

SEPTEMBER 1981 60p

AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



Illustrated colour feature
Net in hand in Borneo

Spotlight on
Flagfin Angelfish



THE AQUARIST

AND PONDKEEPER

Britain's Leading Magazine for Fishkeeping

Published Monthly 60p

Printed by Buckley Press,
The Butts, Half Acre,
Brentford, Middlesex.
Telephone: 01-568 8441

Subscriptions:

Renewable 31st December
annually Magazine (Surface
mail). October-December 1981
£2.50. Airmail quoted on
request.

MSS. or prints unaccompanied
by a stamped addressed
envelope cannot be returned
and no responsibility is accepted
for contributions submitted.

Founded 1924
as "The Amateur Aquarist"

Vol. XLVI No. 5, 1981

Editor: Laurence E. Perkins

Advertisement Manager:
J. E. Young

Our Cover:
Pelvicachromis pulcher
with fry.
Photo by
A. van den Nieuwenhuizen

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The Editor accepts no responsibility for views expressed
by contributors.

Editorial

To each his own

ADMIRING an active shoal of large golden orfe swimming in a big formal pond in a public garden recently, I was surprised to be asked by another bystander whether the 'carp' were good to eat. In response I couldn't forbear from replying that I didn't know but had heard that cocker spaniels were regarded as being toothsome by certain gastronomes. The man treated me to a withering look as he tightened his hold on the lead attached to his spaniel which had been nosing my shoes with some interest.

On reflection, it could be regarded as reasonable that non-aquarists should envisage a culinary dish at the mention of fish but it still remains surprising that the colourful spectacle of ornamental fish can stimulate anyone's taste buds.

Aquarists become accustomed to the surprise evinced by their non-aquarist friends at their near fanatical absorption with aquarium and pond fish and when such a friend is not in thrall to any hobby, he may be forgiven for his puzzlement, one may suppose. Not so acceptable are remarks of censure by those who also have an abiding interest but in something quite removed from that of the fishkeeper.

I once had among my tanks one containing an African clawed toad (*Xenopus*), an endearing female whose creature comforts I catered for over a period of nearly ten years. Almost nightly I would survey the lawn by torchlight in

search of succulent worms for her delectation. My next door neighbour had recently purchased one of the last redundant London tramcars but as he could not accommodate it in his home nor his garden, had contrived to furnish his den with the seats from the upper deck of another out-of-service tram. Seemingly, he donned the uniform of a tram-conductor on occasions when friends joined him to share his other passion, music. Upon their arrival he would issue them with tram tickets, clipping them and then showing them to their tram seats ranged in front of the record player.

Each to his own but share my astonishment at his effrontery when one night, as I grubbed for worms to sustain Josephine, I heard his voice, directed at my activities from the window of his upstairs tramcar den, mutter: "Ruddy idiot!"

The British are renowned for their so-called eccentricities and it is true that we can lay claim to more societies and associations, devoted to every conceivable field of interest, than any other nation. That some of the hobbies involved appear strange to those beyond the fringe of these pursuits is understandable but we should be able to accept our differing activities and enjoy the compliment inherent in the label of eccentric. To differ from the moron who has interest in nothing affords grounds, surely, for feelings of some satisfaction. That we aren't all aquarists or all tram-collectors must be even more laudible for it is our differences in this context that enable us to sustain reason in these days of unreason. Certain it is that, however odd we may appear in that we derive so much pleasure from keeping fish and bandying about such names as *Erpetoichthys calabaricus*, it cannot be a bad thing to display one's wonderment at the sometimes unbelievable phenomena attendant upon the teeming life forms which motivate us in our hobby.

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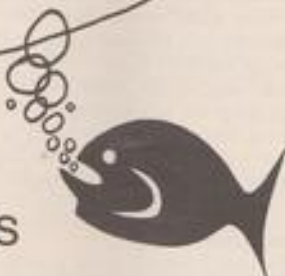
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See the next edition of **The AQUARIST** for further details!

COMMENTARY

by
Roy Pinks



Savage Spring

THOSE WHO LIVE in the country are quick to react to unusual happenings in nature, and as I recorded in my diary on 22 April that the cuckoo and the swallow had arrived here on the same day this year, after an exceptionally benevolent winter, I could not help wondering what the price to be paid might turn out to be. Three days later came the answer. After days of unusual cold, light snow on the evening of Saturday 25th turned the landscape back several months over much of the country, and up to a foot of snow fell overnight. I was out and about at four in the morning doing my best to save the limbs of many of my trees and shrubs from an incredible build-up of snow: in the muffled atmosphere all one could hear was groaning and cracking branches—all was too clearly visible from the continuous and violent flashing from arcing or damaged power lines, so for many here was another of nature's disasters, arriving when least expected.

The ponds had disappeared into the landscape, together with new lambs, young birds and much more which had the day before promised much, and when daylight finally came there were all the agonies of loss and damage and hardship, the end to which could not clearly be seen. As the radio conveyed some of the extent of the chaos to anxious listeners later in the day we heard a local appeal for the loan of a 3 kW generator to the Everglades Aquatic Nurseries up at Baunton, where power had been off for some time and many thousands of tropical fish were in danger. As a fresh storm was just then apparently setting in for the night we pondered gloomily on our friends' prospects.

The heroic and astonishing efforts of the power and telephone repair and maintenance were dwarfed by the immensity of the problem. This was not just a heavy snowfall, but an instance where sloppy and heavy flakes of snow descended just when the temperature was wobbling round freezing point. The result was a build up of snowy slush on anything which would hold it, and overhead lines and trees, partly leafed, were ready

victims. The reports of power outages grew more and more alarming, and it became evident that in some cases it would be days rather than hours before warmth could even begin to return.

Thousands of folk were inconvenienced by the loss of comfort, and those with deep freezes pondered deeply on their value. Those with tropical animals to safeguard were probably able to cope with the shorter power cuts, but where these lasted for days the survival of these creatures depended more on the ingenuity and initiative of their owners than on planning, for we usually get quick reconnections even in the worst conditions. Though paraffin heaters are the usual standby in such circumstances, calor gas has really come into its own in recent years, and a heater, together with a couple of spare cylinders, may be regarded by the fishkeeper in some of the more vulnerable areas, as an essential investment.

Most happily, the Everglades episode ended without tragedy. Although locally there were incredible odds to work against, the power was restored several hours after the appeal. And one generous farmer telephoned at three in the morning to offer the loan of a generator. We will have all learnt something from this sort of disaster, and I hope we shall all be better equipped next time trouble strikes. Meantime we have been gathering up the broken branches and building bonfires, and with the resilience which nature gave them many bloodied victims are bending back into shape.

HAPPY BIRTHDAY

Years ago when I was still at school and kept fish and reptiles and all manner of strange creatures in cages, boxes and aquaria—and often quite disgracefully loose—I used to read about how to manage them in various respectable journals like the *Aquarist* and *Water Life*. Quite regularly there were articles by Betts and Derham and Perkins and other distinguished authorities, but there was one writer named Hems who wrote about all and everything, and as he was doing this from first hand I mentally docketed him as not only being authentic, but as being very old.

In later years I read the books he composed with George Hervey, and I met them both at London shows. Talking with them was always a champagne experience—sometimes about fish, often of more shapely beings, then of politics, Strauss operas and eastern mystics.

I was very sorry to hear that George Hervey died not so long ago, but at the same time I was most agreeably taken aback to learn that Jack Hems is, at the time of writing, not yet 70. However, he will have reached this milestone, so I understand, on 23rd May, and I should like to express to him, on behalf of everyone in the hobby, our affectionate greetings. A Churchillian figure across the years, he has both entertained and instructed us in the art of fishkeeping in a highly individual way, and his erudition was matched only by the high regard and popularity in which he is held at all levels in the hobby. Happy Birthday, Jack, and long continued power to your pen!

DISCUS

Success at last

by P. R. Allen

MY LAST ARTICLE on the subject of discus spanned the years 1971 to 1976 ending with what was then a big achievement—keeping them alive and actually growing. These fish continued growing well and in 1978 when they were sold had grown into extremely attractive 4-5 in. long fish. The reason for selling them was yet another of my jobs and, consequently, home changes. Until then, although they were perfectly healthy, no breeding activity had taken place or at least none had been observed.

Once settled in our new home I threw myself wholeheartedly into my fishkeeping activities, this time concentrating totally on discus. Prior to this I had always kept a wide range of fish, some for breeding, some for showing and some for just looking at. My previous efforts with discus had always been using a clinical (unplanted) or what I call a semi-clinical method (any plants planted in flower pots with little or no gravel on the base of the tank).

Attractive set-up

This time I decided to use a more natural set-up, I wanted the aquarium to be pleasing to the eye as it was to be situated in my lounge. Using a 4 ft. all glass tank I positioned a couple of nylon stockings full of aquarium peat (soaked for two weeks beforehand in a bucket of water) on the base of the tank and then covered these with a 3 in. layer of ordinary medium grade aquarium gravel. As decoration I used some bogwood (oak roots washed up on the bank of our local reservoir), one or two large pieces of slate with the edges rounded off and a broken earthenware pipe. Half of the aquarium was heavily planted with several Amazon sword plants and various species of cryptocoryne. Only this planted end of the tank was illuminated using a 40 watt incandescent bulb, thus giving a gradient of light intensity from very bright down to semi-darkness. The overall effect of this was very interesting to look at and also good for the fish. The peat and bogwood were included partly as a mild form of acidifying and slightly softening the water, as well as their aesthetic appeal. No filtration of any sort was used in the tank, although the water was aerated. In order to keep the gravel fresh and remove any uneaten food a few Malayan burrowing snails were introduced into the tank. I have always been a great believer in these small cone shaped snails, as they constantly move the gravel around and stop any areas going black and giving off foul gases. (They also do not eat any of the higher plants). The aquarium was filled with ordinary tap water—pH 7.0, dH 16° and heated to a temperature of 88°F.

The fish

After the aquarium had matured, in about three weeks, ten fish were purchased. Six of these were bought from a local discus enthusiast when they were 8 weeks old and approximately $\frac{1}{2}$ in. long. The parents were beautiful blue discus each about the size of a small dinner plate. Incidentally, his set ups were all semi-clinical and not natural as in mine. His system seemed to work well because the 100+ youngsters were all feeding ravenously

on a special mixture made up by him. (Recipe for mixture given later). The remaining four fish I bought were also blues but these had been imported from Singapore. They were much smaller than the others, being only $\frac{1}{4}$ in. long, but nonetheless were in excellent condition. After introducing the fish all went well and they began feeding immediately. No check in their growth rate occurred at this time or at any other time during their lives. 25% of the water was changed every week and the fish thrived and grew rapidly on the special food mixture for the next ten months.

The recipe for this food mixture is laid out below:

1 lb. Ox Heart (with all the fat and sinues removed).

4 oz. Frozen Spinach (finely chopped).

1 oz. Bemax or similar wheatgerm product.

1 oz. Good quality dried flake food.

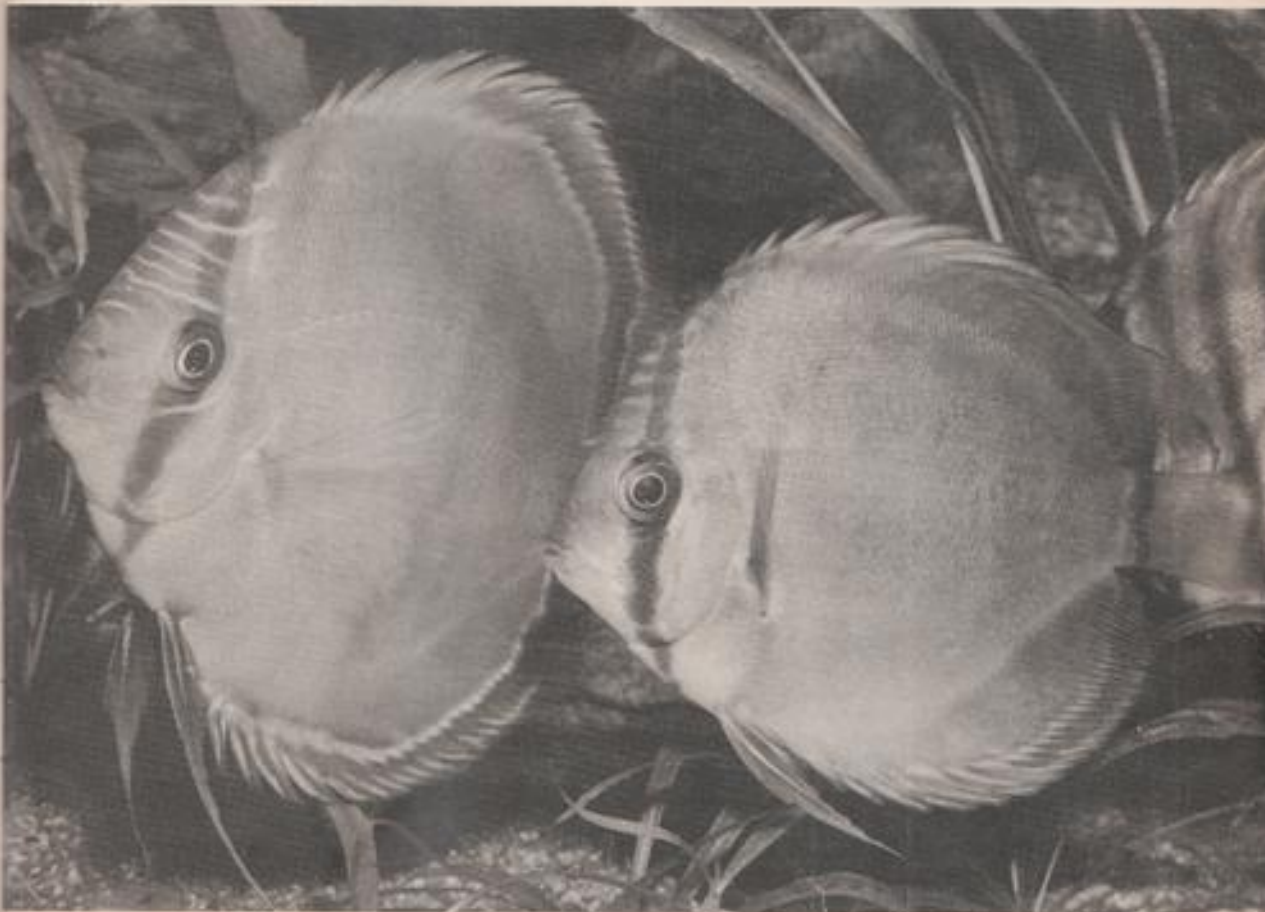
All the above ingredients are initially minced together and then liquidised. The blended mixture should then be frozen, either as individual portions or as a block. If it

is frozen as a block sufficient mixture can be scraped off with a serrated knife or a razor blade, the remainder of the block being returned to the freezer. Please ensure that the mixture is completely thawed prior to feeding to the discus or severe digestive problems may occur.

Other foods were also supplied; whiteworm were fed only occasionally because the fish can become imprinted on them if fed too often and subsequently refuse all other foods, flake food in small quantities and freeze dried *tubifex* as a regular part of their diet. (No live *tubifex* was fed). Also glassworm (*Chaoborus* sp) when available were avidly eaten and their appetites for these transparent midge larvae could never be satisfied. The fish were fed five or six times daily, three of the meals consisting of the mixture and the remaining two or three meals a variety of the other foodstuffs.

Aggression

By July 1979, exactly one year after purchase (fish were



now 14 months old), they had grown extremely well—the largest being a little over 4 in. in length and the smallest about 3 in. long. It was at this time that some aggressive behaviour between the fish was noted and on the 28th July 1979 a pair separated away from the others and spawned. On the day in question we had had a large drop in barometric pressure and the pair spawned between 9 p.m. and 10 p.m. during a thunderstorm. (Subsequent spawning often occurred during drops in barometric pressure and nearly always late in the evening). The 80 plus eggs were deposited on the front glass between 4 in. and 6 in. above the gravel and on an angle of 45° uphill from left to right (from the fishes' point of view). Once spawning was completed the other discus in the tank were taken out and placed in another tank, leaving the pair alone. This exercise proved to upset the breeding fish and they huddled together in a corner of the aquarium taking no notice whatsoever of their freshly laid spawn. The light was left on throughout the night and by first light next morning they had returned to the eggs. (It may be worth noting that this and every other spawning took place in the dimly illuminated end of the aquarium). Initially both parents tended the eggs but as the day wore on the male became very possessive and protective towards the eggs and drove the female off. 14 eggs went white and were removed on the first day. Unfortunately, during the next night one or both of the parents ate all the eggs.

Two subsequent spawnings followed similar lines with the male fish becoming very aggressive and finally consuming the eggs. The fourth spawning on September 8th 1979 (they spawned on average once a week) was slightly more promising and before the eggs were eaten it could be seen that they were fertile (dark eyes). These eggs, in fact, fungussed before being eaten. I decided upon seeing this that water conditions were unfavourable and began changing the water more frequently; two-25% changes per week. This time I used rainwater, that had been filtered using a diatomic filter, to replace the water removed from the tank. The fish seemed unconcerned with anything I did and carried on spawning regularly and just as regularly eating them. By the tenth spawning the parents appeared to get on better together, both tending the eggs until they fungussed and were eaten. I concluded from this continual fungussing of eggs that despite increased water changes, the water was not 'pure' enough to successfully hatch them. (Using the 'natural' methods has inherent problems with bacteria). Discussing the problem with the president of the B.D.A. (British Discus Association) he suggested I try antibiotics in an attempt to stop the eggs dying (and becoming mycotic) prior to hatching. The antibiotic which suggested itself to me was 'Penbriton' 100mg which I had used previously for curing non-specific diseases in other tropical fish; however on this occasion after consultation with my veterinary surgeon and also Mr. A. Jenno (Tamworth Aquatics) (President B.D.A.) I decided to use 'Ampifin' 250mg. So prior to the twelfth spawning I dosed the aquarium with the contents of one capsule of 'Ampifin.' Immediately after spawning I poured the contents of another capsule directly over the

eggs. From this spawning one egg actually hatched before all were eaten. The thirteenth and fourteenth spawnings were dismal failures, the eggs disappearing shortly after completion of egg-laying.

Free-swimming fry

The fifteenth spawning was treated similarly with antibiotics and approximately 60 hours after spawning the eggs hatched. 50 hours later the fry were becoming free swimming and the parents were kept busy retrieving them and blowing them back onto the spawning site. 12 hours later only six fry could be seen feeding on the sides of the parents and by the following morning none could be found anywhere in the tank. The sixteenth spawning on January 11th 1980 proved successful and on February 12th 1980, 35 young $\frac{1}{2}$ in. discus were separated from their parents. The eighteenth spawning also proved successful and 45 babies were reared.

My observations on the first successful spawning is laid out below:

| Date | Time | Comments |
|---------|---------|---|
| 11-1-80 | 6 pm | Pair commenced spawning on broken pipe. |
| 11-1-80 | 7 pm | Completed spawning. Small approx. 80 eggs. 1 'Ampifin' 250mg added. |
| 12-1-80 | 6 pm | 13 eggs opaque—removed. Changed 2 gals. water. |
| 13-1-80 | 6 am | Remaining eggs all O.K. Eyes visible. |
| 13-1-80 | 6 pm | One or two tails seen wagging. |
| 13-1-80 | 10 pm | All hatched. Parents moved them about 2 in. |
| 14-1-80 | 6 pm | Fry moved onto slate at other end of tank. Changed 2 gals. water. |
| 15-1-80 | 6 pm | Parents still tending fry. |
| 16-1-80 | 6 am | Fry becoming free swimming. |
| 16-1-80 | 12 noon | Fry feeding on parents. Changed 2 gals. water. |
| 17-1-80 | 6 pm | Fry still feeding. Bellies fat and appear white. |
| 3-2-80 | | Fry starting to feed on small particles of mixture. |
| 7-2-80 | | Fry eating well. $\frac{1}{2}$ in. long. |
| 12-2-80 | | Removed fry from parents. 35 in total. |

As you will have realised, my attempts at breeding discus have been fraught with disasters and disappointments balanced by a great deal of pleasure and a sense of achievement. Breeding discus had been my greatest aquatic ambition and hopefully I shall be able to use the knowledge and experience gained to move forward in the hobby and try to breed some of the so-called "impossibles."

