (Egglayers) 'C': 1, J. Saunders, Huddersfield A.S.; 2, M. Bollon, Pocklington A.S.; 3, D. Milner, Darwin A.S. Breeders (Egglayers) 'D': 1, D. Milner, Darwen A.S.; 2, W. and A. Wright, Sodit A.S.; 3, D. Milner, Darwen A.S. Breeders (Livebearers) 'A and B': 1, M. and L. Price, Ossett A.S.; 2, M. Strange, Basingstoke A.S. Breeders (Livebearers) 'C and D': 1, A. and S. Underwood, Bridgewater A.S.; 2, K. Buckley, Bridgewater A.S.; 3, M. Fawcett, York A.S. Amphibians (Non-dangerous) (The Keith Barraclough Trophy): 1, J. Pratchett, C.A.G.B.; 2, A. Stansfield, Ossett A.S.; 3, B. Rowley, Bury A.S. Individual Furnished Aquarium: 1, K. Robinson, Stretford A.S.; 2, D. Brightmoore, Stretford A.S.; 3, T. Kenyon, Stretford A.S. Aquatic Painting, 5-7 yrs.: 1, K. Moore, Stretford A.S.; 2, S. Lapéerre, Mountjoy A.S.; 3, D. Allen, Scottfield A.S. Aquatic Painting, 8-11 yrs.: 1, M. Carter, St. Helens A.S.; 2, K. Hoey, Stretford A.S.; 3, S. Moore, Stretford A.S. Aquatic Painting, 12-16 yrs.: 1, Tindall, Cardinal Langley; 2, D. Tonna, Bracknell A.S.; 3, Y. Carter, St. Helens A.S. Photography (Fish): 1, F. Codd, Bracknell A.S.; 2, B. Leyland, St. Helens A.S.; 3, B. Leyland, St. Helens A.S. Photography (Furnished Aquaria): 1, R. Atherton, Newcastle A.S.; 2, H. Buckley, Northwich A.S.; 3, D. Fryer, Halifax A.S. Aquatic Handicraft: 1, B. Walsh, Darwen A.S.; 2, S. Moey, Stretford A.S.; 3, I. Bentham, St. Helens A.S. Aquatic Handicraft: 1, Ranikhet Nursery; 2, D. Tonna, Bracknell A.S.; 3, L. Andrews, Bracknell A.S.

NEWS...

From Aquarists' Societies

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

SOUTH WEST

THE a.g.m. of the **Bristol A.S.** resulted in the election of the following Officers: president, H. C. B. Thomas; vice-presidents, V. Capaldi; secretary, V. Cole; treasurer, Mrs. J. Day; reporting secretary, Mrs. J. M. Thomas; show secretary, T. Mildon; show manager, J. Day; table show manager, R. Pinnock; equipment manager, G. Smith. The incoming President, H. C. B. Thomas, who was recently appointed a G. S. G. B. Judge, thanked the retiring President, Stan Lloyd, for his services to the Society during his term of office and for which a presentation will be made in due course. The reports of the secretary and treasurer individually reflected on the successful year and on the confidence and optimism in the future. Table Show Awards for 1982: S. J. Davis Trophy (Coldwater): J. Day. Crystal Goblet (Tropical): D. Garland, J. Hughes, Miss H. Morgan, a tie! J. and J. Phillips Trophy: Vic. Capaldi. Away Points Trophy: Les. Thomas; the secretary is Vic. Cole, 10 Hardwick Close, Brislington, Bristol BS4 4NL. (0272-711286) who will be pleased to help with advice on Coldwater Fish or on details about the Society.

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THE new secretary of **North Avon A.S.** is Mr. R. W. Cummins, 1 St. Annes Close, Cadbury Heath, Warmley, Bristol BS15 5EH.