How DANGEROUS is a globe of goldfish, or an aquarium tank in the house? Few of us would consider these a fire risk; but it was suggested by the authorities after a recent fire that the curtains were probably set alight by the sun's heat concentrated in its reflection off the goldfish-bowl in the room.

To obtain a broad picture of the migration of sea-bass throughout their British range, with a view to conserving their declining numbers, the Marine Biological Association recently received a grant of £5,723 for tagging these fish off the coasts of Essex (by rod and line from boats) and Pembrokeshire (by seine nets from the beach). This follows a series of scale studies in the area which found these two parts of our coasts specially important. They will be using tags designed for striped bass studies in North America.

The new Fishery Act which became law last July now makes it illegal to kill dolphins and porpoises, as well as any other whales, in British waters or by British ships anywhere in the world. This presumably protects stranded whales from being shot and used for pet food, or hunting whales for oil or pet food in Scottish waters, which took place since the war.

Fish-farmers are exempted by the act from certain fishery controls and derated. Property rights in shellfish-beds are extended to rafts and cages, either floating or suspended in the water. Grants will also be made to them. Compulsory slaughter of farmed fish is proposed in the event of outbreaks of viral haemorrhagic septicaemia or infectious haematopoietic necrosis, which still infects spawning on many rivers. Compulsory registration rather than licensing is proposed for fish-farms, and the problems of emissions and water-abstraction by them licensed. The Water Authority's responsibility for controlling fish-movements would be restricted to public waters for which they have management responsibilities. Fish-farmers would be obliged to maintain movement-records, for use in tracing disease outbreaks. Comments on these proposals are invited by the Government and should reach Fisheries Division 1A, Room 368, MAFF, Great Westminster House, Horseferry Road, London SW1P 2AE, or its Welsh Office, Cardiff CF1 3NQ, by October 30th.

Amateur Divers

I wonder if it is in the best interests of conservation to encourage more amateur sub-aqua-divers to fish for lobster, scallops and other declining crustaceans and shellfish along our coasts. The Plymouth scallop-fleet pulled out of Cardigan Bay last spring because the fishery collapsed. Scallops are interesting for the way they swim, opening and closing their shells in the action. Sub-aqua divers as well as fishermen and naturalists will find a recently published book *Scallops and the Diver Fisherman* by David Hardy, an experienced scallop-fisherman of the Scottish west coast (Fishing News Books, £8.50) rather expensive for 132 pages, but very informative on both divers' training and dangers, and on locating scallops and their choice of haunts in relation to different types of seabed. Brief notes are



by
Eric Hardy

also added on abalone and crawfish, and the author doesn't overlook any practical and business difficulties of such a venture. One hopes that the scallops aren't further depleted as were the more mobile queens, a smaller species, during the bonanza west coast fishery a few years ago. Recent advances in shellfish culture could "farm" more scallops to augment stocks. It has been tried in bays of West Cork. Most beds are off the South-west, from Cornwall to Fishguard, but the common scallop ranges from Dover to the Firth of Clyde and Norway, occurring also off Southern Ireland, the Isle of Man and Holyhead, as well as the French coast and Spain. Usually on clean sand or gravel, it also lives on small sandy patches among rocks, and the edges of banks, down to 50 fathoms. It excavates depressions to "sit" camouflaged in soft sand-silt. Scallops have been kept in aquaria at marine biological stations and they have been observed by underwater television. Recent scientific studies were mostly at Start Bay (Devon), Weymouth and Holyhead. Albino scallops occur sometimes, but the stocks of slower breeding English Channel scallops would probably not recoup from any greatly increased fishery by divers or dredgers. Collecting now endangers the queen conch of the Bahamas and Caribbean

seas. Its pink-lipped shell, fashionable with tourists, may be saved by "farming".

Stoneworts

During a recent survey of the famous Camargue reserve at the Rhone Delta of southern France, Guerlesquin and Podlejski, of the biological station there, collected 21 species of stoneworts or *Characeae*, the fascinating submerged algae which branch to several inches long and encrust their bodies with an exoskeleton of carbonate of lime. These species varied with water depth in 35 waters there, also by salinity, type of bed and permanence or otherwise of the water. Two notable species are *Nitella hyalina* and *Nitellopsis obtusa*. The Camargue is the haunt of several other interesting water-plants, such as fringed water-lily, which isn't a water lily, and our white and yellow water-lilies which are, the water-fern *Azolla*, frogbit, the bladderwort *Utricularia* and the ubiquitous Canadian pondweed.

Shelduck and, to a lesser degree, the famous flamingos there feed on the cysts of brine-shrimps and excrete them in a viable state. They thus aid their distribution in the birds' own wanderings.

Falling leaves, brown and bright, now pollute our garden ponds where waterlife is dying down. Winter buds form on bladderwort, frogbit and water-violet, falling to the bottom in October or November unless retrieved for future propagation. Bursting capsules of poisonous iris should be kept from children. Bright banners of Chinese *Salix bockii* crowded with conspicuous catkins, attract admiring attention.

"Water-lily" tulips, early-flowering *kawfmaniana* hybrids, are named from their gaping flowers, not aquatic haunts. Their bulbs are now planted 4 ins deep in well-drained banks of pools in sun or shade, but not in the water. They establish themselves quickly with little more than a top-dressing of bonemeal. Creeping rhizomes of North

American pickerel-weed, *Pontederia cordata*, are easily established now in 3 to 10 ins depth of water in pools, after its little clustering, funnel-shaped pale violet flowers died down with the autumn foliage. It is hardy here and its rhizomes can be increased by division in spring or autumn, pegged down to keep fish from disturbing them.

Its close relative the large water-hyacinth, a notorious weed in Florida if welcomed here, is grown usually as a greenhouse plant, or outdoors until autumn, when it is brought indoors to winter at 45 deg F. It floats on its curiously inflated leaf-stalks, sending down roots where fish sometimes spawn.

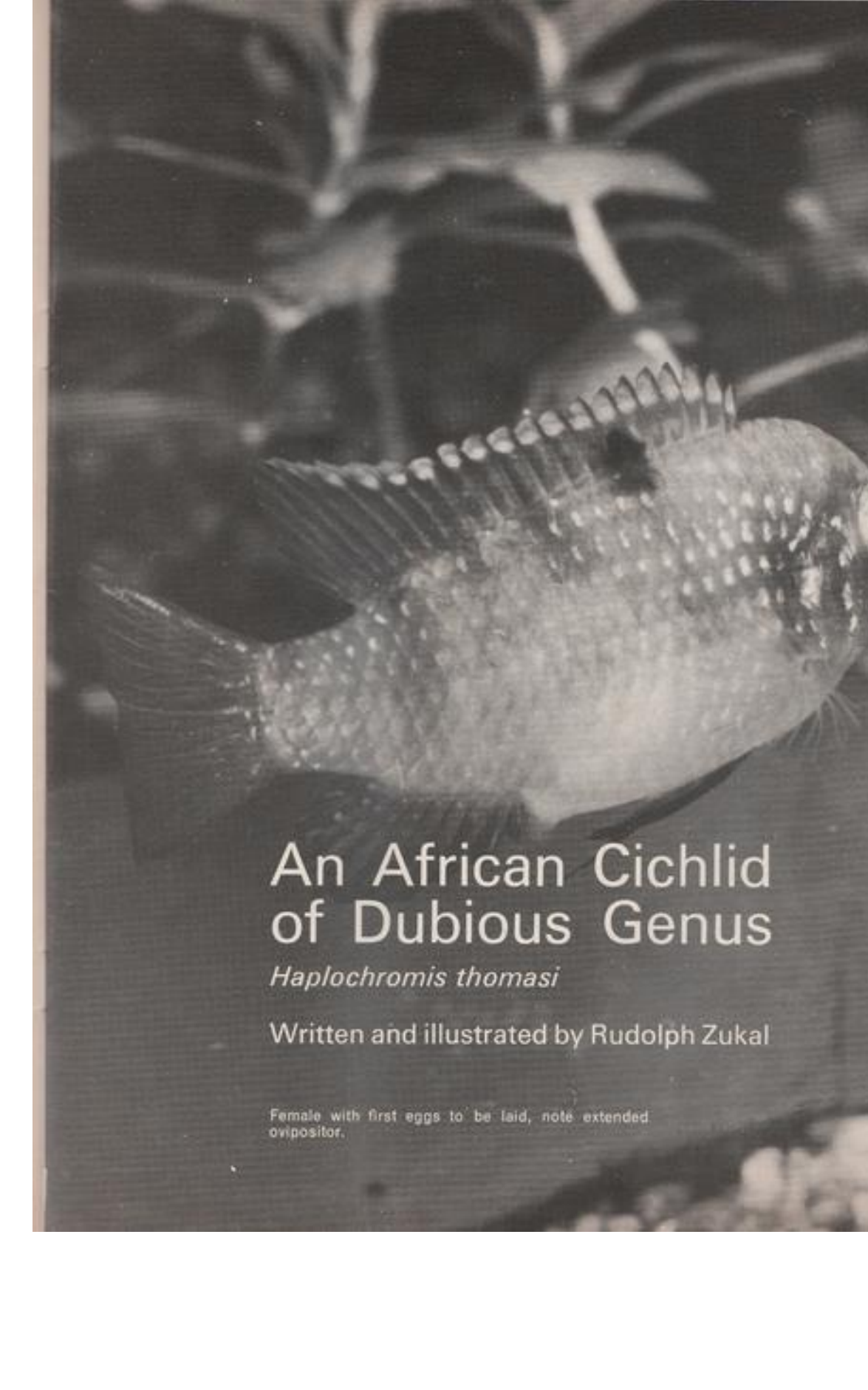
Beardless little Algerian iris can be planted in the pond-side rockery as an early gift to spring in the garden. After *Astilbes* die down, remove rooted offsets from outside their clumps and replant in humus in a new site, then top-dress in spring with leaf-mould and old manure. Many rampant pondside plants like bogbean, creeping jenny, arrowhead, water-solider and both loosestrifes may well need cutting back if they are not to grow out of control. Contributing to the tapestry of autumn colour by the garden pond are the large, lobed leaves in bronze and red on the umbrella-plant, *Peltiphyllum peltatum* which also likes its roots near water. Its great trunk-like rhizomes produce corymbs of pink flowers earlier in the year.

You may admire kingcups in May, but plant them now under a few inches of water. They luxuriate in part-shade and are highly polymorphic. Huge deep-coloured double flowers are borne on the monstrous *plena* variety of our native marsh-marigold. With plenty of room in the pond, oriental *polypetalus* can spread its large, showy 2 or 3 ins blooms as the best of all, followed by leaves 5 or 6 inches broad. Its hybrid with our native kingcup retains the latter's more compact growth. In contrast are the dwarfs I have seen flowering in November, and in January 1973—*nana plena* and *nana semiplena*, also *hortulanus* and white-flowered *rotundifolia* and *leptosepala*.

OSCAR

G. Robinson





An African Cichlid of Dubious Genus

Haplochromis thomasi

Written and illustrated by Rudolph Zikal

Female with first eggs to be laid, note extended
ovipositor.

WHEN I FIRST wrote about this fish some years ago, I accepted reluctantly that its name should be *Pelmatochromis*, as it was known then. Why? Because this beautiful African fish of the large family Cichlidae in no way resembles, either in its character or behaviour, species of the genus *Pelmatochromis*. In the meantime it has received the name *Haplochromis* and this too makes me rather unhappy. I am no scientist and certainly not qualified to put forward a suggested change of name, but I cannot help feeling that this newer name and the incorporation in this genus are unsuitable. But all this is by the way.

Although it was described by Boulenger as early as 1915, this small cichlid was caught by Mr. Roloff in 1962 in Sierra Leone in Africa and imported.

I am aware that there are, in Africa, species of the genera *Pelmatochromis*, *Pelvicachromis*, *Haplochromis* and many others, yet when I watched my *H. thomasi* in the community tank I could not help thinking that it could

not be anything else than a representative of the genus *Aequidens*. At that point I remembered my school-days when it was explained to me by the geography teacher that, many years in the past indeed, Africa was linked to South America by a land mass. So the thought occurred to me that perhaps certain species or even genera were present in both continents. Such was the idle speculation in my thoughts as I sat and observed my community tank. My beautiful cichlids were dispersed around the tank. After two days I observed that a pair of fish had isolated themselves from the rest and were guarding the tubifer container. Woe betide anyone who came too close. Even my hand was assailed. Adult *Cichlasoma spilargenteum*, *C. meschi* and *C. festivum* were driven away from the food. This behaviour pattern immediately reminded me of *Neomacara anomala*. Even the female *H. thomasi* took on threatening coloration, becoming darker and the lateral markings stood out clearly in her excitement. Comparing them further, I noticed that the fish did not seek out



Female completing
egg deposition



Male fertilising eggs

hiding places. As far as spawning behaviour was concerned, I learnt that their behaviour was very similar to the genus *Aequidens*. At no time did the fish turn themselves over so that the abdomen was uppermost, as is the case with the genus *Pelvicachromis* or species of mouth-breeders. No, the eggs were always deposited on a firm base below the fish, with the body in its normal position. There was one slight difference from the genus *Aequidens*. The pair of *H. thomasi* never spawned together. That is to say, they never turned at the same time over the stone and the eggs, but spawned individually. Whilst the female lays the eggs the male waits, and when she swims to one side he comes along and fertilises them. And so they take turns.

I have not aimed to come to any definite conclusions in this piece, but it should indicate to tropical fish enthusiasts that observation of our fish can be an interesting and reflective activity. Finally, if I may add a further point—the behaviour of the fish is not decisive in determining the genus or the species, but it is a guide.



Male guarding territory

Salvinia minima Bak.





—the smallest
water fern
by Karel Rataj

Illustrated by Rudolph Zukal

FLOATING PLANTS are a major problem for most aquarists. Normally it is difficult to grow them or, on the other hand, many species reproduce themselves so rapidly that the cultivator cannot get rid of them. In the second group belong the majority of small species. For example, duckweed (*Lemna*), the water fern, *Azolla* and the rootless duckweed (*Wolffia*). In cases where they reproduce too much, every disturbance of the tank results in the floating plants adhering to the submerged and high-standing plants. From here, after a few hours or even days, they float up to the surface again and quickly develop into new and abundant colonies. These tiny species, therefore, can not be recommended as suitable for home aquaria.

When it is necessary to cover the surface of the water with vegetation, for the purpose of creating a dense tangle of roots beneath the water for the benefit of certain species of fish, larger plants should be given preference. Such plants never sink and their growth can easily be controlled. They do not become a problem in the aquarium. For tanks with neutral or slightly alkaline water and a fair degree of light, frogbit is suitable. For tanks with acid water and a rather restricted amount of light the most suitable plant is the floating fern, *Ceratopteris*. Extremely widespread and resilient to the conditions of their surroundings are many species of the genus *Salvinia*.

This genus, together with the genus *Azolla*, belongs to the water ferns of the family *Salviniaaceae*. This family is distributed through the tropics of both the Old and the New World; only the species *Salvinia natans* reaches as far as the temperate zone of the northern hemisphere of the Old World. It is not really the most suitable plant

for the aquarium; nevertheless, it is the most commonly seen of this group because it is easily obtainable.

Plants of the genus *Salvinia* have thin, straight stems on which the leaves are arranged in a large number of whorls, each whorl consisting of three leaves. In each whorl there are two floating, roundish-ovate leaves, whereas the third leaf of the whorl points vertically downwards, being an aquatic leaf which serves the purpose of a root. This floating fern has no roots as such, then, and the leaves which reach into the water, offering an ideal hiding place for very small fish, are really leaves which have been specially adapted for taking in nutrients. The leaf whorls along the thin stems which float horizontally on the water form four regular rows of floating leaves and two rows of aquatic leaves. Vegetative reproduction takes place by division of the leaf-bearing stems. Individual pieces of stem break off and each piece develops into a separate floating island, which subsequently forms a compact, dark green carpet of plants covering the water surface.

As is the case with all ferns sexual reproduction is rather complicated and hardly ever occurs in the aquarium. A product of sexual reproduction are the so-called sporocarps. In most species they were unknown up until now and in the natural state too their formation is very rare. The genus *Salvinia* includes about eleven species which, given insufficient knowledge about their sporocarps, are put into four groups according to the form of their floating and aquatic leaves.

The first group includes the only species (*S. oblongifolia*) with leaves which are three to four times longer than broad. The second group has leaves two times longer than broad and consists of five species, including the well-known *Salvinia natans*. The third group includes three species, which have roundish leaves. In the fourth group are two species which have leaves which are broader than they are long.

Salvinia minima belongs to the third group. The leaves are set almost directly on the stems and so their petioles are only 1-2 mm long and so inconspicuous. In this it differs from the species *S. auriculata* and *S. radula* which have leaves on petioles which are 5-6 mm in length. In addition, the leaves of *S. minima* are only 0.6-0.9 mm in length, whereas the other species mentioned have leaves which are usually twice this length. On the upper side of the floating leaves are prominent hairs set in rows at an angle. The whitish-green undersides of the floating leaves are devoid of hairs. The submerged aquatic leaves resembling roots are divided into five or six 3-5 cm long segments. These project into the water and form a dense thicket of greyish-white or pinkish-white to brown "roots" between which young livebearers like to seek refuge. The islands of plants can be used for spawning by a wide variety of fish species or as an anchoring place for the nests built by labyrinth fishes. For this purpose the species *Salvinia natans* from the temperate zone cannot be used, of course, as they cannot withstand the high temperatures which are necessary for most fish species to spawn. By way of a contrast, *Salvinia minima* thrives

under temperatures of 20-32°C. It is equally demanding as far as the degree of humidity is concerned and flourishes in both uncovered as well as covered aquaria. It withstands fluctuations in the pH reading of the water and although it comes from southern Brazil (Santa Catharina) and belongs to the South-American biotope, it can be used without problems for creating shade in tanks with cryptococcyne in slightly acid water. Equally, it can be used alongside plants of the genus *Echinodorus* in tanks containing neutral or slightly alkaline water. Furthermore, it is an excellent plant in damp terraria, where it can be grown directly from sufficiently damp earth or peat. In such cases it often reproduces more quickly than in its floating form at the surface of the water. *Salvinia minima* has also, up until now, not been fully appreciated as a suitable plant for home palludaria, in which it quickly decorates the open expanses.

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SPOTLIGHT

Flagfin Angelfish

by Martin Haywood

Holacanthus trimaculatus Cuvier and Valenciennes.
Common names: Flagfin Angel,
Three-spot Angel.
Range: Tropical Indo-Pacific Oceans.
Max. length: Approx 10 inches.

THE FLAGFIN ANGEL is one of the most wide ranging of the Indo-Pacific angelfishes, being found as far apart as Taiwan in the East and Sri Lanka in the West. However, most specimens are obtained from the Philippines, where the species seems to be at its most abundant.