SOUTH EAST

IT was a successful evening for the Edwards Family, who come from Margate, when they attended the December meeting of the **East Kent Aquatic Study Group.** John Edwards was the winner of the annual Aquarist Quiz, with daughter Sharon in third place. Second in the quiz was Andrew Aspital, from Whitstable. Fourty members attempted to answer the fifty questions which were written and asked by last year's quiz winner, David Jane. John's wife Pat Edwards was not to be left out of things, for she obtained two first places in the table show. Guest judge was Mr. C. Panell who judged the three classes for breeders teams. He awarded cards to: Tropical Egglayers: 1, P. Edwards; 2, R. Marsh; 3, C. Bridgeman; 4, B. Marsh. Tropical Livebearers: 1, 2, 3 and 4, A. Aspital. Coldwater: 1, P. Edwards. Prospective members and guests are made welcome at meetings held on the second Tuesday of each month at the Memorial Hall, Beltinge, Herne Bay.

THE **Bedford and District A.S.** will be holding their second open show provisionally in early May and would appreciate any early return of trophies won at last year's open show or, if anybody has information of the whereabouts of the aforementioned trophies please contact either the Open Show Secretary, Mr. M. Dashwood, 27B Saint Michaels Road, Bedford, Beds. or the Assistant Open Show Secretary, Mr. C. Daniels, 46 Wendover Drive, Bedford, Beds.

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DECEMBER 21st was the date of the **S.P.A.S.S.** Christmas night. The meeting took on an informal atmosphere. Food and drink was supplied, with both new and old members being given the chance to mingle and spend time discussing their favourite subject—fish! During the evening chairman Gerry Herring made a special presentation of an engraved carriage clock to Mrs. Marguerite Dudley. Marguerite is a founder member of the society and has put a considerable amount of work and effort into S.P.A.S.S. over the last 15 years, which is reflected in the clubs present strong positon. This was the memberships way of saying thank you. South Park Aquatic (Study) Society specialises in coldwater fishkeeping and meets at 8 p.m. on the 3rd 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 5662).

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AT the a.g.m. of **Southend, Leigh & D.A.S.** the following officers were appointed: president, D. Burgess; vice-president, A. Cooper; treasurer, D. Baron; secretary, D. Chesewright, 2 Cedar Avenue, Wickford, Essex. It was reported that there were over 90 members. Meetings are held at St. Andrews Hall, Southview Drive, Westcliff-On-Sea, Essex, at 8.15 p.m. on the 1st and 3rd Tuesdays of each month. Visitors to the area are always welcome.

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THE **East Kent Aquatic Study Group** held their a.g.m. at the Memorial Hall, Beltinge, Herne Bay on 11th January. In his report the outgoing chairman reported on some of the many enjoyable events and competition successes that the society had achieved over the past year. The trophies for 1982 were presented by the special guest for the evening, Mr. Ken Saxby, who is Chairman of the F.B.A.S. He presented 30 small awards for the class winners of the years table shows and major trophies to: Highest Pointed Member, P. Edwards; Highest Pointed Lady, V. Bird; Highest Pointed Junior, S. Mason; Breeders Cups, P. Edwards and A. Aspital; Best Pair of Fish, C. J. Bridgeman; Best Home Aquarium, T. Webstell; Best Home Pond, R. Gutsell; Quiz Winner, A. Aspital; Chairmans Award, R. Spoore. After a break for refreshments the retiring committee were thanked for their hard work throughout 1982, then followed the election of officers and committee for 1983: Chairman, R. Spoore, 23 Godden Road, Canterbury; Sec./Tres., C. J. Bridgeman, 150 Greenhill Road, Herne Bay; Committee: W. Clarke, K. Wobby, T. Webstell, G. Neaves, J. Edwards, J. Gilbert, and B. Colmer. Meetings will be held on the second Tuesday of each month at the above venue when both novice and experienced fishkeepers will be made very welcome.

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THE **Bedford & District A.S.** held their a.g.m. in December and the New Secretary is Mrs. A. Neish, 39 Ettrick Drive, Elms Farm, Bedford.