As can be seen from the accompanying photograph *H. trimaculatus* is one of the comparatively few almost solid-yellow fishes available to the marine aquarist, and considering that it can reach a length of nine inches or more, one of even fewer which may appeal to the large-fish specialist. Until fairly recently it was unusual to see many specimens below five or six inches long but of recent times many more smaller, down to only one inch, individuals have been exported from Manila.

Despite their hardness these beautiful fish are by no means amongst the most popular of marine angels with hobbyists—having to take a second or even third seat to the blue angels: Korans, Blue-rings and Emperors. Quite why this should be so is difficult to fathom as they are by no means the most expensive of fishes. Small specimens are comparable in price with some of the slightly rarer, dwarf angels. Perhaps when someone decides to further complicate their nomenclature

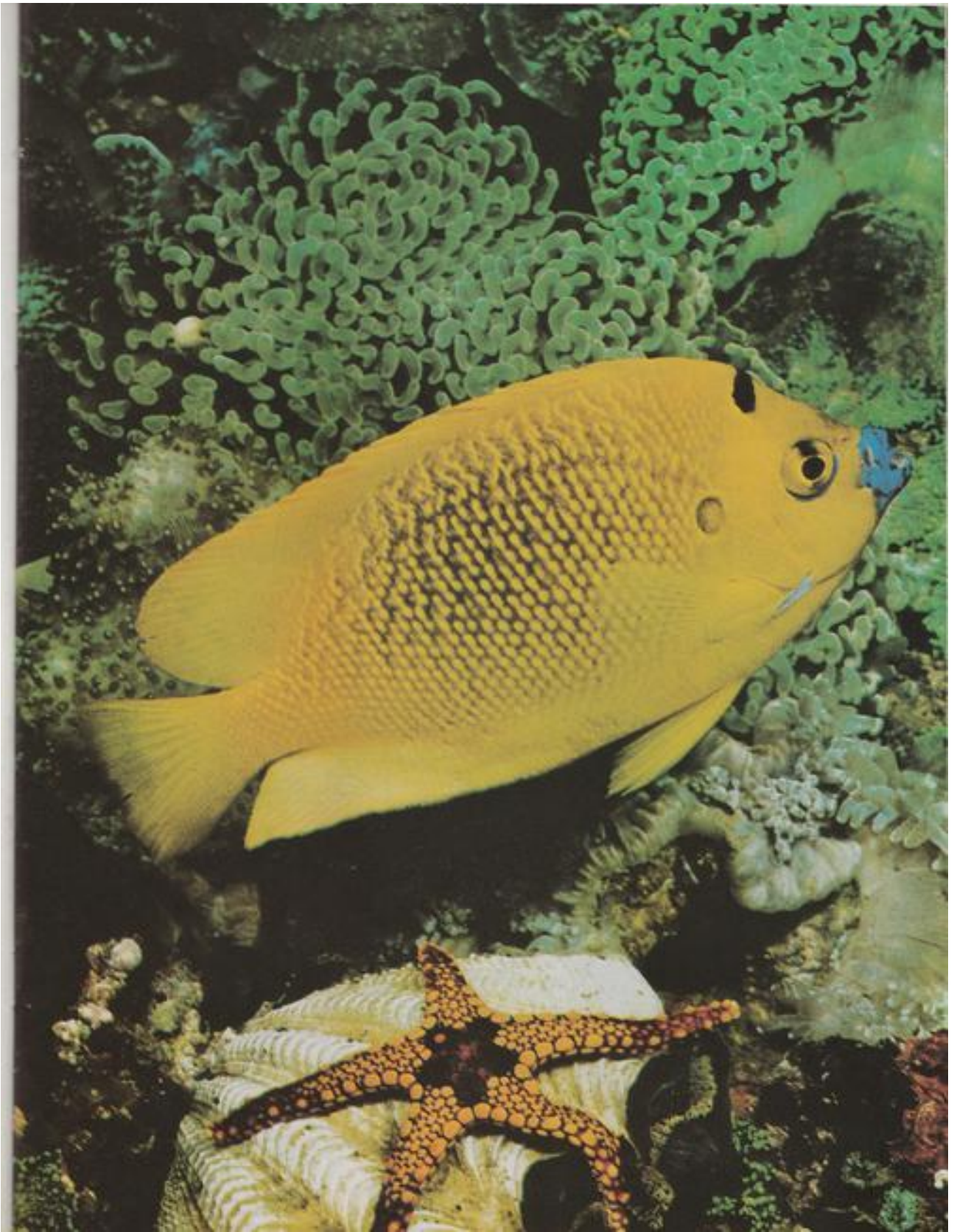
by making up a more glamorous common name they will become more popular.

Flagfins are among the most accommodating of angelfishes, particularly in their smaller sizes, and show little of the aggression which is all too common with some other *Holacanthus* species. Also they are much less hard on invertebrates although any decorative form of algae e.g. *Caulerpa*, *Halimeda*, is almost certain to suffer, as, like all the angels, Flagfins require and will eat a considerable quantity of vegetable matter. This is easily satisfied with frozen Marine-Algae or Tetra Conditioning Food and, in combination with a variety of shrimps and chopped shellfish, will form an adequate diet.

Like all angles, Flagfins appreciate and respond to good husbandry. They will not tolerate measurable ammonia or nitrite levels, high nitrate levels or other symptoms of bad water-management. Flagfins should be allowed a minimum of four gallons of water for every inch length, and the more the better. Decorate the tank with plenty of rockwork and the fish will soon overcome its initial shyness. It tends to be a truism that the more hiding places are available, to any marine fish, the more it will show itself. Knowing there is a bolt-hole within a few inches increases the fish's confidence. Conversely, give the fish only one rock to hide behind and that is precisely what it will do, almost all the time.

Suitable tank mates for Flagfins, which should be kept singly, include clowns, tangs, butterflies—ie fishes with which it will be able to compete for food.

To the best of my knowledge there is no visual means of sexing this species and no work has been done on captive breeding.





Net in hand i

Part 1

Anders W in South E

A Park in Kuching possesses one of the town's attractions—a small public aquarium featuring the island's commonest species, such as barbs and Gouramis.

THE AIRCRAFT CLIMBS STEEPLY and Singapore rapidly disappears beneath us. The last thing I see of the city is the thousands of cargo boats out in the lanes, awaiting their turn to berth and unload. The sea glitters below and our Malaysian captain announces that we will be landing in Kuching in just over an hour's time.

Kuching, with a population of about 200,000, is the capital of Sarawak, which is a part of Borneo belonging to Malaysia.

Forty-five minutes later we are flying in over Borneo, still at a relatively low altitude. I have to admit that I have really been looking forward to this journey with a certain amount of excitement. Borneo—one of the last unspoiled places in the world. The impenetrable jungle. The headhunters armed with the blowpipes that put fear into the hearts of Japanese soldiers during the last war. In addition to the impenetrable jungle and the headhunters, most travellers mention the numerous poisonous snakes, the voracious insects, the crocodiles, the leeches and the appalling heat. But I have always suspected that these writers tend to exaggerate the rigours of their journeys in order to heighten the reader's excitement and the image of their own intrepidity.

Borneo has the look of a moonscape. A compact jungle. Green-clad mountains sticking up like sugarloaves. There is still no sign of a road or a field. The solid greenery is broken only by the meandering rivers. I am to spend a week in the Sarawak jungle, living with headhunters, Iban, and at the same time exploring the aquatic life of the river. This has been made possible by contacts in Singapore who laid on a guide—a Mongolian who lives in Kuching, knows the Iban and can take us to them. He will be meeting us at the airport.

We are flying low now and the jungle opens out in

front of us. We can see a number of small houses—though they are more like sheds on piles. And then we touch down.

Passing through customs without much difficulty, we catch sight of our guide. He smiles, as the Chinese mostly do, and asks us to accompany him. He speaks intelligible English and is evidently about 35 years old. He drives us to one of the two hotels in town and says that he will collect us early next morning.

The seasons here vary from one region to another, in spite of the comparatively short distances. We are now in the middle of July, and it is summer in Borneo. Thailand, on the other hand, which is not more than two-and-a-half hours flying time from Borneo, has now entered its winter or rainy season, while Singapore, which is just over an hour away from Borneo by air, has more or less the same climate all the year round.

The hotel is right on top of the river, which is perhaps 500 metres across. Barges laden with merchandise pass by in a steady stream, showing both the Malaysian and the Sarawak flags. Many of them are armed with a heavy machine gun or some sort of light artillery. Later the guide explains that this is on account of the piracy which occurs along the coast. Five large birds of prey can be seen gliding above the river. "Eagle," says one of the boys from the hotel who has picked up a smattering of English, and he points smilingly upwards. No doubt he is right. I fall asleep early this evening to the subdued buzz of the air conditioning.

Next morning we are picked up by our guide, whose name by the way is Thomas Goh, in a fairly new Ford outside the hotel. He proudly informs us that the car is equipped with air conditioning but that this cannot be used when the outdoor temperature gets too high;

n Borneo

ckman
st Asia



otherwise the difference between the indoor and outdoor temperatures will crackle the windscreen.

We are now driving along a tarmac road passing through low-lying country. Here and there we see grey, shed-like houses on piles two metres off the ground.

Then the tarmac comes to an end and we continue along a potholed gravel road. The country is still flat, but the green sugar-loaf mountains are coming closer. Here and there we see a clearing where somebody grows pepper. We stop for a break at a shed beside the road where we meet a Chinese who offers us tea. The rest of the family are working in the pepper plantation. I am told that the difference between black and white pepper is a matter of how you dry the peppercorns.

We have now been driving along this substandard highway for five hours, and Thomas has had to turn off the air conditioning for the reason already given, with the result that the heat inside the car is quite suffocating.

We pass by one or two watercourses, but unfortunately I do not have time to study them closely. I shall have to concentrate my attention on the river in the headhunters' country. The aquaristic gear I have with me comprises DH and pH gauges, a thermometer and a battery-driven air pump which I have found invaluable on a previous occasion. I also have a couple of nets—an ordinary fine-meshed landing net and my largest aquarium net. One thing I have learned is that there is little point in carrying fishing tackle; much better to rely on the equipment used by the local population. I have also brought my camera and a small photographic aquarium. The latter is important, for as there is no prospect of taking any fish back with me I have to photograph them on the spot. In fact the powerful lighting conditions prevailing here make for quite decent pictures. The rest of my luggage

Due to the strong light required to photograph fish in aquaria, the stones were burning hot, causing acute discomfort.



A wherryman will take you across the broad river which flows through Kuching.

has been kept down to bare essentials.

The car is now juddering and bouncing along a road which hardly merits the name. We stop at a small village and are soon surrounded by curious and friendly onlookers. This is as far as we can get with the car. Below the houses I catch my first view of the River Skrang, and I also spot a number of canoes. Beside the houses I discover an expanse of water about 50 metres in diameter. While Thomas is busily drawing up a



plan of campaign with the two canoeists who are to take us up river, I decide to take a closer look at this water. I find that it is quite shallow, only about half a metre deep. The water is quite clear, with a brownish tinge. Dipping my finger into it, I can tell that the temperature must be about 104°F. At the other end of the pond I can see a manure heap, and then I begin to understand the brownish colour of the water. I can easily guess the approximate pH and I am sure that no fish could survive in this water. But I am wrong. Just as I am getting up I see several, the biggest of them certainly seven centimetres long. Odd. The last time I saw this fish was in the *Alang* or canals of Bangkok, in very brackish water, a Malayan Halfbeak (*Dermogerys pusillus*). You do not spot them right away, because they remain stock still near the surface of the water, lying in wait for insects, often close to a blade of grass floating on the surface. I take a picture before returning to the others, who are down by the shore loading up the canoes, surrounded by people who have come to wave us off, as well as dogs and countless chicken and pigs.

The canoe is ten metres long, very narrow and flat-bottomed. It is a typical native craft, though the stern has been altered and fitted with an outboard motor. It is steered from the stern, but there is also a steering paddle in the prow for strong currents and rapids.

The river is broad here—about 75 metres. The water is 79°F and none too clear. I hope it will get clearer as we work our way further up.

The canoe gathers speed and we move up river at a speed of about 15 knots. The water level is at its lowest at this time of year. Thomas tells me that during the rainy season it rises three or four metres and flows at such a speed that navigation becomes deadly dangerous.

The river meanders back and forth. Every now and again we pass canoes with entire families on board. The vegetation on the banks becomes increasingly dense and the banks themselves grow steeper and steeper. The river is the only possible highway in these parts. The people we meet laugh, wave and point at our outboard motor, which attracts more and more attention as we advance further up the river. We now notice that the water has grown shallower, and we are no longer travelling as quickly as before, because the current is getting stronger all the time. The water is clearer too, and slightly cooler.

We stop for a break at the same time as we replace a cotter in the propeller, which has struck a stone. Thomas gets out chicken and rice. We must reach the Longhouse before darkness descends. It is a fantastic journey in natural surroundings which I could hardly have dreamed of. We can hear birds in the trees around us, but we cannot see them, except for the lovely kingfisher, which is a common bird here. Sometimes the trees grow right over the river, forming great rooms for us to pass through. Now and again I see small tributaries, or rather streams flowing into the river.

The water is now rushing and foaming about us, and sometimes it is no more than a couple of decimetres deep. Bang! There goes another propeller cotter. We

stop and pull the canoe into the shore. Resuming our journey, we either punt our way forward or else get out and pull the canoe along at the points where the rapids are strongest. The river bed makes easy walking because it consists mainly of rounded pebbles.

At the height of our exertions we catch sight of some children walking along the bank. The Longhouse cannot be far away now. We have to keep going for another hour, because I have asked for us to be taken as far up river as possible. Thomas is a bit worried. The water level is lower than expected, with the result that we are making slow progress. We are having to drag and pull the boat along more and more often, with the water swirling about our legs. The prow must be kept into the current all the time. The slightest deviation and the current would take hold of the canoe and turn it over in a split second.

Thomas says: "If we don't get there soon, we'll have to camp on the shore". At that very moment we see a few Ibans in canoes, and Thomas says, "Here it is". We glide in to the shore. Evidently the evening ablutions are in progress, because all around us we see women and children from the village washing themselves. They all look at us and laugh, and Thomas explains himself in Ibanese. It is already dusk as we carry our gear up towards the Longhouse with the Ibans close on our heels. The men are dressed in a short sarong or a pair of short trousers, while the women wear a long sarong which looks for all the world like an evening skirt. Otherwise they are not wearing anything at all, and we stare at them just as much as they stare at us.

The Longhouse stands on piles five metres high and one enters it by way of a long staircase made of tree-trunks placed lengthwise and with steps cut into them. This is an awkward balancing act for the novice.

The Longhouse is the home of a community of fifteen families. Each family has its own sleeping quarters and a kitchen and fireplace, but half the building is given over to a long communal "living room" measuring about 15 by 75 metres. We walk through half this communal room, carefully negotiating the bamboo floor on account of the wide chinks between the bamboo canes. We are to stay with the chief's son and his family, and their position is in the middle of the Longhouse.

Thomas Goh has briefed us with a few simple rules of conduct. First and foremost we must greet the chief and his family. We must always accept what the chief offers us, be it home-made rice brandy or roasted cockroaches. And we should smile as frequently as we are able, because an angry or worried mien is regarded by the Ibans as an evil omen and must therefore be avoided.

First of all we pay our respects to the chief. His torso and arms are tattooed all over. Then we are taken to his two sons and their families, whose guests we are to be. Eventually we are each given a raffia mat to spread out on the bamboo floor. Looking down through the wide chinks in the floor I can see the pigs in the process of huddling together for the night, together with the chicken.

It is almost dark now, and most of the Ibans are sitting in the "living room", the men chatting and drinking rice brandy while the women plait baskets and raffia mats. The children sit listening to the conversation of the adults, or else they tumble about in between the numerous dogs. The men's fighting cocks set up a frightful commotion every now and again. They are all tied down, and they appear to be greatly prized.

Stretching out on the bamboo floor I try to get off to sleep. On one side of me I have the chief's eldest son, plus wife and children. On the other side are the chief's youngest son and his wife and children. It is almost dark indoors. Beneath me the pigs are still grubbing around, getting comfortable for the night. I turn on my torch to look for something I can use as a pillow. I could have saved myself the trouble. Over ten large brown cockroaches, intimidated by the beam of light, rush for sanctuary underneath my mat.

I turn off the torch and try to forget what I have seen, concentrating instead on the possibilities of getting hold of one or more exciting fish species in the river next day.

I awake slowly to all the novel sounds of pigs, roosters and dogs. As I open my eyes and peer towards the light coming from the hole in the roof, I discover five small Ibans between the ages of two and seven sitting round about and looking at us. The day's work in the Longhouse began a long time ago, and clearly most of the men have already disappeared into the jungle on assignments of various kinds, leaving the children, women and old men at home.

I assemble our gear and ask Thomas to borrow a small canoe so that we can make our way to a suitable point along the river. I have to admit that I am very excited about what I may possibly find in the river. Many of our most popular aquarium fish come from these parts—the tiger barb, the mosaic gourami, the spiny eel and the splendid clown loach, for example. Most species, however, inhabit much calmer waters than those we are now visiting. What will I find this time? If indeed I find anything at all in this turbulent water. The excitement is just the same every time I come to a new watercourse. Finding an old acquaintance like the tiger barb or the mosaic gourami and watching and investigating the biotope in which it lives and thrives is just as much fun to me as discovering a new species.

Slowly we make our way upstream. It is so incredibly beautiful here that I almost have to pinch myself. The river cools its surroundings and makes the climate as pleasant as a summer's day. When I dip the thermometer into the water rushing past us it reads 75°F. The water is crystal clear and tastes fresh. The pH gauge gives a reading of 7.0. This is confirmed by a second reading. No acid water here. We ask Thomas to put us ashore on a reach of smooth pebbles which will make an excellent starting point, and we agree that he will come and collect us before it gets dark. Placing our gear in the shade of an old log one metre thick, I take the net in one hand and venture into the shallow part of the river where the current is fastest. The undertow is terrific. Although

the water does not even reach halfway up to my knees, it feels as though the river will have me off my feet at any minute.

And so, one fine morning in July, there I am at my destination, net in hand, in the heart of Borneo's mountainous jungle.

I look down into the swirling, crystal clear water. Where I am standing it is perhaps 30 centimetres deep. The river bed is covered by those beautiful smooth pebbles. There is no sand and, of course, no vegetation. If there are fish in the river, they should be close to the shore, where the water is calmer.

Suddenly I feel something moving on my foot. Leaning over carefully I see that it is a Flying Fox (*Epalaeorhynchus kalopterus*), inquiringly "crazing" its way along. Soon it is joined by others, easily distinguished by their shining band of gold. Round my feet I can see a shoal of thirty or forty. They do not swim so much as suck themselves along with their mouths. Sometimes they change stones, which they do with the speed of lightning so as to avoid getting carried off by the current. I stand still looking at them for a long time before cautiously lowering my net. It is a stout aquarium net, but it is immediately bent straight backwards by the rushing water. So now I know that this net is only serviceable in aquaria or quiet creeks. Then I turn it upside down and carefully poke some of my companions. Oddly enough they are unperturbed and do not move more than a decimetre or so away. I imagine that, given the right sort of net, they would be easy to catch.

The sun begins to burn my head, and I decide to return to the shore, if only to don my sun hat. The net is no good anyway, so there can be no question of doing any fishing until I get hold of a better one. My large angling net would not withstand the pressure either.

The sun is now at its zenith, and walking over the stones on the shore is like treading on coals. Above the roar of the river a host of different sounds can be heard from the jungle. There is the raucous birdsong, but I can also distinguish other noises which presumably come from a flock of monkeys. You cannot see them, but they are there all right. Gaudy butterflies flit across the shore. They are in fact the only insects I have seen so far, except for the cockroaches in the Longhouse.

This is one of the most beautiful places I have ever seen. The jungle rises like a steep wall only a few metres from the shore and appears to be quite impenetrable.

It is hot and I decide to cool off by going for a swim in the river a short distance away, at a point where it is wider and seems calmer. Added to which it is deep enough for swimming to be possible.

I ought to have been more careful. The calm surface of the water is deceptive. I am carried out into midstream at a tremendous speed. I try to swim back again, but I cannot. I am simply washed away; quickly, I try once more to get out of the current, unsuccessfully, and I began to despair. Further ahead I see a liana hanging down into the water. I come close enough to grab hold of it and halt my mad career, but only for an



The Borneo version of the Halfbeak is relatively colourful and has a much larger and stouter lower mandible than we are accustomed to seeing.

instant. The liana breaks somewhere up in the treetop and falls down on top of me, at the very moment when my foot strikes painfully against a rock beneath the water. The river now turns a bend and the water becomes a little calmer. Summoning my remaining strength I manage to get out of the current and eventually regain the shore, quite some distance from the point at which I entered the water. Limping back with my foot bleeding slightly, I vow to choose a safer bathing point next time.

After plastering my foot, I walk along the shore, net in hand, towards the calmer portion of the river. Suddenly I see a pool measuring about ten square metres which has been formed to one side of the river. The water here is calm and fresh water is constantly being supplied to the little pond from the river. It is half a metre deep at most. Full of curiosity I lean over the surface of the water, and the first thing I catch sight of is a Malayan Halfbeak. There are specimens of all sizes up to about seven centimetres. I have now come across this fish in three different biotopes. First I saw it in the brackish water of the canals of Bangkok. Then I saw it in the lowlands of Borneo, in acid and very warm water. And now it is in a crystal clear river with a pH of 7.0 and a temperature of 75°F. The adults have a blue and red sheen and their lower mandible is a good deal longer and heavier than in the species we are accustomed to see in the shops. A rapid sortie with the net, and I manage to get hold of a few specimens which I transfer to my bucket. They are quite easy to catch because instead of hiding they just move a few decimetres away. Their natural enemy here is the kingfisher, which is very common beside the river. I have already seen several. They are incredibly swift divers.

I return with my catch to the old log where I have left my gear in the shade, and I get out the photographic aquarium and my camera. I place the aquarium with the Malayan Halfbeak out on the stones, in the sunlight. It is a fine specimen. The light is powerful and the

light meter gives good readings.

I return once more to the pond because there may be other species there. And sure enough, almost immediately I spot a gourami which I am able to catch without the least difficulty. It would seem by all accounts to be *Ophronemus garamy*, a species which can grow to quite a considerable size. Then I spot a shining silver fish which resembles a splendid barb, although its body is smaller. After a short chase I manage to trap it and transfer it to my bucket. It is about five centimetres long.

Suddenly I discover some gorgeous barbs swimming towards me from the other side of the pond. They have red fins and black broken lines along a silver-yellow body. The biggest of them is perhaps eight centimetres long. They are beautiful to look at, and their bodies sparkle as they emerge from the shaded part of the water into the sunlight. I capture a fine specimen which I recognise as a none too common aquarium fish called the Hard-lipped Barb (*Osteochilus hasselti*).

I return to the photographic aquarium with my latest discovery. Leaving the bucket in the shade, I turn on the air pump for a while.

I have just got into position on my stomach on the hot stones to photograph the small silvery barb when the chief's son comes walking over to me. His name is Ngaoh ak Unteng and he is 21 and the father of two children, with a third due to arrive very soon. He is very amused by our carryings on and bends down to take a close look at the small barb in the aquarium. Getting up again he explains, by means of sign language, that this is the largest fish in the river. Fully grown it is almost one metre in length and is considered quite a delicacy. It is hunted at night-time with harpoons.

I return to the bucket to collect *Osteochilus hasselti*, only to find that it has jumped out and landed on a stone nearby. Since it cannot be revived I have to rest content with photographing it as it lies. Can't be helped.

The Pond - After the Saga

by Roy Pinks

HAVING MORE OR LESS successfully negotiated the repair and restocking of my Plastolene pools, I began to consider to what extent I could enlarge my range of native fish without putting at risk the Sarasa Comets, with which I was rapidly becoming besotted. These latter, so attractive and fresh looking, and reasonably lively with it, are one of the better things to have emerged from the innovatoes in recent times, and I am sure that they have come to stay. I hope, for the benefit of future pond-keepers, that the vogue for these and for koi will not edge out the common goldfish. I sounded a caution about this a year ago, and note with some regret that the larger



goldfish are almost unobtainable now, their places having been taken in the dealers' pools with larger and larger and vastly expensive koi, which are being pushed by the less straightforward members of the trade as being quite suitable for association with other fish. I would as soon put perch in my pool as koi!

My large shoal of tiny golden orfe maintained its numbers and the fish put on size. It may be recalled that I planned a season using Phillips Pool Pellets exclusively, as I was somewhat perturbed at reports I had read that the like had caused obesity and excessive growth in pool fish, many of which had outstripped the holding capacity of their artificial surroundings, and had subsequently perished. The comparison between native and "artificial" fish on such a diet promised to be interesting.

The average pondkeeper is brought up sharply when he tries to improve on his usual initial selection of goldfish and golden orfe. Now and then the silver orfe becomes available, but usually at a price which reflects its scarcity value rather than its attractiveness in the pool, so it tends to end up with the connoisseurs rather than the general buyer. Tench, so attractive in the shop, both in normal and golden form, seldom are seen again in the deeper or larger pool, and are best reserved for the indoor aquarium, where their very considerable beauty can be appreciated by their many admirers.

For much the same reason the charming little gudgeon, mainly a bottom dweller, is likely to take a background rôle in most ponds, much as its antics amuse when seen close to. The crucian carp just occasionally appears in the dealer's tank, and may be bought with some confidence because it has some beguiling red, green and blue hues which put new life into the old soul when the sun slants down at the right angle and turns this outwardly dull customer into one of nature's rarer beauties. This carp, unlike some of its relations, swims in mid water and is more to be seen than some would believe. As it is not a mud stirrer it may be regarded as being on a par in the social scale with the common goldfish, whose habits are pretty well impeccable: biting off bits of plant is no great crime, by the way, as there is usually too much overgrowth in the summer months, anyway. By comparison, koi are the worst sort of vandals and should be catered for as such. Incidentally, I am always impressed with the frankness with which the real specialists in koi treat such conduct—it is a highly responsible attitude in which sentiment is subordinate to reason—and it is in stark

comparison with the commercial pushers of many wild things, whose bad habits are concealed in deference to increased sales.

Most of the other carp are of doubtful value in the garden pool, so I ignored them for my collection. Unfortunately, some crucians I had mentally reserved were sold out when I went to collect them, so this species will have to wait another season.

We are rather left, therefore, with our native surface-swimming fish like roach, rudd, dace, bleak and the like: even if they are not of outstanding colouring, at least they are constantly active, vying with the orfe for unwary flies, and for floating artificial food. Rudd also appear in a golden form, which I have found to be extremely variable both in shade and extent: these are such quietly lovely fish that they come high on the shopping list. All the fish in this paragraph will tend to grow to the sort of size the pool allows, nine inches being about the average. Rudd and roach present particularly attractive colourations under certain elevations of the sun, and can be unbelievably beautiful. The rudd's decidedly red finnage come across outstandingly, and I am always on the lookout for likely specimens. I paid a late season visit to the Severnvale Garden Centre near Bristol, in which Mr Trego maintains a considerable and interesting aquatic centre.

A tank of plump and lively rudd, probably fresh from the river, really delighted me, and I settled for half a dozen. I was somewhat uncertain whether it was a wise move to transfer such fish, which were under cover, to an outside pool at that time of the year, but I accepted his counsel that since my pool water was still warm from the summer the transfer should prove satisfactory. He was quite right. The fish were obviously on top form, accepting worms while still in the floating plastic container which I placed in the pool for a few hours, enabling temperatures to equalize. On release, they quickly formed a shoal and moved around purposefully with the juvenile orfe as outriders—a very pleasing sight indeed.

Later still I managed to track down some golden rudd, but these were mere two inch specimens, and were dwarfed by the other fish in the pond—even the young orfe had grown unnoticed, and were no longer at the end of the pecking line. The only other candidates for this pool were minnows, and I will comment on these separately. At any rate, for my purposes and tastes, the complement was about right, and I was entitled to hope that the following season might well prove interesting.



Coldwater Jottings

by Frank W. Orme

EACH YEAR I net the frog spawn from the ornamental pool and place it in a water-filled fibreglass tank. There it hatches, and the tadpoles eventually become small frogs and make their way into the wide world. Where they disappear to I have no idea, although a few find their way back into the original pool; however, it is hoped that many of the tiny creatures survive to help redress the falling frog population. The continuous expansion of urban, and other developments into the countryside together with the infilling of natural ponds is depriving both the frog and other life-forms of their natural breeding habitats. Although the few frogs that are raised in my garden may have little effect in the long term, they, nevertheless, help in some degree to slow the rate of decline.

Recently I was amused by a visitor who, it seemed, was more interested in the tadpoles than in the fish. He could not understand why anyone should intentionally raise frogs which, he said, would end up in the main pool and, when they grew large enough, would "eat the fish." This was a belief that I had not heard before. When I enquired whether he had actually seen a frog eating a fish he admitted that he had not; he agreed that the fishes in my pool did not appear to have been harmed, despite the large number of adult frogs that could be seen. After some further conversation my visitor finally decided that perhaps he was wrong and the frog was not the villain he had believed. In future, I was assured, he would also hatch the spawn instead of destroying it, and the adult frogs would no longer be caught and removed to a stream that lay some distance away. Provided their number did not increase too much they would be allowed to share his pool with the fishes.

What I found surprising was the fact that this belief was

held by a man who was a very keen angler and who, I would have thought, should have known better. I was pleased that I was able to convince him that our common frog was not a "fish-eater" and was quite harmless. Perhaps in future years he will also raise a few small frogs, thus contributing a little to the conservation of this amphibian.

End of season cull

This is the time of the year when, if it has not already been attended to, the final sorting of young coldwater fishes should be made. This end of season cull is particularly important where young fancy goldfish are concerned, for only the best should be retained if the stock is to be improved in subsequent years. To develop fully, all coldwater fishes need plenty of growing space, and this final reduction in numbers will help to reduce any possible crowding in the tanks or pools which would retard the rate of growth.

The young fishes need to make as much growth as possible before the onset of the colder temperatures; they also need to be accustomed to fluctuating temperatures, therefore if any heat is still being applied to the water it should now be discontinued. The aim of the breeder of coldwater fishes should be to produce healthy, well-grown hardy youngsters of the best quality possible from the available adults. Too often the novice attempts to raise too many young fishes in too little space. This usually results in a large number of undersized runts of indifferent quality which will be of little use in any future breeding programme. However, the sensible aquarist will realise that from the young only one, or perhaps two, of each sex are required, and from six fishes there is a good chance that at least one pair of reasonable potential will be found—so why not concentrate upon raising just a few of the better young? Of course, if regular cullings have been made throughout the season, as they should have been, it will be an easy task to decide which of the remaining few to keep.

Inept angling

Can anglers really enjoy hooking fish when no skill is involved? During last June a national daily newspaper carried a story which reported that a former trout hatchery—Church Pond, in the Midlands—was being overstocked to such an extent that fish could be caught by "even the most inept angler."

After the fish has been hooked it is returned to a nearby stock-pond to recuperate before being returned to the lake. During their rest period "fresh stocks will be introduced to follow the same routine" so that there is always a "vast number of fish".

It was stated that "if a fish is hooked three times in a week it takes a long time before it can be tempted again (I wonder why?) but by allowing the fish time to recover they should start feeding again when released."

The 11-acre lake has been stocked with carp, trout, perch, bream, roach, tench and pike, and has "superb landing stages for the comfort of visitors." Although visitors may enjoy the "sport" I doubt if the captive fish

appreciate the part which they have to play—and, somehow doubt if real anglers would get pleasure in catching fish like picking apples off a tree.

Death of Societies

It continues to puzzle me why, despite the growing number of coldwater fishkeepers, there are not more societies devoted to this side of the hobby. For years the goldfish has attracted numerous enthusiasts but only in certain areas of the country have they established themselves into organised groups. Koi societies are also few, however, this is offset by the British Koi-Keepers Society which has sections meeting in many parts of the country—which could be looked upon as local area societies. Apart from the B.K.K.S., so far as I am aware, there are only two other Koi societies—the Yorkshire Koi Society and the Midland Koi Association (Although there is also a U.K. chapter of the Zen Nippon Airinkai, which is a branch of the Japanese Koi Society). Goldfish enthusiasts are catered for by only five societies: the Goldfish Society of Great Britain; The Ranchu Society; Bristol Aquarist's Society; Association of Midland Goldfish Keepers and the Northern Goldfish and Pondkeepers Society. There is a group known as the South Park Aquatic (Study) Society which meets in Wimbledon, and caters for all coldwater interests.

When it is considered that keeping coldwater fish as a hobby was well established long before the tropical fish became so popular, it does seem strange that so few coldwater societies exist. Is it that many enthusiasts of the coldwater fish are too independent to band together—or merely too lazy? However, for those who would like to join a society, and live near enough, the following addresses may be of interest.

British Koi-Keepers Society: Membership Secretary, 'Woodlands', South Avenue, Langdon Hills, Basildon, Essex.

Yorkshire Koi Society: Mrs. B. Hoyland, 2 Herrick Road, Barnby Dun, Doncaster.

Midland Koi Association: Mr. S. Carey, 49 Conway Avenue, Tile Hill, Coventry.

Zen Nippon Airinkai: PO Box 30, Windsor Street, Uxbridge, Middlesex.

Goldfish Society of Great Britain: Mr. A. C. Law, 'Bracken' 4 Elgin Crescent, Caterham, Surrey.

Bristol Aquarist's Society: Mr. V. Cole, 10 Hardwick Close, Brislington, Bristol.

Association of Midland Goldfish Keepers: Miss G. Kedge, 6 Dean Gate Drive, Houghton-on-the-Hill, Leicestershire.

Northern Goldfish and Pondkeepers Society: Mrs. P. Hodgkinson, 9 Stratford Close, Off Plodder Lane, Farnworth, Bolton, Lancashire.

Ranchu Society: Mrs. E. Davidson, 14 Garnets, Takeley, Bishops Stortford, Hertfordshire.

South Park Aquatic (Study) Society: Mrs. M. Dudley, 163 South Park Road, Wimbledon, London.

If there should be any societies which I have not mentioned please let me know, c/o The Aquarist.

Book Review

Caseless Caddis Larvae of the British Isles. By J. M. Edington and A. G. Hildrew. Freshwater Biological Association Scientific Publications 43. (£3.00).

The youngest aquarists know of caddis-flies, and their intricate cases dredged up when one collects from a pond or stream. Few, however, realize that many caddis, 47 in Britain, do not live in transportable cases. A few of these make cases only in their later stages; some collect their food with the aid of silk filter-nets in still waters, others are free-ranging predators in faster streams and some live in galleries constructed on the surface of stones. Various keys exist to identify adult caddis-flies, but the larvae, much used by anglers for bait, were a problem. This addition to a well respected series of guides fills the gap with not only a well-illustrated key, but its 92 pages include notes on their classification, ecological distribution and feeding behaviour. Larvae of *Hydropsyche* eat bullhead fish eggs.

Three species not found in Britain since the beginning of the century have never had their larvae described, more likely from the limited number of workers on these insects than from extinction for there isn't enough information to produce adequate distribution maps. Most rivers have a downstream distribution of certain families adapted to varying water-speed, river-bed or food-supply; but pollution has driven some from the lower Thames and other waters.

Some larvae rubbing minute scrapers on their front legs underneath the head produce a sound, even ultrasonic, to repel intruders from their filter-nets and space out their territories. Some fully developed larvae construct stony pupal cases which might be confused with larvae cases of well-known case-bearing caddis. Some, not all, are caught by light-traps, others by emergence-traps. A few fly every month of the year excepting mid-winter. A few have a life-cycle spanning 2 years, most in one year. A fascinating group of aquatic insects, and a much-needed book to understand them.

ERIC HARDY

PONDS AND WATER GARDENS by Bill Heritage, published by Blandford Press Ltd., Poole, Dorset @ £4.95.

This book is the best value for money which has come the reviewer's way for a long time. It is handsomely illustrated in colour and monochrome, the colour plates being of the highest quality and accurately portraying the colourful blooms of pond and pondside plants. Especially mouth-watering are the thirty to forty plates depicting water lily varieties, such a gallery of portraits of these lovely blooms being a rare ingredient of books on water gardening.

Continued on page 59

WHAT IS YOUR OPINION?



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

STEVEN WOODHAM is 14 years old and he lives at 651 Blandford Road, Upton, Poole, Dorset. He says: "Thank you for printing my letter about blue lobsters in the May issue of *The Aquarist*: Unfortunately, since writing the letter, the female has died. There were no signs of disease so I assume that she died of old age. The male seems quite healthy and has shed his 'skeleton' again. In the March *W.V.O.* I saw a letter about sucking loaches. In my community tank I had a small sucking loach of about 1½-2 in. in length. Amongst other fishes were three angels. One was an ordinary angel, which was fully grown, and the other two were half-grown blushing angels. There was also a large pair of blue gouramies.

"One day, while watching the fishes, I saw the loach sucking the sides of the large angel. There was no damage to the fish so I left them together. Later on I saw that the male gourami had lots of red marks on his sides, and the loach was attacking him. I removed the loach to another tank where it behaves itself reasonably well. The gourami died a few hours later. The loach never touched the female gourami or the two blushing angels. Soon I am hoping to use a 36 in. × 12 in. × 12 in. tank for keeping gouramies in. How many pairs do you think I can keep in a tank of this size; and what sort would you recommend? P.S. I think it is a good idea to print readers' letters and quotations in bold type. About two weeks ago I bought a fountain plant.

It doesn't seem to be doing much at all; but when it has settled I hope it will grow. I will keep you informed of its progress." (You could keep a variety of different gouramies in your 36 in. tank, the number depending upon the size of the fishes bought, i.e. whether young or adult. It's usually more interesting to buy young fish so that you can watch them grow to maturity. Gouramies that appeal to me include the three-spot, the thick-lipped, the opaline, the pearl, the chocolate, the golden, the dwarf and the honey. Your local dealer is the man to advise you. B.W.)

No. 3 Inglewood, Vale Road, St. Sampsons, Guernsey, heads the letter I received from Mr. J. Rogers. "I wonder if you could throw any light on the following," he says. "I have two tanks, both of which are virtually new replacements. One is a 48 in. community tank and the other a 24 in. tank used for breeding and for rearing fry. Both are lit by Gro-Lux tubes which are on at different times but for the same amount of time daily. The gravel and stones have been boiled and all the weed is from the same source. In the small tank I have algae growing; but there are none in the large tank. The only difference is really that in my large tank I have installed a power filter—a Sicce 42—which has been in since the tank was set up. There is no sign of algae in this tank. Could it be that the water flow prevents any algae spores from settling? Have any other readers noticed this difference?" (You do not state the wattage of the tubes used over each tank or the length of time for which they are lit. Perhaps the smaller tank is receiving, too much light, i.e. intensity and/or duration. Perhaps it's as simple as two flowerbeds, one sprouting weeds because seeds blew or got carried into it; and the other free of weeds because no seeds happened to land in it. Try cutting down the amount of light reaching the smaller tank. Perhaps the power filter keeps the water much cleaner and, hence, keeps down the proportion of dissolved mineral salts available as food for algae. B.W.)