NEW SECRETARY

AT the **Walthamstow & District A.S.** a.g.m. David Millins, 37 Grantock Road, Walthamstow, London E17 4DP, was elected Secretary.

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NEW SOCIETY

ON the 17th January a new Aquarist Club will be formed. It will be known as the **Pangbourne and District A.S.**

MIDLANDS AND WALES

Northampton and District A.S. club officers: President, Mr. A. Robinson; Chairman, Mr. W. Earl (Tel: Northampton 404041); Treasurer, Miss W. Wright; Secretary, Mrs. S. Stevens (Tel: Northampton 64907). The club meets on the first and third Thursday of every month at the St. Johns House, 33 Billing Road, Northampton. New members and visitors most welcome.

NORTH

AT the a.g.m. of the **Northern Coldwater Fish and Pondkeepers Society** the following officers were elected: chairman and show secretary, Mr. J. English; Henderson Filters, Throckley, Newcastle Upon Tyne; secretary, Mr. H. Kennard, 2 Mill House Cottage, Meldon, Morpeth, Northumberland NE61 3QL.

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AT their open show on 26th June **St. Helens A.S.** at Rainhill Village Hall, following officers were elected: chairman, Mr. B. W. Carter; hon. secretary, Mrs. H. Steadman, 10 Ribble Avenue, Rainhill, Liverpool L35 0NJ. (Tel: 051-426-4213); show secretary, Mr. P. Banks, 9 Gregory Street, Leigh, Lancs. (Tel: Leigh 607026).

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AT the a.g.m. of the **Northwich & District A.S.** the following committee were elected: Chairman, Mr. H. Buckley; Hon. Secretary, Mr. S. Gallimore, 39 Lydyett Lane, Barnton, Northwich, Ches. (Tel: (0606) 76844). Treasurer, Mr. L. Bradley; Librarian, Mr. A. Myers; Open Show Secretary, Mr. D. Valentine; Assistant Show Secretary, Mr. F. Percival; Table Show Secretary, Mr. J. Buckley; Social Secretary, Mr. M. Rowe; B.A.F. Organiser, Mr. L. Thorne.

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AT the a.g.m. of the **Whitby and District A.S.** a new committee was formed: secretary, E. Bryant; 64 Mayfield Road, Whitby, North

Yorkshire. Treasurer, F. Tolomeo; The Flat, Argyle Garage, Whitby. Chairman, T. Wilson; 1 Helredale Gardens, Whitby. Open show secretary, G. Taylor; 28 Runswick Avenue, Whitby. Table show secretary, R. Wood, Danes Hill, Meadowfields, Sandsend. Judge, D. Forbes; 12 Lockton Road, Whitby.

SCOTLAND

AT the December meeting of **Paisley & District A.S.** the table show was of Danio's, Rasbora's and Tropical Minnows. Results: Senior League: Danio's; 1, Ian Lindsay; 2 and 3, Evelyn Lindsay; 4, Stuart Hamilton. Rasboras: 1, Ian Lindsay; 2, Evelyn Lindsay; 3, Stuart Hamilton. Junior League: Danio's; 1, Dylan Lafferty. Tropical Minnows: 1 and 2, Richard Brooking. Meetings are held on the first Tuesday every month at the Paisley Museum & Art Galleries, High Street, Paisley at 7.15 p.m. to 9.15 p.m. Everyone welcome, further information can be obtained from the club secretary; Mrs. E. Lindsay, 71 Wright Street, Renfrew, Renfrewshire PA4 8AS. (Tel: 041-889 5772).

Dates for the diary

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

FEBRUARY

6th February: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** A.G.M. in Norwich at the home of Mr. and Mrs. L. O. Crosby. Any enquiries telephone the Secretary, Mrs. O. E. Crosby on Norwich 412095.

12th February: SOUTHERN LIVE-BEARERS AQUATIC GROUP, Yorkshire Area Group, meeting at Thorne Town Council Assembly Rooms, Thorne, near Doncaster, 3 p.m. Slide show and talk on "A Recent Trip to Mexico" by Mr. J. Scarll D. Barrett and Mr. D. Thompson. New members welcome. Full details from Group Secretary, Tony Smith, 41 Hilderthorpe Road, Bridlington, Yorks. YO15 3AZ.

13th February: SHEAF VALLEY A.S. 11th open show at the Dormer Twist Drill Company. For further information, contact Show Secretary, T. Matthews, 1 Acre Close, Killamarsh, Sheffield S31 8QH (0742 480206) or D. Golland (0742 246046).

21st February: SOUTH EAST A.S. bring and buy at Hampton Football Club, Club House, Station Road, Hampton, Middlesex, 7.30 p.m.

MARCH

6th March: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Norwich, with a film show on Koi, for further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

6th March: BRITISH KOI KEEPERS' SOCIETY annual general meeting, at the Post House, Leicester, commencing at 1 p.m. After the interval the Guest Speaker will be Dr. P. Miller, the Zoologist, talking about stress in Cyprinous Carpio, with particular reference to Koi. His talk will be illustrated with slides and diagrams. For further information, write to the Membership Secretary, 3, Horncastle Road, Moston, Manchester.

6th March: HARINGEY A.S. 1st open show at Pax Hall, 59, Park Road, Hornsey, London. Further details and schedule from A. Dempsey, 31, Oakfield Road, London N4 4NP.

20th March: SKEGNESS & DISTRICT A.S. sixth open show at the Imperial Cafe, North Parade (opposite pier), Skegness. Benching 12-2 p.m. Judging 2.15 p.m.

20th March: RUNCORN A.S. open show at St. Edward's Church Hall, Ivy Street, Runcorn, benching 12-2 p.m. Further details, schedules, etc, from Mrs. R. Muckle, 23, Adela Road, Runcorn WA7 4TU. (Tel: 76099).

27th March: CENTRAL MIDLANDS CICHLIDS GROUP Second exhibition and auction at the Peace Memorial Hall, Pinfold Lane, Penkridge, Staffs. Items for auction may be handed in from 10 a.m. onwards. Auction commences at 1 p.m. Further details from Mrs. Maureen Hall, 71 Saxon Road, Penkridge, Staffs. Tel: Penkridge (078 571) 3944.

27th March: First open show at the Grange Farm Hobbies Centre, Scunthorpe, South Humberside. Judging will be to Y.A.A.S. standards.

APRIL

3rd April: MALVERN & DISTRICT A.S. 10th open show at Christ Church Hall, St. Barnards Green, Malvern. 1st place trophies as well as perpetual trophies. Enquiries to: Show Secretary, S. K. Yallop, 3 Monkhide, Yarkhill, Ledbury, Herefordshire. HR8 2TX. (Tel: Trumpet 562).

3rd April: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Bradwell at the home of T. D. Batterbee. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

10th April: TAUNTON & DISTRICT A.S. open show at the Taunton Youth and Community Centre, Tangier, Taunton. Schedules from Mr. R. Cooper, 14 Rochester Road, Taunton TA2 7LD.

10th April: BISHOP AUCKLAND A.S. open show at the Bishop Barrington Upper School, Woodhouse Lane, Bishop Auckland. Benching 12—until 2 p.m. and judging at 2.15 p.m.

24th April: YEOVIL A.S. open show, Parish Hall, Marnock, Somerset. Schedules (S.a.e. please) from T. C. Perry, 316 St. Michael's Avenue, Yeovil, Somerset BA21 4NF.

24th April: BRITISH CICHLID ASSOCIATION auction, principally of cichlids, but also of books and other fish-related items, at the New Imperial Hotel, Temple Street, Birmingham (near New Street station), commencing at 12.00. Further details can be obtained from Ian Sellick, 16 Kingsley Road, Bristol BS6 6AF, on receipt of a stamped addressed envelope.