Mr. Ernest Peacock resides at 20 Rychill Grove, Preston Road, Hull, E. Yorkshire, and he writes: "I wish to let you know about a vibrator pump I purchased four years ago. The make is Petcraft model 4405. I feel that this pump deserves praise. The pump has been running non-stop for almost four years. I have never had to repair or maintain the pump. I believe this is worth telling other people about, especially as it was low priced and good value for money."

Mr. Michael Wiggins wrote to me from East House, Whalton, Morpeth, Northumberland, and said: "... I noticed that you wanted some opinions on breeding large cichlids and thought this would be the ideal opportunity. About three years ago I purchased two young oscars, *Astronotus ocellatus*, taking the risk that they would (a) tolerate each other and (b) be a pair and breed. Well, I let them grow for a while until they reached the 9 in. mark and then started to condition them on earthworms, pond



Cape Fear Spatterdock — *Nuphar sagittifolium*

pellets and kitchen scraps. I was beginning to think they weren't a pair when one morning there were about 100 eggs deposited on one of the stones in their 48 in. tank. I decided to leave the eggs with the parents, as it is so much easier. The eggs were laid on a 2 in. diameter stone in a neat circle. After many hours of cleaning, they hatched in about 48 hours; however, a short time later they were eaten.

"I was not disheartened; so I carried on feeding them plenty of raw meat etc. and about a month later they spawned again. I still left them to get on with it as their previous spawning had been their first and I thought they might allow the fry to live. Sadly I was wrong and they were eaten shortly after they hatched.

"Next time I intend to separate the eggs from the adults—if they will let me because they get a bit cross if I go anywhere near them. I have been unable to watch the spawnings as they always take place at night.

"I much prefer the new way of setting out the readers' letters and your comments, and was pleased to see you have done it again this month.

"In the June issue I read with interest a letter from a Mr. R. Holmes, of Devon, regarding the life expectancy of fish. I purchased a black, red-tailed shark in August 1968—on the occasion of my son's first birthday—and it was about 1½ in., so it may have been 9-12 months old then," writes Mr. Brian Mayhew, of 8 Milton Crescent, Milford Haven, Dyfed. He continues, "The fish was put into a 42 in. × 24 in. × 18 in. community tank, where he lived quite happily for six years.

"On moving house he was transferred to a smaller 24 in. × 18 in. × 12 in. tank, where he still enjoys an active life despite a few catastrophes, i.e. a too-enthusiastic salt treatment for white spot resulting in a pale-grey shark with pink tail! Also, whilst we were on holiday the heater broke down and the fish were in cold water for some days. Unhappily the majority of fish died except 'Old Sharkie'. Perhaps readers could send me some detailed information concerning this species. My fish is now approximately 5 in. in length."

September, 1981

Master Bobby McFadyne is 16 years old and lives at 34 Brownside Drive, Glasgow. He says: "The type of filter that I favour for a small community aquarium is an internal filter; but for a larger tank, especially if it contains large cichlids, I prefer an external filter. Also, if you take an ordinary plastic funnel and drill a hole in the neck where the cup meets the spout, connect the funnel to an air pump by pushing the tubing through the hole, and bury the funnel in the gravel, you have a perfect under-gravel filter.

"In a letter in the May issue it was stated that goldfish should cost £1.00 each. Does it mean that the customer, or the retailer when he buys in the fish, should pay £1.00? If it means the customer, then how does this save the fish from one of those fairground stalls? A new article for the magazine could be based on a few tips on fish-keeping sent in by readers. This way we could all learn from each other." (I think that most readers with tips about the hobby pass them on to other readers through this feature—which has been appearing now for 14 years, if I recall correctly. However, I'd be delighted to receive details from anyone who has any special tips to pass on. B.W.)

I was most interested to read, in the advertisement in the June issue of this magazine, that the Three Rivers-Aquarian Fish Keeping Exhibition included an Open Photography Class. The maximum print size was 5 in. × 7 in. and prints, which were to be sent to the show manager several days before the actual show, were to be displayed for the duration of the show. I don't know what the prizes were, or who won them, but they were donated by Hartlepool A.S. This seems a very good idea to me. Other show organisers could seriously consider including a photography class in their aquarium shows. Perhaps Mr. G. Liddle, who was the show

Hygrophila polysperma





Ludwigia species

manager at the fish keeping exhibition mentioned above, will drop me a few lines—if he reads this—and tell me how well the new class was supported and something about the winners and their photographs.

Photograph 1 shows a young Cape Fear spatterdock plant. Mr. I. D. H. Osgood resides at 37 Oakfields, Broad Street, Guildford, Surrey, and he wrote: "... My own experience with this plant is fairly limited but so far successful. The plant was obtained from Queensborough Fish Farm, approximately six months ago, in fairly good condition. It was planted in my 60 in. x 24 in. x 18 in. deep community tank which has a good layer of peat under the gravel. The water is naturally hard and alkaline but is treated during the weekly water change with Wardley's Target 7.0 pH Adjuster and Tetra Aquasafe. The tank is filtered by an external power filter and light is provided for 15 hours a day by one 40 watt Northlight and one 40 watt Gro-Lux tube. The spatterdock has grown considerably since its introduction and is now 9 in. high and very well entrenched into the gravel and peat.

"I have no knowledge of *Aponogeton ulvaceus*, but do have *A. undulatus* in the same tank as the spatterdock. This plant flowered a few weeks ago on a

long—3 ft. to 4 ft.—runner, the white florets being very numerous on an elongated head. Other plants that grow successfully in this tank are: *Ambulia*, *Hygrophila polysperma*, *Elodea densa*, Amazon sword, *Cryptocoryne willisii*, *Nemaphila stricta*, *Ludwigia* and Java moss—supplied by one of your readers.

"The *Hygrophila* (photograph 2) grows very profusely, even detached leaves being capable of producing roots; and it is necessary to keep the plants well pruned to prevent the tank from being overrun. *Ludwigia* (photograph 3) is also a strong growing plant and fairly frequent pruning is also required. The cuttings can be planted in any vacant areas of the tank, where they will soon take root. I have also found that *Ludwigia* grows even more profusely if grown as a bog plant. A shallow tray, 2-3 in. with a layer of peat, and part filled with water, will provide a ready supply of spare plants as well as a lovely display.

"The Amazon swords (photograph 4) are the other really prolific species in the tank, having covered the entire back of the tank in about 12 months from an original stock of four plants.

"I hope these points will have been of some interest to you and look forward to reading how you fare with your spatterdock in the future."

I blush to report that my spatterdocks are resting at the moment. The Cape Fear spatterdock grew best of all. A large rhizome of an 'ordinary' spatterdock eventually began to rot in one area and I had to trim off a large portion of the plant. Another smaller one just rotted away. Photograph 5 shows an 'ordinary' spatterdock, *Nuphar luteum*. Perhaps I should point out that Mr. Osgood's letter was dated 22nd September, 1980. If Mr. Osgood reads this I should be pleased if he would write again and report the progress of his plants one year later.

No. 21 Wharfedale Drive, Burncross, Chapelton, Sheffield, heads a letter I received from Mr. Steve Dent. He said: "Having kept tropical fish and read *The Aquarist* every month for the past 14 years I thought it was about time I wrote to you. The question that prompted me to write concerned air pumps. Like most people new to the hobby I bought my air pump—a Rena 100—in my first year of fish keeping. I used it to provide aeration and to power an external filter for perhaps six months. Eventually I stopped using this when I got tired of cleaning filter wool once a month.

"Since then I have occasionally set up filters only to dismantle the system after a few weeks. I now feel there is very little to be gained from aeration; and filtration is only necessary with some of the large cichlids etc. As long as you do not overstock your tanks with fish or over-feed, then most fish are quite happy with an occasional partial water change and no aeration or filtration in their tanks. I now use my air pump only for hatching brine shrimp eggs."

Well, there's a fairly controversial statement—although I know that some older, very experienced aquarists would agree with it. Some years have passed since last I used aeration, *per se*, i.e. an air stone; a very considerable time has passed since last I used U/G filters; however, I do have an external filter fitted to each of my tanks. Four are air operated and contain only filter wool; a small, power filter contains only filter wool; and a larger power filter contains a layer of rough gravel, to trap larger particles of dirt, as well as filter wool. I don't use carbon in my filters. Are aeration and filtration necessary; and what mediums do you use in each of your filters?

Mr. Barry Edgeway's letter is headed 'Zooea', Common Road, Freetown, Norfolk. Barry says: "I have been keeping tropical fish for several years now and at one time had a fish house containing 30 tanks. I concentrated on breeding a variety of fish. My most successful fish were kribensis and Siamese fighters. Alas, due to several moves, my fish house was disbanded—much to my wife's delight as I spent most of my spare time out there at the expense of the house and garden. I had tanks inside the house and whilst I could breed fish I was never very successful at growing plants; so when the last of my discus died—through another move—I decided to grow plants come what may.

"I tried various methods, including proprietary fertilisers, which I found useless. I then placed peat in the bottom of the tank and covered that with a 3 in. layer of gravel—medium and coarse combined. I replaced the 40 watt Gro-Lux tube—my tank is 48 in. x 15 in. x 12 in.—with a white 40 watt as used in workshops, etc. The Gro-Lux seemed to stunt growth and cause algae over plants and tank alike.

"The results from the white tube were amazing: within a fortnight plants were flourishing; and the plants that I could never grow before, like Amazon swords, were out-growing the height of the tank. I then decided, as the white tube made the tank, plants and fish look pale and anaemic, that I would put a Gro-Lux alongside, with an independent switch to the white tube so that during the day both tubes are on but during the evening I can get the pleasing effect of the Gro-Lux by switching off the white. I change a quarter of the water in my tank about every two to three weeks for tap water—warmed, of course. I live in a district where the water is very hard so I am limited in my choice of plants; and algal growth is sometimes a problem, but fortunately only on the glass; and it's scraped off when the water is changed. Only a few leaves get coated in algae and I assist the two botias in my tank by clipping off those leaves. There are some plants which never get algae on them at all—like *Cryptocoryne affinis*, which is prolific in my tank.

"I have too many plants but they look so attractive I could not bring myself to take some out. The fish, and I keep many as well, cause the fertiliser

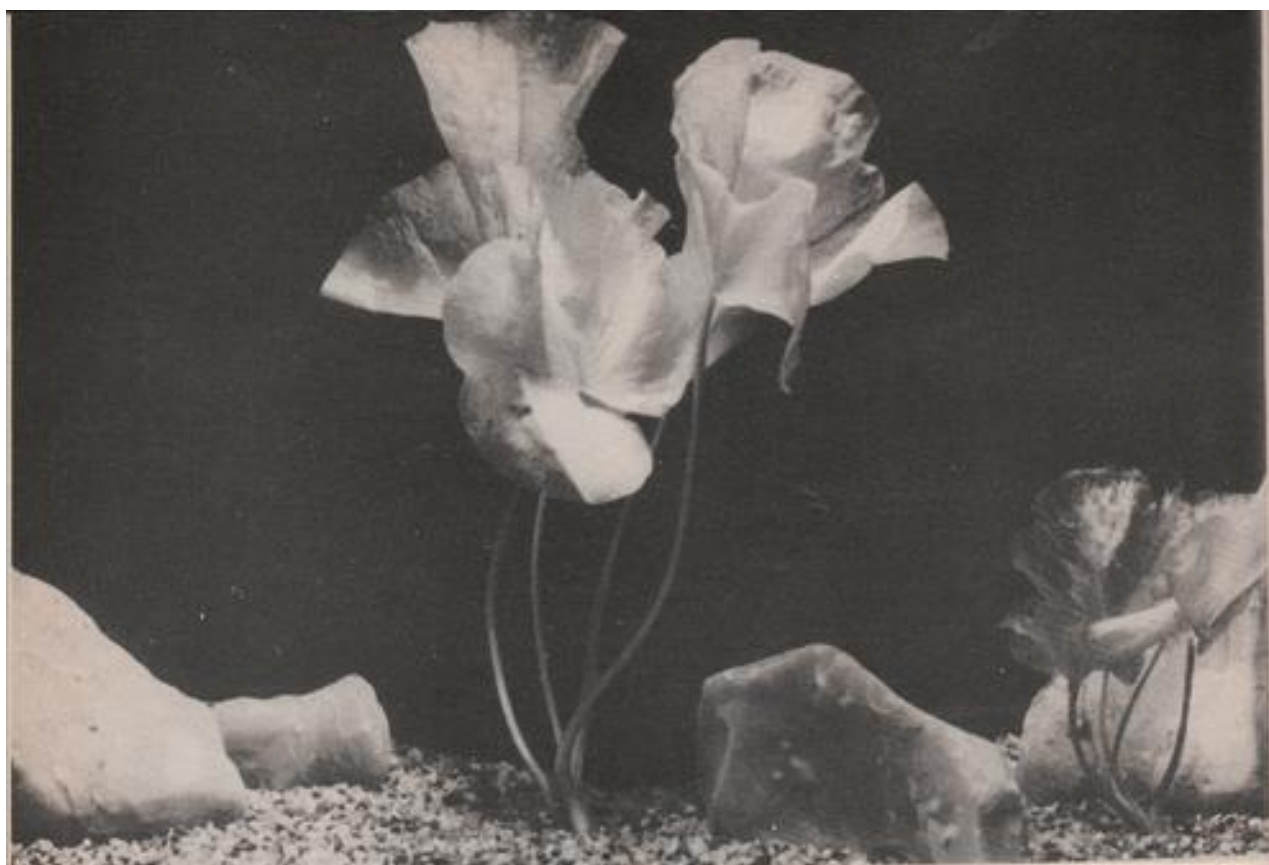
to grow the plants and the fish have to battle their way through the thickets; but they don't seem to mind. I never used to filter, relying on water changes to keep the water clean; but as I could never get the mulm off the tank floor through the plants, the water used to get cloudy; so I invested in an internal power filter and that was the end of cloudy water, the filter being excellent.

"The plants that grow well are *Cryptocoryne affinis*, *C. beckettii*, *C. mendtii* and *C. ciliata*; *Hygrophila polysperma*, and the giant species (formerly known as *Nomaphila stricta*, giant hygrophila is now correctly called *Hygrophila corymbosa*—B.W.); Amazon sword; *Nuphar luteum* (spatterdock), Cape Fear spatterdock—these two have to be kept trimmed or they would get out of hand; *Vallisneria*; and to a lesser extent *Cabomba*—but only as a decoration as it will fade from the base. The ivy leaf cryptocoryne lasts well but does better in a pot on the window sill. Lighting varies between five hours (a day) one week to 10 or even 12 hours (a day) the next, depending upon growth, algae etc. That's all—although I could go on forever; but I would like to write to tell you of problems I have had with keeping neons and sucking loaches; and the nearly-fatal consequences I had with the use of a snail killer."

Mr. and Mrs. N. Lishman's home address is 76 Rydal Road, Kendal. They write: "We have kept dwarf gouramies, *Colisa channa*, for the past three months." (I'll break in here to point out that *C. channa* is the honey gourami; the dwarf gourami is *C. lalia*. I assume that the writers mean the dwarf gourami. B.W.) They continue: "We have two females and one male, which a fellow aquarist gave us. They (the adult fish, I assume) have given us three lots of fry. We have managed to rear about twenty. They are lovely little fish. We have the fry in a little tank,

Amazon sword — *Echinodorus* species





Nuphar luteum — spatterdock

and the parents and the odd female in a large tank with angels, swordtails, platies, guppies, neons, glowlights, loaches and scissortails, but the dwarf gouramies do stand out as they are such cheeky, dashing, little fish, afraid of nothing. We hope to keep them all in one tank when the fry are big enough."

No. 56 Norman Avenue, Wood Green, London, N22, is the residence of Mr. B. Care. He tells us: "I have just had my first success at breeding cichlids. I have had a pair of *A. curviceps* (*Aequidens curviceps* is the flag cichlid—B.W.) for about nine months and although they have always stayed together they have never shown the slightest inclination to breed. Until recently they were kept in a 36 in. tank along with other dwarf cichlids; and despite changes to the hard, alkaline water of the area by the addition of de-ionised water, and peat in the power filter, the fish still stubbornly refused to breed.

"In a final attempt I set up an 18 in. tank, furnished it with black gravel and suitable stones for egg-laying, and planted it fairly heavily with *Cabomba*. The water chemistry was adjusted to 14 DH and the pH 7.2. The temperature was set to 78 F; there was natural lighting from a nearby window; and

the water was filtered by a U/G filter. I then introduced the *A. curviceps* to their new home.

"Within a couple of weeks the back of the tank became heavily overgrown with algae and with the now heavy growth of *Cabomba* the tank was looking distinctly murky. A 25% water change was carried out after two weeks; and two weeks later the curviceps began digging various pits in the gravel. Finally a batch of eggs appeared in one of these pits a week later.

"After three days of continually moving the eggs from one pit to another the eggs hatched; and after a further two days the fry, numbering about 100, were swimming and the parents spent much of their time trying to keep the shoal as close together as possible. The fry are now being fed on newly-hatched brine shrimps and appear to be thriving.

"This limited success has encouraged me to continue trying to breed other cichlids in the future as my interest is now firmly in the Rift Lake cichlids."

Mr. M. E. Fensome resides at 7 Arrow Close, Marsh Farm, Luton, Beds., and he has been keeping fish for over two years. He says: "Over this period I have turned our small back room into a fish house in which I keep various fish, mainly cichlids. I am

writing to tell you about a beautiful pair of white convicts, *Cichlasoma facetum*, that I purchased about a year ago. I put them in a temporary home which, for want of a better place, I am afraid to say, was my 72 in. oscar tank, a foot of which had been previously sectioned off. They settled down quite well despite the full attentions of my three oscars, one of which is a full foot in length and looks as if it has gone 20 rounds with a world-class boxer. As I said, this was only a temporary set up whilst I was setting up a more permanent 36 in. tank.

"During the week or so it took to set up the tank and let it mature, the convicts spawned without my knowing. It went unnoticed until the fry first ventured out of their flowerpot home. It was the oscars that turned my attention to the fry; they were ramming the glass partition. This, of course, caused utter panic. My wife, not wishing to lose any of the fry, was rushing in and out in a total panic; but this was short lived because I soon had siphoned the majority of the fry into a suitable container—after which I re-housed them in my hospital tank as it was vacant and clean. The oscars succeeded in their goal: they got some of the fry out of that spawning. I have kept about four pairs that are growing nicely in a tank of their own.

"Since that time the original pair have spawned time and time again at four to five weekly intervals, 50 to 100 eggs at a time. Most of the babies have been sold, or culled as food for the oscars. Fish from other spawnings are being kept, I hope, to breed with the mother or father.

"In the May issue you asked for readers' opinions on good books. Well, I would recommend any of the six books covering breeding by Herbert R. Axelrod. By the way, could you please send me any information on societies concerned with tropical fish-keeping in my area as there do not seem to be many aquarists where I live?" (Unfortunately I don't have any information about aquarium clubs—other than that that I have published in this feature on occasions. It would be helpful if anyone with relevant information would drop a line to Mr. Fensome. A glance through our *Notes from Aquarists' Societies* pages, and *Dates for the Diary* section, could prove useful. They contain the names, addresses and telephone numbers of aquarists in various clubs around the country. A phone call to someone who lives in your area could provide some useful information. B.W.)

My thanks to Mr. M. D. Moulder, of 49 Eristock Close, Crownhill, Plymouth, who sent me an interesting collection of coloured photographs of some of his fishes—which range from beautiful cichlids to a rather horrific scorpion-fish.

For next time please send me your opinions on any of the following: (a) dried foods that your fishes prefer; (b) conditioning foods from your own kitchen; (c) the growth of pond plants this summer; (d) uncommon species of fish that you keep; (e) air-operated aquarium 'vacuum'

cleaners; (f) cultivating *Echinodorus* (sword plants), *Cryptocoryne* or *Aponogeton* species; (g) breeding neons or cardinals; (h) controlling algae; (i) breeding mollies; (j) postal services for aquarists; (k) aquarium hoods—design features; and (l) aquarium shows that you visited. I hope you've had a pleasant summer and that you'll find time to drop me a few lines c/o *The Aquarist & Pondkeeper*, The Butts, Half Acre, Brentford, Middlesex TW8 8BN. Please PRINT your name and address clearly and write on only one side of each sheet of paper. As I like to include a selection of letters from younger and more mature readers it's useful if you're a younger reader to mention your age. By the way, if you have not yet sent me your findings about and opinion of Gro-Lux lighting when used over aquaria, please do so soon. I'm particularly interested to hear of its effect on plant growth—on both higher plant forms, and lower forms such as various algae.

Goodbye until next month; and please keep the letters rolling into me. I'll look forward to hearing from you—either again, or for the first time.

IN OUR NEXT ISSUE

DARTERS — a beautifully illustrated colour article by Dr. Robert Goldstein.

SPOTLIGHT. Jack Hems focuses our attention on the *Betta imbellis*.

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Night Lights in the Aquarium

*From observations
made with a
captive Lemon Shark*

by
*Colin Grist, Poole Aquarium,
Dorset*

TO THE BEST of my knowledge, pelagic or semi-pelagic species of sharks, (*Elasmobranchii*), have never been successfully maintained in captivity in Britain. Smaller, generally bottom-dwelling, sharks are normally kept, like the various tropical catsharks, (*Hemiscyllium*, etc.) and occasionally the Nurse Shark, *Ginglymostoma cirratum*, but this species grows far too large for most aquaria to handle, (maximum length approximately 14 feet). British coastal species are usually kept but, even amongst these, only the dogfishes, (*Scyliorhinus*), seem to thrive. Tope, *Galeorhinus galeus*, and Smooth Hounds, *Mustelus mustelus*, etc., do not survive for long in tanks. Sharks damage very easily due to them having only a cartilagenous skeleton which does not give protection to the internal organs. So catching and transporting techniques have to be perfected in a way not to harm the animals. If this is achieved, there may be a better chance of maintaining the specimens.

For the past two years I have been working with a young 4½ foot male Lemon Shark, *Negaprion brevirostris*, that shares the 6,000 gallon tank at Poole Aquarium with a 4 foot Nurse Shark, *Ginglymostoma cirratum*. Both these sharks were caught off the Florida Keys. The Lemon Shark is a coastal species that is semi-pelagic when young, but becoming more pelagic later in life. They are by no means bottom-dwellers, but juveniles will spend quite a bit of time resting on the sand. Lemons are rated as the 5th most dangerous shark in the world, and they are notoriously aggressive in captivity; however, our specimen is reasonably docile most of the time but does have his moments.

There are numerous problems to be overcome, when keeping large sharks and there are various husbandry techniques and aspects of tank design in relation to shark dynamics and habits which should be employed if even a modicum of success is to be achieved. The number of problems to deal with increase when attempting to keep these creatures in a closed system as we use at Poole.

I could write volumes on these problems and possible ways to solve them but the real purpose of this article is to relay a simple idea that came to my mind as a direct result of trying to solve many of the problems I have had trying to maintain this Lemon Shark. It is basically to do with light at night.

For many months I had continually found the Lemon Shark to be lying on its back, at the bottom of the tank, first thing in the morning. It became a daily chore having to 'kick start' the creature to make it swim. In fact, I had to lift the shark to the water's surface by using a long pole. If half way up the shark slid off the pole, it would spiral in an attempt to start swimming, but always it would end up on the bottom again. It seemed to be totally disorientated and appeared to be having an epileptic fit. However, when I finally succeeded in getting the shark to the surface, it would manage to orientate itself and swim normally for the rest of the day. At first it was thought that the shark was suffering from brain damage, but, this was ruled out when it was observed that it would spiral in

any direction. If there was any brain damage, spiralling would most likely be in one direction only. The next suggestion was that there might be a build up of fats caused by over feeding. It is easy to overfeed a shark as, due to its dynamics, it is probably the most efficient swimmer in the seas; it needs little food in relation to its body weight. So I stopped feeding for nearly two weeks but this really made matters worse if anything. So that idea was dismissed. Also a build up of gases was a possibility and this would certainly be an answer to why the shark was rolling over onto its back. However, it was sinking to the bottom and if gas was the problem, the shark would eventually become more buoyant and float to the surface. The most likely of all the suggestions made is that there has been damage to the 'inner ear'. This would cause disorientation and unbalancing and also spiralling in any direction.

The tank that the sharks are housed in contains a number of large rocks and a sunken boat which have been obstacles for the Lemon when disorientated. Some damage has occurred to the shark's skin tissue, particularly around the snout area, due mostly to crashing into the boat. One day it occurred to me that, because the aquarium building has not got any windows around the exhibition areas, at night there is complete blackness.

I had often thought about the fact that it never gets totally dark on coral reefs, apart from in deep caverns but these thoughts had never before registered enough to make me go into the subject any deeper. When diving in the Red Sea I was surprised at how far you can see underwater at night once your eyes became used to the dark. The water in the Red Sea is crystal clear as in other coral reef areas. So I wondered whether slight illumination over the shark tank during the night would help the Lemon Shark's ability to pick out the basic shapes of the boat and rocks. As I have already mentioned, Lemons are as a rule a coastal species in areas where illumination throughout the night is quite good. So I rigged up a low wattage night light and have not had any problems with the Shark ever since. He swims well, feeds well and never goes down to the bottom anymore.

I also wondered, and I am sure that I am not the first to do so, whether this idea, if put into practise, would be generally beneficial to the well-being of other aquatic animals. Even in most bodies of freshwater it does not get totally dark at night; at least not in the shallow areas where the majority of organisms live, as on the coral reefs also. So perhaps in a room where there is an aquarium tank the curtains should be left open through the night; or a low wattage light bulb, possibly one coloured blue, left on. I know that it is unlikely to have the same sort of problems of bumping into objects in the dark with most aquarium fishes, but it seems that a night light can help to cut down levels of stress, particularly in coral fishes.

I am sure that our Lemon Shark has got some sort of damage to the 'inner ear' but with this illumination the creature is no longer damaging itself which, had it been allowed to continue, would ultimately have made the problem very serious.

Book Review

Continued from page 51

With a determination to reveal the whole truth about the planning, construction, stocking and maintenance of a pond/water garden, the author makes plain his sound views on the advantages and disadvantages of introducing each of the myriad plant and animal forms to this highlight of the garden. With no wastage of words he describes the delights and pitfalls, the attention to detail which is essential and the varying needs for the differing situations enforced or required. The enterprise so exhaustively dealt with is aimed at the gardener who is embarking on an additional adjunct to his colourful plot where the fish will form a lively bonus to this garden feature and as pond gardening is so different from what maintains elsewhere on the domestic patch, great pains have been taken to detail the innumerable factors upon which depend the possible success of making a self-sufficient world within the confines of an artificially constructed basin of water where a balance must be ensured so that excesses within life species do not occur to the detriment of others.

Many aquarists know many of the answers to the problems of keeping fish in good fettle but are less *au fait* with the intricacies of plant propagating and care. Many gardeners can plan and plant colourful surrounds of a pond but later deplore the conditions which arise, through ignorance, within the water. The author ensures that the know-how of each of these two hobbyist endeavours are brought together to produce what can be, undeniably, the most attractive feature of the English garden.

All types of pond construction and materials are discussed and possible pitfalls dealt with. The basic formulae for the best design and size for differing requirements are detailed as is the important business of stocking with plants and fish and emphasis is placed upon the need to stock within the eventual limitations of the water volume as the plants and fish settle down, prosper and grow to maturity.

In dealing with fountains and waterfalls to move the water, attention is given to the need with waterfalls for careful building so that they may provide the audible pleasure of cascading water.

A chapter on the water gardener's year is divided into four seasonal headings under which the reader will find described the various needs for his attention with the passing of the year.

It is difficult to find anything that has been overlooked in this very comprehensive dissertation on the production and maintenance of a successful pond and water garden and both the tyro and the semi-expert will be delighted to have this book in his library.



Coldwater Queries

by Arthur Boarder

I have a tank, 48 in. x 24 in. x 18 in. and would like to know how many goldfish it will hold. I prefer the Veiltails and would like to know the best type to have? Also, what wattage lamp should I have for this tank for lighting?

Your tank will hold 48 in. of length of fish, excluding the tail. When stocking you should realise that this is the maximum amount to have and so you should allow for growth. The calico veiltail is the more handsome fish and I do not think the visibly scaled type is nearly as good. The scaleless variety was the only kind recognised years ago and the scaled type was only brought in many years later. This type has harder finnage and so it is not as flowing and attractive as the calico variety. I have found that in a tank, fantails are better than veiltails as they are always more active; veiltails are more frequently sitting on the bottom.

Two 25 watt lamps should be sufficient for the tank as they will provide enough light to encourage the growth of the plants and yet not warm the water too much.

I have a pond, 4½ ft. x 3 ft. x 8 in. and the water got very green. I flushed it out well, refilled and within a few days it was green. What else should I do?

Any pond will turn green as Algae forms in water exposed to the sunlight. Your pond is small and very shallow which means that a large quantity is exposed to the light. Such a pond is always more difficult to keep clear than a larger and deeper one. You will have to get plenty of under-water oxygenating plants to choke out the Algae. It may take some time for the plants to get well established before they will clear the pond. Some Duckweed on the surface will help to keep out much of the light and later on, when the water is clearer, these plants can be flushed off with a hose. Such plants as Marsh marigold and water iris are not oxygenators but are useful in a pond as their roots use up much of the waste matter from the fishes.

What is a good method for planting the oxygenating plant, *Lagarosiphon major* in a pond?

It is only necessary to ensure that the lower part of the stems are on the bottom. Roots are soon sent out but until this happens it is well to ensure that the stems remain on the

READERS SERVICE

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

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

bottom. One good method is to gently wrap the ends of the stems in some clayey soil in a small net bag. The roots will soon emerge from this bag and the plant should grow well.

I would like to breed a good strain of Cambridge-shire Blues and will be glad to hear of anyone who can supply me with a couple of pairs?

There is no such variety of fancy goldfish described by you. This is probably a term used by some dealers but the true variety is either a Bristol Shubunkin or a London Shubunkin. The correct colouring of these fishes should be a ground colour of a rich blue with red, brown, yellow and mauve in patches and the whole blotched with black. The brighter the colours the more likely is a fish to be a prize winner. The fish should show no visible scales and the gill plates should be soft. The Bristol type is slimmer than the London type and has larger finnage. The latter variety is more suitable for an outdoor pond during the winter. An address is included.

Three years ago I put 10 golden Orfe in my pond and they were from 2 to 18 inches long. The pond went green and I did not see the fish again until I emptied the pond recently. I then found a fish about a foot long and it was completely pure white except for black eyes. Is this unusual, and if not, do you know where I could get another similar fish so that I might be able to breed and establish a strain of white Orfe?

It is certainly unusual for a pure white Orfe to turn up. It is not an albino or it would have pink eyes. It has just gone through a colour pigment change. The same thing sometimes happens to goldfish when they turn partly or wholly white. Even if you could get another white Orfe you would have to be very lucky to have both sexes. They are not easy to sex when out of breeding condition.

Even if a true pair spawned it is not certain that they would produce white offspring. You could even get a few white youngsters from pairing your fish to an ordinary coloured golden Orfe. These fishes have already gone through a colour pigment change as the wild Orfe from which they appeared are *Idus idus* a fish similar in colour to the Bleak *Alburnus lucidus*.



Tropical Queries

by Dr. C. Andrews

We have just installed a 100 in. x 15 in. x 12 in. aquarium in the lounge bar of our public house, and would welcome your advice on lighting, filtration, heating, and which fish species to stock with. Since we are relative newcomers to the hobby can you also recommend one or two "basic" books, and send us details of our local aquarist club.

I am sure that your tank will make a very attractive show piece in your "pub". Assuming that the tank will receive very little natural daylight, I suggest that you try three 40 watt fluorescent tubes, left on for about 8-10 hours per day. You may wish to split the illumination period into two—to cover opening hours!

Assuming you wish to keep a community tank of tropical freshwater fish (see below), I would suggest that in a tank of this size (and bearing in mind it is in public view) that you install undergravel filtration. Seek the advice of your local pet shop as to which air pumps they recommend as efficient and quiet—I have found *Rena* and *Whisper* pumps very good. You will probably require two *Rena* 301's, or the equivalent *Whisper* pump(s).

To try and avoid the adverse effects which undergravel filtration may have on plant growth, I suggest that you root your plants in small plastic pots containing a mixture of aquarium peat and garden soil. You might like to try *Plant Pillows* (manufactured by Underworld).

Since your tank is situated in the bar of a pub, I would ensure that the cover glasses and hood are well fitting, and that you try and situate the pump(s) where there is a good flow of fresh air.

Assuming that the bar is more or less continuously heated in the cooler months of the year, I would suggest that two 200 watt heater-thermostats (three, at most) will be adequate.

The choice of fish is up to you—I would go for some peaceful shoaling tetras, one or two pairs of dwarf cichlids and gouramis, a small shoal of *Corydoras* catfish, and perhaps some less aggressive barbs like cherry and yellow barbs.

"Aquariums" by A. Evans (Foyles, about £1.25) and "Tropical Fish" by B. Ward (MacDonald Guidelines, about £1.50) are two good beginners books. Details of your local aquarist club may be obtained from T. Glass, Federation of British Aquarist Societies, 10 Adelaide House, Portobello Road, London, W.11.

I have recently started keeping discus, and some of my fish have developed fin-rot. Can you recommend a treatment, and can you also provide some information of books on discus-keeping?

You will find the book "All About Discus" by H. R. Axelrod (T.F.H. Publications, about £5.00) interesting, and I should draw your attention to the British Discus Association, c/o R. Maudsley, 102 Meadow Street, Preston, Lancs.

Fin-rot may be treated in a variety of ways, including the use of a general fish tonic which should be available from your local pet shop. Some aquarists have had success following dipping the affected fish in a strong solution of malachite green, and then returning the fish to a tank containing a much more diluted solution of this chemical. A proprietary brand of fungus remedy may be used in this fashion—ask your pet shop for details.

I must, however, stress two further points. To begin with, fin-rot is often a sign that something is wrong with your tank management, and I suggest that you check for overfeeding, tank pollution, incorrect temperature, inadequate filtration, or too few partial water changes. Secondly, discus are very delicate fish, and hence special care must be exercised when treating them. You might like to contact your local veterinary surgeon before proceeding any further—see 'Yellow Pages'.

How can I get my fire-eels to eat something other than earthworms?

Fire-eels (*Mastocembelus*) prefer live, "wormy" foods—very often to the exclusion of all else when kept under aquarium conditions! You could vary the diet by using white-worm and perhaps *Tubifex*, or you might like to try and tempt your fish onto dried *Tubifex* or a tablet food such as FD Tips. I am inclined to think that earthworms will remain an important part of the diet of your fish!

By the way, fire-eels are not fussy over water conditions, although extremes of pH and hardness should be avoided. Keep them at a steady temperature somewhere between 22-27°C, and carry out regular, partial water changes. Fire-eels are quite secretive and largely nocturnal—hence the aquarium should be well planted and have plenty of hiding places.

How can I tell if rocks or gravel are safe to use in my aquarium?

You should try to avoid using rocks or gravel which are obviously dirty or contain an excess of organic matter, or which contain limestone (the latter of which may increase pH and hardness in your tank).

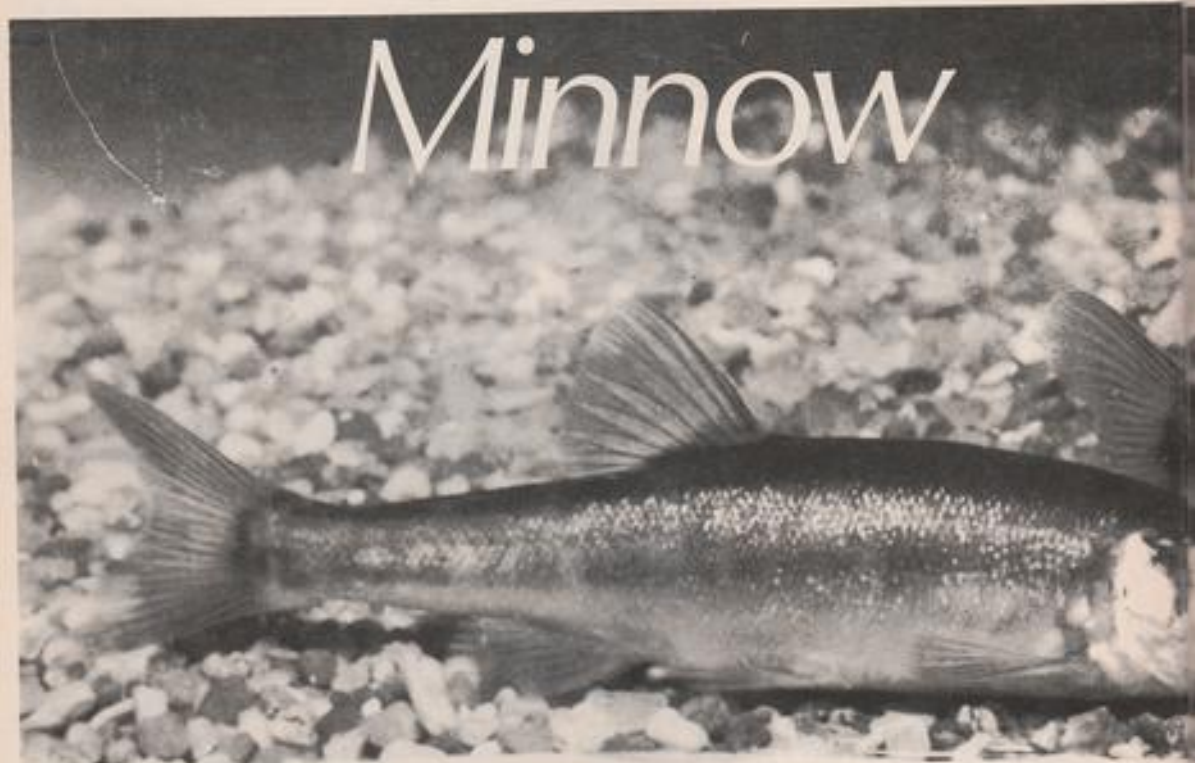
You may determine whether gravel or rock contains limestone by dropping a little dilute acid or vinegar onto it. If it bubbles, it contains limestone. If it does not bubble, then it should be scrubbed, rinsed or otherwise thoroughly washed before it is used in an aquarium. If you still wish to be "extra cautious", you could place the gravel or rock in a small tank or bucket for a few days, and then try keeping a few inexpensive fish in the same receptacle.

Native Aquarium Fish by Frank Orme

The Minnow has a cylindrical-shaped body and short bluntish head, it has very small scales (there are between 80 and 100 along the lateral line), that give a silver-grey background to the irregular dark bars that are placed vertically on the sides of the fish. The back is a dark green or brown, bordered on the sides with a golden stripe. Only rarely does the Minnow exceed 4 inches in length. Although it may resemble some other small species of the carp family it can

lead to their downfall—if the object happens to be 'minnow trap.'