24th April: MERSEYSIDE A.S. open show at the Rainhill Village Hall, Rainhill, Lancashire.

MAY

1st May: CORBY & DISTRICT A.S. open show in the Festival Hall, Corby Civic Centre. Schedules from Alan Henderson, The Nook, Corby, Northants. Tel: Corby (05365) 68269.

1st May: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Norwich at the home of Mr. C. E. Page. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

1st May: HULL A.S. open show.

8th May: BOURNEMOUTH A.S. annual open show at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show schedules available from 1st April from Show Secretary, Jack Jeffrey, 13a Woodland Avenue, Bournemouth BH5 2DJ, Dorset. (S.a.e. would be appreciated).

14th May: SOUTHEND, LEIGH & D.A.S. open show at St. Clements Hall, Leigh-on-Sea, Essex. Show Secretary: D. M. Chesswright, 2 Cedar Avenue, Wickford, Essex. (Tel: Wickford 2531).

14th May: NORTH AVON A.S. 6th open show, at the Church of the Good Shepherd, Church Hall, Kings Drive, Bishopston, Bristol. Further details from Show Secretary, Mrs. K. M. Gadd, 17, Braydon Avenue, Little Stoke, Bristol.

15th May: BEDFORD & DISTRICT A.S. 2nd open show at the Bunyan Centre, Mile Road, Bedford. Further details from Mick Dashwood, 27B, St. Michaels Road, Bedford.

22nd May: ABERDARE A.S. first open fish show at Aberaman Y.M.C.A., Aberaman, Aberdare. Further details to follow.

22nd May: ACCRINGTON & DISTRICT A.S. open show at New Jerusalem Church Hall, Hargreaves Street, off Manchester Road, Accrington. Details from S. Walsh, 133, Lammack Road, Blackburn, Lanc's.

JUNE

4th June: SWINDON A.S. open show at Park South Community Centre, Cranmore Avenue, Swindon. 1st place trophies as well as perpetual trophies. Show Secretary, Mr. C. E. Curtis, 78 Beech Avenue, Swindon, Wilts. (Tel: 0793 32920).

5th June 1983: SUDBURY A.S. 11th open show at Neasen High School, Quainton Street, Neasden, NW10. Further details from Barry Witteridge (tel: 01-904 0828).

5th June: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Norwich at the home of B. R. Beane. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

11th June: NAILSEA & DISTRICT A.S. open show at the Clevedon Community Centre. Details from Show Secretary, Mr. M. J. Ellick, 3, Burrington Close, Nailsea, Bristol. (Tel: Nailsea 854158).

12th June: NORTHWICH & DISTRICT A.S. open show at Hartford High School, Greenbank Lane, Chester Road, Northwich, Cheshire, details from Show Secretary, D. Valentine, 43, Hartford Road, Davenham, Northwich, Cheshire. (Tel: Northwich 6624).

JULY

3rd July: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Norwich at the home of Mr. D. Goose. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

AUGUST

6th August: NORTHERN GOLDFISH AND PONDKEEPERS SOCIETY 7th open show at the Sports Center, Silverwell Street, Bolton, Greater Manchester. Details and entry forms from R. Hodgkinson, 9 Stratford Close, Farnworth, Bolton BL4 0LZ. S.a.e. with application please. (Tel: 0204 75283).

6th August: BRISTOL TROPICAL FISH CLUB open show at W.D. & H.O. Wills Recreation Hall, New Charlotte Street, Bedminster, Bristol. Benching 9.00 a.m.-12.00 noon. Schedules will be available from mid-June from Show Secretary Mr. T. E. Davis, 264, Badminton Road, Coalpit Heath, Nr. Bristol BS17 2QW. S.A.E. with application please.

7th August: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Barham at the home of Mr. M. J. Cranke. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.