During May to July, the Minnow is in breeding condition; it assumes a scarlet flush to the belly and, again in typical carp fashion, develops small whitish nuptial tubercles on the head and thickened ray of the pectoral fin. The fish do not pair off with individual partners but spawn haphazardly in a 'flock'; thus a single male may fertilise the eggs of many different females. The spawning fish congregate in large



THE MINNOW (*Phoxinus phoxinus*) is one of the most common of our native freshwater fishes. It is a member of the large family of carps, Cyprinidae which is the largest of the fish families with around two thousand species distributed throughout the world. Found in Western Europe to as far afield as Lake Baikal and some of the Siberian Rivers, the Minnow can be found in many clear, sandy or gravel bottom streams, rivers, ponds and lakes.

be singled out by the lack of barbels and the golden band on dappled sides, which makes it a much more handsome fellow than its more uniform and drab-in-colour relatives.

Minnows tend to form large shoals swimming along the border between the shallow and deeper water in alert procession. If alarmed they dart into the greater safety of the deep water until the danger has passed. Being inquisitive they will examine any bright or unusual object and this can

shoals near sand or gravel banks in shallow water, and during the hectic activity of the spawning chase the fish become oblivious to danger and can be caught fairly easily. Each female is capable of laying up to a thousand eggs which are very small and adhesive, sinking through the water to stick to the gravel of the breeding site.

Usually the angler is only interested in this fish as bait with which to catch larger fishes; however, the aquarist will discover that Minnows make

suitable occupants for both the aquarium and garden pond where they will prove both hardy and lively. In the pond they shoal near to the surface, twisting and darting in flashes of silver—occasionally leaping to capture a fly or some other small insect.

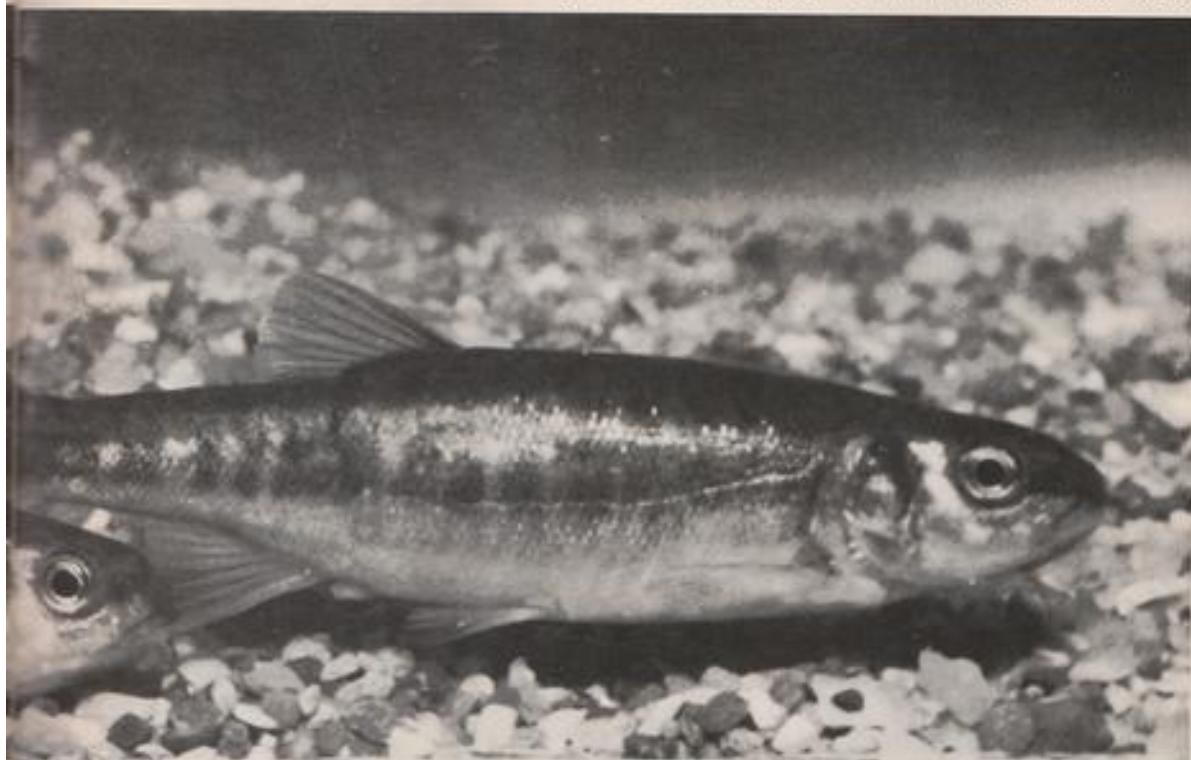
As has already been mentioned, they have an inquisitive nature and like most fishes of this type, under domesticated conditions will soon lose all fear and become quite tame. It must be remembered, however, that

gone through a period of quarantine.

Being a member of the same family as that of the Goldfish, the Minnow is quite safe to keep with other fish of a harmless disposition. Although under natural conditions the Minnow feeds upon small live foods, vegetable matter, small worms and the eggs of fishes, it will, quite readily, accept all those foods which the Goldfish accepts. In the pond Minnows will add movement to contrast with the lazy swimming of some other species,

the temperature is raised to about 70°F. (21°C.) to speed up the hatching period. The fry are then raised on small live foods, such as *infusoria*, newly hatched brine shrimps and on to graded *daphnia*—always matching the food size to the development of the fry.

The coldwater fishkeeper will find that the Minnow is an ideal small fish, hardy, active, easily satisfied with the usual types of food, without vicious habits and easily tameable. At one



they do require clean, spacious living quarters if they are to remain healthy. Being from the wild they will more than likely be carrying some unwanted pests, for few fishes in their wild unrestricted natural state can avoid the attention of parasites. Never make the mistake of overlooking this fact when dealing with any fish brought in from the wild; it could be harbouring trouble for your healthy stock if released into quarters containing healthy fishes without having first

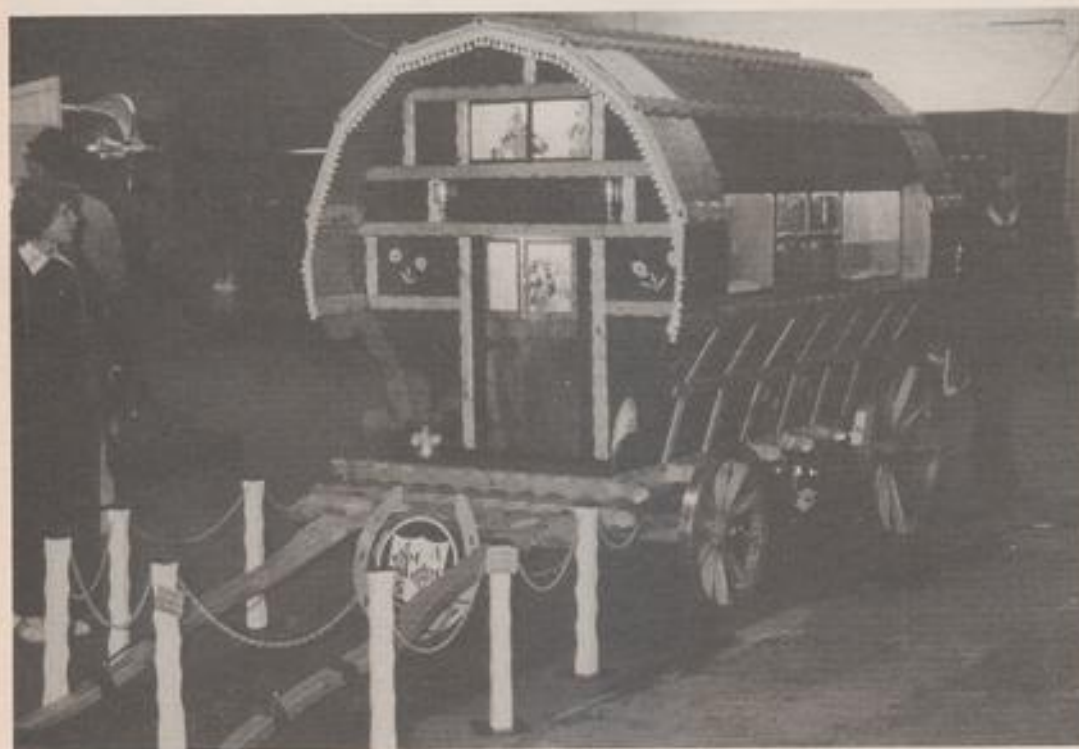
whilst in the aquarium they will provide continuous activity. However, they are great jumpers, therefore the tank should be covered to prevent accidental losses.

Although in nature the Minnow indulges in mass spawning it is quite possible, if the right conditions are provided, to encourage a pair of Minnows to spawn. After the spawning is completed the fish should be removed and the eggs hatched in just the same way as those of the Goldfish;

time many dealers in aquarium fishes were able to supply the Minnow but that is no longer the case. Nowadays supplies must be sought by approaching anglers, or by catching them yourself. Whichever method is used, it is certainly worthwhile to endeavour to obtain a few specimens of this attractive fish which will amply repay the care devoted to their well-being.

Horsedrawn, Steam or Diesel

by Alan Darby



WHAT ON EARTH has Horsedrawn, Steam and Diesel to do with fishkeeping, you might be asking yourself. Well apart from being forms of transporting fish through the ages, these are a few examples of the Tableaux constructed at the British Aquarists Festival.

One of the main attractions to the Festival, especially for the General public, are the tableaux, which house the competitive sections of fish. Each tableau being built by

individuals of societies to enable them to display their exhibits.

At past festivals there have been many interesting tableaux ranging from fireplaces to houses, dice to pinball machines, books to libraries, bars to public houses. The list would seem endless. Yet societies still arrive each year with new ideas. Yes there is always something different at the British Aquarists Festival.

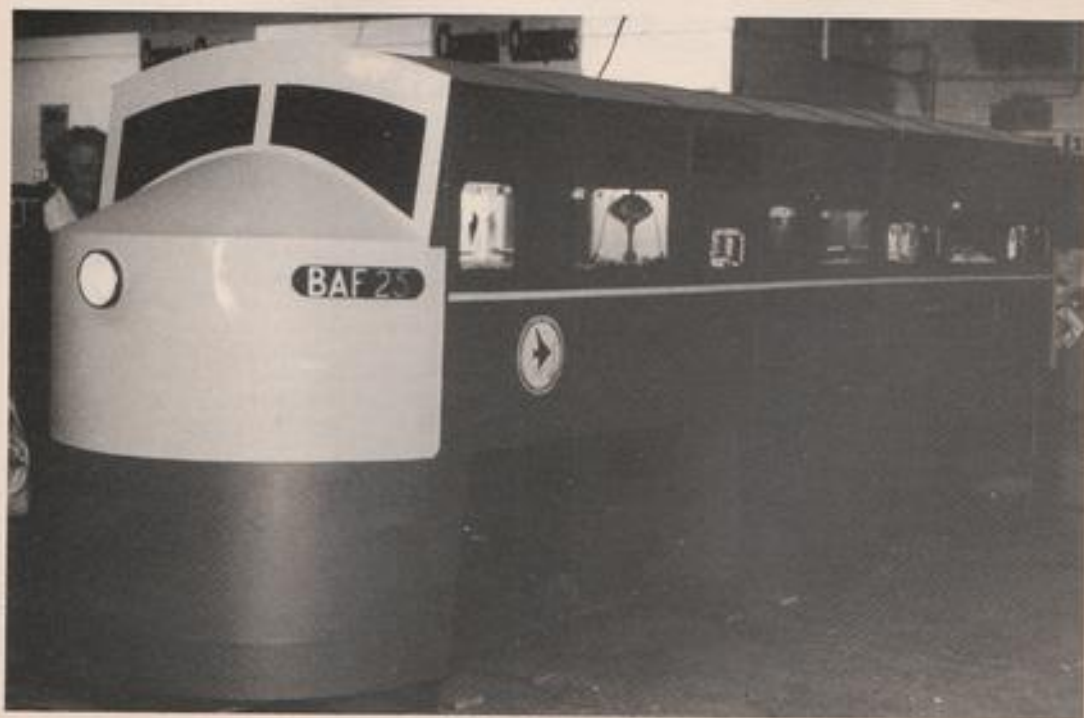
"What shall we make for B.A.F.?" is the cry of interested societies when the year is still in its prime, and members put on their thinking caps. Eventually a decision is reached. Then, down to the "nitty gritty" how much will it cost?, who will help to build it?, who will put fish on it?, who will take it?, who will bring it back? When all these questions have been answered and materials have been bought, begged or borrowed the societies resourcefulness is rewarded by a finished tableau. Each society hoping their tableau will gain a rosette at B.A.F.

A few societies may be dissuaded from constructing a tableau because of the expense of materials, but this is a fallacy, as a tableau winning society paid less than ten pounds one year for their materials, although a tremendous amount of man hours work was put into the fine details and working parts.

Also at the Festival are the number of novelty tanks on display, some of which are serious, but most are there to make you smile.

Another attraction for all fishkeepers and enthusiasts are the numerous traders who, between them, offer for sale an abundance of fish from around the world, and a fine selection of food, equipment and accessories. If you keep a tropical, marine, coldwater aquarium or vivarium, your needs can be met and prices compared, under one roof with the minimum of fuss.

Why not pay us a visit at Belle Vue, Manchester on the 7th & 8th November 1981.





Plant Queries

by Vivian De Thabrew

I have a freshwater aquarium 18 in. \times 10 in. \times 10 in, housing 5 small coldwater fish, namely: Fantail, Shubunkin, Black Moor, Calicos, etc. The tank is unheated and is fitted with a 30 watt tube light fitted into the plastic domed hood. The temperature ranges from about 64°-72°F, provided I raise the hood with about 2 plastic rulers by about 3 in. to 4 in., otherwise I find the temperature shoots up from about 68°F to well over 75°F, which I think is too warm for this type of fish. The light is on from 8 a.m. to 1 p.m., then off until 4 p.m. and on again until 8 p.m. By breaking the lighting period in two I find the temperature is more steady, but I fear may not be intense enough to prevent brown algae on the plants. At the moment I have: 1 *Syngonium spathiphyllum* (Ivy-leaf Crypt), 1 bunch each of *Elodea densa* and *Elodea crista*, 2 *Eleocharis acicularis*, several *Vallisneria spiralis torta*, 1 *Ceratophylla* (unknown type), 2 Amazon Swords (not doing too well) and 2 other plants, origin not known.

I would welcome your comments on this set-up. Are the plants suitable for this temperature? How does one give sufficient intensity of light without the temperature shooting up? Would *Echinodorus tenellus* be suitable? Two dwarf Crypts don't like the set-up. This is a hard water area. I cannot afford sophisticated equipment or test materials.

Your problem concerning the rise in temperature from 68°-75°F once the hood is secured properly is a critical one. Certainly this temperature is too high for your coldwater fish. I wonder whether you could decrease the wattage to 20 and experiment to see whether this would create a marked effect in the temperature fluctuation. As your tank is only ten inches deep, the intensity of light should be adequate for the plants which you have mentioned. The other solution would be to have an opening or window on the side or top of the hood, in order to let the excess heat escape, thus keeping the tank cooler. In this case a 30 watt light would be satisfactory.

The reason for the dwarf *Cryptocorynes* not doing well would most probably be due to the hard water condition and not due to lighting. *Cryptocorynes* generally prefer moderate light and will even grow well in subdued light. *Echinodorus tenellus* prefers a pH of 7.0-8.0 but likes good light. However, it should do fairly well in your tank provided the planting medium is fairly nutritious. If you have some organic mulm or detritus in your gravel

(from your decaying plant matter and fish waste) this species should grow well. Some of the species which are most undemanding and hardy which I think will be suitable for you are: *Aponogeton crispus*, *A. undulatus*, *Hygrophila polysperma*, *Rotala indica*, *Limnophila heterophylla*, *Cryptocoryne beckettii*, *C. affinis*, *C. griffithii*, *Crasula aquatica* and *Bacopa amplexicaulis*.

You do not need to incur any large expense in order to reduce the water hardness. If you can collect some rainwater you can then filter this and use it in your aquarium. By using a thin layer of peat under your gravel you can make your pH acid, provided it is not acid already. The best way to use peat is to soak it in a container overnight, squeeze it out, spread it as a layer at the bottom of the tank or over the filter-plates, and then cover it with the gravel. You can also carry out a partial water change using rainwater.

I have recently ordered from one of the plant companies a *Nuphar luteum*, which I believe is the Cape Fear Spatterdock. I have a choice of two coldwater aquariums to use with a room temperature range of 60°-70°F and water with a pH of 7.2-7.4 and medium hardness. The tank sizes and lighting are as follows:

- 39 in. \times 12 in. \times 15 in.—30 watt Gro-lux tube on around 12 hours a day (little sunlight reaches the tank).
- 24 in. \times 12 in. \times 15 in.—15 watt Gro-lux tube on around 12 hours a day, + 2 \times 25 watt pigmy bulbs on for about 3 hours in the evening (little sunlight reaches the tank).

The 39 in. tank has power and bottom filters and the 24 in. bottom filtration only. I plan to plant the rhizome in a flower-pot with a mixture of gravel, plus peat and some Fisons multi-purpose compost.

I would be very grateful if you can give me advice on which tank would give me the best chance of success, and if I need to change the water, lighting and compost, etc. to suit this particular species.

The best thing I can do is to list the ideal requirements for the species and then suggest some ideas.

Nuphar luteum is the Yellow Water-Lily. The light green leaves form a rosette under the water. This plant should be grown in a planting medium consisting of some peat, or rich nutritious matter with sand or gravel. It requires plenty of light and a temperature range of 60°-76°F. The water should be soft and acid. These conditions will control the plant growth and thus restrict its growth of floating leaves, thereby keeping the plant compact and tidy.

Therefore try to reduce the pH of your water to an acid level and make the water condition soft. If you maintain the pH at 7.2-7.4 and the water medium-hard, the plant will have vigorous growth, and therefore will have floating leaves. I suggest you try growing this plant in your 39 in. tank. If you can, use a 40 watt light for 10 hours per day. Growing the rhizome in a flower-pot is quite satisfactory. If you can, incorporate a little clay in the flower-pot, and it will be appreciated by the plant.



from Aquarists' Societies

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

SOUTH EAST



Brighton & Southern A.S. meetings are now held at Hillside School, Foredown Road, Portulade, East Sussex, commencing at 8 p.m. on the first and third Mondays of each month. New members always welcome. For further details contact Hon. Secretary, Mrs. Edna Smith (tel: Storrington 3052).

South Park Aquatic (Study) Society held its 13th open show for coldwater fish and plants on 20th June at the Wimbledon Community Centre. A record number of 166 entries of fancy goldfish, koi, native and foreign and centrarchids were received from as far afield as Milton Keynes, Portsmouth, Essex and Bristol, with all 18 fish classes being well supported. In addition 11 new classes for plants were judged by eminent plant experts, Ron Fowler. Fish judges were Ben Blundell, Mike Colewell, Ross Dodkins, David Dudley, Gordon King, Johnny Kingstead and D. J. (Mac) Mackay who had the difficult task of judging the many high quality fish brought.

Results: Fish—Vivid: 1, J. Leamy; 2, D. A. Brooks; 3, A. Nichol; Bristol Type Shubunkin: 1, R. Graham; 2 and 3, G. Bell; 4, G. Lewis; Globe-eye: 1 and 4, G. Lewis; 2, T. Jacques; 3, J. Webster; Breamhead: 1, 3 and 4, G. Lewis; 2, J. Pollard; Bubble Eye: 1, 2 and 3, G. Spear; 4, G. Herring; Celestial: 1, G. Lewis; 2 and 3, Mrs. M. Dudley; Pom Pom: 1, S. Herman; 2, 3 and 4, J. Pollard; Penciltail: 1 and 4, R. Williams; 2, J. Pollard; 3, T. Jacques; Common Goldfish: 1, C. Brown; 2, Mrs. S. Brown; 3, Mrs. M. Dudley; 4, R. Graham; London Shubunkin: 1 and 4, P. Peart; 2, Mrs. M. Dudley; 3, J. Pollard; Oranda: 1, J. Pollard; 2, D. A. Brooks; 3, G. Lewis; 4, E. Franklin; Broadtail Moor: 1, Mrs. M. Dudley; 2, D. and P. Lambert; 3, F. Prael; Fantail: 1, R. A. Field; 2, Mrs. M. Dudley; 3 and 4, G. Lewis; Comet: 1, D. A. Mackay; 2, G. Lewis; 3 and 4, D. A. Brooks; Breeders: 1 and 2, G. Lewis (Bramblehead); 3, G. Bell (Bristol Shubunkin); 4, E. R. Metcalf (Vivid); Native and Foreign: 1, V. B. Hunt (Pumpkinseed); 2, S. and N. Lewis (Golden Tench); 3, S. and N. Lewis (Bitterling); 4, Mrs. M. Franklin (Godgown); Centrarchids: 1, V. B. Hunt (Banded Sunfish)—Best in Show; 2, V. B. Hunt (Blue Spotted Sunfish); 3, Mrs. M. Dudley (Pumpkinseed); 4, E. Franklin (Lepomis Huminal); Koi: 1, D. Herman (Sanke); 2, S. and N. Lewis (Ki-Goi); 3, D. Herman (Gin Rin Shirobaku); 4, D. Herman (Doitsu-Chagon).

Plant—Rooted (A.O.S.): 1, Mrs. M. Dudley (Willow Moss); 2, T. Jacques (Willow Moss); 3, K. Seaton (Water Onion); 4, R. Barrie (Acorus Gramineus Variegata); Cuttings: 1 and 2, S. Herring (Hareswort); Floating (Section 1): 1, D. and P. Lambert (Azolla); 2, Mrs. M. Dudley (Duckweed); 3, S. Herring (Duckweed); 4, Mrs. M. Dudley (Azolla); Floating (Section 2): 1, S. Herring (Water Hyacinth); 2, A. J. Fuller (Water Lettuce); 3, Mrs. M. Franklin (Water Hyacinth); Floating (Section 3): 1, Mrs. M. Dudley (Water

Chestnut); 2, Mrs. M. Franklin (Water Chestnut); 3 and 4, S. Herring (Salvinia); Best Fish in Show and Aquarist Gold Pin: Vernon Hunt; Best Basic Variety (Goldfish): G. Lewis (Bramblehead); Best Popular Variety (Goldfish): J. Pollard (Oranda).

Founded in 1967, South Park Aquatic (Study) Society specialises in coldwater fish and meets at 8 p.m. on the third Tuesday of every month at the Wimbledon Community Centre, St. George's Road, London S.W.19. New members and visitors always welcome. Full details available from Mrs. M. Dudley, Secretary, 163 South Park Road, Wimbledon, London S.W.19 8RX. Tel: 01-540 5662.

Kingston and District A.S. had their annual Pond Hunt on 2nd July. They chose a fine summer evening which brought out many club members and friends to the venue which was a small river at Walton, Surrey. There did not seem to be quite as much livestock in the river as on previous years, but nevertheless a great variety was caught. The evening was rounded off with a barbecue by the river. At the Club meeting on 16th July a table show of pond catches was held, the exhibits ranging from fish and plants to water beetles and newts. First place was taken by a minnow followed closely by a water beetle. The Club is holding another Biting and Bury on 17th September from 5 p.m. at their usual venue, Raynes Park Methodist Church Hall, Worples Road, Raynes Park, S.W.20. All are cordially welcomed to this event, as are any visitors or prospective new club members. Meetings are held on the first and third Thursdays every month. (Telephone: 01-597 4490).

At the July meeting of the **East Kent Aquatic Study Group**, members were given an informative talk by Mr. Lester Hovenden, a former member of the Society, on "The Evolution of Reptiles and Amphibians".

The table show, also for Reptiles and Amphibians, contained 23 entries, ranging from Terrapins to Snakes. Mr. Andrew Amos, who judged the entries, commented on the high standard and condition of all the animals. He awarded cards for the four best entries: 1, L. Spooce; 2, D. Hills; 3, N. Amos; 4, A. Haselden. Also there was a competition for aquatic plants. This attracted 11 entries and resulted: 1, R. Matthews; 2, P. Saxby; 3, J. Edwards; 4, J. Edwards. The judge for this section was Mr. John Gilbert.

At the July meeting of **Mid-Sussex A.S.** Mr. Standford gave a lecture on "Food for fishes." A very good show of slides of live food and fishes found in ponds. Result of table show: L.A.: 1, T. Piggley; 2, B. Hards; L.Z.: 1, A. Parson; J.: 2 and 3, J. Perrin; J.: 4, P. Levine; F: 1, 2, 3 and 4, A. and J. Fall. Meetings held every 2nd Tuesday of each month at 8 p.m. at Oakley Lodge, Oakley Lane, Keymer. Secretary, J. Smith, 51 Eastbourne Road, Brighton BN1 6QZ.

THE 1981 Romford and Becontree A.S. open show proved to be a great success with 324 entries. The Society wishes to express its thanks to the judges. Special thanks are also given to all the companies who donated prizes, especially Mr. Sam Brey, of S.E.A. Bray Aquarists Ltd., who donated an Aquarium for the raffle prize.

Results of the Show: Class Ag: 1, P. Mills (WDAS); 2, T. Waller (SLAG); 3 and 4, P. Victory (Rom); S: 1, W. Hastings (SELAS); 2, A. Waller (BG&I); 3, J. Pitt (Rom); 4, S. Buck (Rom); C: 1, J. Pitt (Rom); 2, P. Riley (BG&I); 3 and 4, M. Smith (Rom); Cal: 1, J. Pitt (Rom);

2, J. Pitt (Rom); 3 and 4, P. Riley (BG&I); D: 1, W. Hastings (SELAS); 2, J. Pitt (Rom); 3, G. Moore (Rom); 4, T. Malby (Rom); Ds: 1, G. Steptow (Rom); 2, W. Hastings (SELAS); 3 and 4, M. Smith (Rom); Dr: 1 and 2, G. Steptow (Rom); 3, J. Pitt (Rom); 4, M. Howells (ELAPA); E: 1, W. Hastings (SELAS); 2, J. Risk (Rom); 3, P. Riley (BG&I); 4, G. Smith (WDAS); Ec: 1, J. Pitt (Rom); 2 and 4, J. Pitt (Rom); 3, P. Victory (Rom); F: 1 and 2, M. Smith (Rom); 3, P. Riley (BG&I); 4, J. Pitt (Rom); G: 1 and 3, J. Adams (Rom); 2, J. Pitt (Rom); 4, W. Hastings (SELAS); H: 1 and 2, J. Adams (Rom); 3, E. Ward (Rom); 4, W. Hastings (SELAS); Hs: 1, W. Hastings (SELAS); 2, A. Chapman (Newham); 3, G. Steptow (Rom); 4, J. Pitt (Rom); J: 1, W. Hastings (SELAS); 2, J. Pitt (Rom); 3, M. Smith (Rom); 4, J. Risk (Rom); K: 1, P. Chapman (Newham); 2, W. Hastings (SELAS); 3, J. Pitt (Rom); 4, G. Steptow (Rom); L: 1, 2 and 3, J. Compton (Rom); 4, J. Adams (Rom); M: 1, J. Pitt (Rom); 2, J. Pitt (Rom); 3, M. Smith (Rom); 4, J. Risk (Rom); K: 1, P. Chapman (Newham); 2, W. Hastings (SELAS); 3, J. Pitt (Rom); 4, G. Steptow (Rom); N: 1, 2 and 3, J. Compton (Rom); 4, J. Adams (Rom); M: 1, J. Pitt (Rom); 2, J. Pitt (Rom); 3, P. Mills (WDAS); 4, J. Risk (Rom); O: 1, P. Chapman (Newham); 2 and 3, J. Pitt (Rom); 4, J. Brown (BG&I); P: 1 and 3, J. Pitt (Rom); 2 and 4, E. Ward (Rom); Q: 1, A. Waller (BG&I); 2, E. Ward (Rom); 3, W. Hastings (SELAS); 4, E. Ward (Rom); R: 1, J. Pitt (Rom); 2, W. Hastings (SELAS); 3, P. Chapman (Newham); 4, A. Chapman (Newham); S: 1, P. Chapman (Newham); 2, G. Steptow (Rom); 3, A. Waller (BG&I); 4, G. Moore (Rom); T: 1, W. Hastings (SELAS); 2, M. Smith (Rom); 3, P. Riley (BG&I); 4, P. Mills (WDAS); U: 1, S. Brown (ELAPA); 2, J. Pitt (Rom); 3, P. Whiddett (Tonbridge); 4, J. Compton (Rom); V: 1 and 4, S. Brown (ELAPA); 2 and 3, B. Compton (Rom); W: 1 and 3, P. Mills (WDAS); 2 and 4, G. Steptow (Rom); XBM: 1, J. Pitt (Rom); 2 and 3, G. Smith (WDAS); 4, E. Ward (Rom); XOT: 1, T. Waller (SLAG); 2, W. Hastings (SELAS); 3, E. Ward (Rom); 4, P. Mills (WDAS); Y: 2, 1, G. Smith (WDAS); 2, 1 and 4, P. Mills (WDAS); Junior Tropical: 1 and 3, Miss Karen Pitt (Rom); 2, Colin Brown (BG&I); 4, Andrew Waller (BG&I); Junior Coldwater: 1, Colin Brown (BG&I); 2, Andrew Waller (BG&I); 3, Miss J. Waller (BG&I); Best Fish in Show: G. Steptow (Rom); Neosacara Taenia, Best Cichlid: G. Steptow (Rom); Neosacara Taenia, Best F.A.A.S. Championship trophy Class U: Mrs. S. Brown (ELAPA) Common Goldfish. Highest pointed visiting society: S.E. London A.S.

SOUTH WEST



THE Nailsea & District A.S. eighth open show at Clevedon Community Centre proved to be one of the most successful yet, attracting 504 entries (about 150 up on last year). The entries came from 30 clubs from this county and the Continent.

Results: Guppies (Male): 1, Mrs. B. May (Reading); 2, C. Cox (Yeovil); 3, R. T. Stallwood (Newbury); 4, C. Tonna (Reading); Guppies (Female): 1 and 2, L. H. Gregory (Castle L.A.S.); 3 and 4, D. Cox (Yeovil); Planted: 1, M. and P. Davis (Tretton); 2, H. J. Koppel (Dunstable); 3, A. Phillips (Tretton); 4, R. G. Yerton (Fymouth); Swordtails: 1, Mrs. S. Jones (Rhonda); 2, Mrs. P. Cripps (Newbury); 3, C. Tonna; 4, 1 and K. Gilbert (Mineside); Molies: 1 and 3, M. Taylor (South Wilt); 2, P. Andrews (Bracknell); 4, P. Bond (Yeovil); Alfaro/Centrarchid/Jonysia/Prisepella/Girardinus: 1, 3 and 4, Hans

Large Barbs: 1, Mr. and Mrs. M. Kemp (Sheaf Valley) and Y.A.A.S. Star award; 2, A. Marples; 3, Mr. and Mrs. L. Pickford. Small Characins: 1, F. Lane; 2, Miss J. Lee; 3, Mr. and Mrs. Dixon. Large Characins: 1, R. M. Smithurst and Sons; 2, D. Moody (Grimsby and Cleeth); 3, R. Loukes (Grimsby and Cleeth). Small Cichlids: 1 and 3, Mr. Bee (Grimsby and Cleeth); 2, R. M. Smithurst and Sons. Large Cichlids: 1, Mr. and Mrs. Silk (Sheaf Valley); Y.A.A.S. Star award; 2, K. M. Fisher (Shearwood); 3, G. Newman (Gad). Angels and Discus: 1, Mr. and Mrs. Hare; 2, R. M. Smithurst and Sons; 3, Mr. and Mrs. M. Parrow. Rift Valley: 1 and 2, K. M. Fisher (Shearwood); 3, R. M. Smithurst and Sons. Fighters: 1 and 3, F. S. Draycott and Sons; 2, Mr. and Mrs. Brackenbury (Ashby). Small Anabantids: 1, R. M. Smithurst and Sons; 2, R. Kiley (Grimsby and Cleeth); 3, D. Moody. Large Anabantids: 1 and 2, Mr. and Mrs. F. Howell; 3, Mr. and Mrs. Mitchell (Workop). Corydoras and Botos: 1, Mr. and Mrs. F. Howell and Y.A.A.S. Star award; 2, Miss J. Lee; 3, S. Osborn (Grimsby and Cleeth). Small A.O.V. Catfish: 1, Mr. and Mrs. P. Howell; Y.A.A.S. Star award and Best in Show; 2, V. R. Black (Caistor); 3, L. Turworth (Grimsby and Cleeth). Large A.O.V. Catfish: 1, Mr. and Mrs. Gellard (Sheaf Valley); Y.A.A.S. Star award; 2, Mr. and Mrs. Fisher (Shearwood); Y.A.A.S. Star award; 3, Mr. and Mrs. Pickford (Caistor). Y.A.A.S. Star award. Sharks and Foxes: 1, Mr. and Mrs. M. Kemp (Sheaf Valley); Y.A.A.S. Star award; 2, Mr. and Mrs. P. Howell (Doncaster); 3, Mr. and Mrs. D. Mitchell. Loaches and Botias: 1, S. Osborn; 2, D. Moody; 3, Mr. and Mrs. P. Howell. Rabbits: 1, Mr. and Mrs. Lake (Grimsby and Cleeth); 2, Miss J. Lee; 3, Mrs. Marples (A&D). Danios and Minnows: 1, Mr. and Mrs. Lake (Grimsby and Cleeth); 2, Mr. and Mrs. Brackenbury (Ashby); 3, D. Moody. Apistogramms: 1, A. Palmer (Hullcroft); 2 and 3, F. S. Draycott and Sons. A.O.V. Killifish: 1, Mr. and Mrs. Culley (Ashby); 2, Mr. and Mrs. L. Pickford (Caistor); 3, L. Turworth (Grimsby and Cleeth). Small A.O.V. Tropical: 1 and 2, Mr. and Mrs. P. Howell; 3, Miss J. Lee. Large A.O.V. Tropical: 1, Mr. and Mrs. P. Howell (Doncaster); 2, Mr. and Mrs. P. Howell (Eggley); 3, Mr. and Mrs. L. Pickford. Junior (Eggley): 1 and 3, A. Palmer (Hullcroft); 2, Miss L. Wilson (Grimsby and Cleeth). Junior (Livebearer): 1, Miss E. Marples (A&D); 2, M. and N. Hancock (Hullcroft); 3, Miss L. Wilson (Grimsby and Cleeth). Breeders (Eggley): A & B: 1, Mr. and Mrs. L. Pickford; 2, Mr. and Mrs. Silk; 3, F. S. Draycott and Sons. Breeders (Eggley): C & D: 1, 2 and 3, R. Todd. Breeders (Livebearer): A & B: 1, Miss J. Lee; 2, A. Marples; 3, R. M. Smithurst and Sons. Breeders (Livebearer): C & D: 1 and 3, Mr. and Mrs. Hancock (Hullcroft); 2, C. Womack (Ind.). Goldfish and Comets: 1, Mr. and Mrs. Silk; 2, Mr. and Mrs. K. Allard (A&D). Shubunkins and Fancy Goldfish: 1 and 2, Mr. and Mrs. Silk; 3, B & G (Grimsby and Cleeth). A.O.V. Goldfish: 1, C. Mattheron (Grimsby and Cleeth); 2, Mr. and Mrs. Silk; 3, Mrs. Marples. Pairs (Eggley): 1, D. Howard (Grimsby and Cleeth); 2, D. Moody; 3, Mr. and Mrs. Lake. Pairs (Livebearer): 1, Mr. and Mrs. P. Howell; 2, C. Womack; 3, P. Lane. Females (Eggley): 1, Mr. and Mrs. P. Howell; 2, Mr. and Mrs. Silk; 3, L. S. Johnson (Wyke). Females (Livebearer): 1, L. S. Turworth (Grimsby and Cleeth); 2, Miss L. Wilson; 3, Miss J. Lee.

MIDLANDS AND WALES



THE Midland Association of Aquarists Societies would like to welcome the following new societies into the Association: Banbury A.S., Hinckley D.A.S., East Leicester, North Staffs. and Wolverhampton A.S., and wish them every success for the future. Any Society interested in joining M.A.A.S. or needing any further information should contact the M.A.A.S. Secretary,

Mr. Alan Dickinson, 3, Tavistock Close, Perry-cocks, Tamworth, Staffs.

NORTH



THURSDAY, 16th June, was the date for the fourth Statesman League match of the season. Wyke Show Society was the host at the Newland Orphan Homes, Cottingham Road, Hull. Scarborough A.S. supplied the judges with the following results: Bradford A.S., 60 points; Wyke Show Society, 58; Hull, 51; York, 50; and Ebor, 12; leaving the league table as follows: Hull, 215 points; Scarborough, 185; Bradford, 182; York, 129; Wike, 105; Ebor, 92.

With such a close finish the remaining two matches, at Ebor on the 30th September and Bradford on the 28th October, will be keenly contested.

THE June meeting of the Northwick & District A.S. at the Winstanley & Cartle Friends Club, Barbers Lane, off Queensgate Castle, was attended by members of Wrexham, Warrington, Macleodfield & Hoylake Societies. The lecture by Dave Sander on his trip to Brazil, kept the audience fully entertained as he related the excellent slides to his very interesting experiences. Questions generated an insight into the temperature, pH, salinity and spawning habits of the specimens shown on the slides. An auction of surplus plants and fish was held.

WINNERS at St. Helens A.S. Open Show at Rainhill Village Hall. A total of 444 entries made it a very successful show: Guppies: 1, J. Coulton (St. Helens); 2, K. Buckley (Redgrave); 3, J. Byrne (Skew). Platies: 1, P. Banks (St. Helens); 2, J. Lynch (Merseyside); 3, J. T. Morris (Sandgrounders). Mollies: 1, J. Roberts (Oldham); 2, H. Peet (St. Helens); 3, Mr. and Mrs. Slater (Blackpool). Swordtails: 1 and 2, T. L. Penry (St. Helens); 3, K. Corbett (Merseyside). A.O.V. Livebearers: 1, Mr. and Mrs. Ratough (Sandgrounders); 2, P. Harris (St. Helens); 3, J. Dean (St. Helens). Small Anabantids: 1, Mrs. L. Morris (Sandgrounders); 2, M. Hartley (Sandgrounders); 3, Mr. and Mrs. Underwood (Bridgeview). Large Anabantids: 1 and 2, Mr. and Mrs. Underwood; 3, A. Bibby (Sandgrounders). Fighters (Cambodia): 1, B. W. Carter (St. Helens). Fighters (Multi-Coloured): 1, P. Harris; 2, Mrs. J. Morris (Hoylake); 3, E. Naylor (St. Helens). Small Barbs: 1, B. W. Carter; 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Baldwin (Sandgrounders). Large Barbs: 1, Mr. and Mrs. Baldwin; 2, J. Lynch; 3, J. Roberts (Nelson). Dwarf Cichlids: 1 and 2, Mr. and Mrs. Underwood; 3, P. Harris. Large Cichlids: 1 and 2, Mr. and Mrs. Underwood; 3, M. Hartley. Rift Valley Cichlids: 1, Mr. and Mrs. Waterhouse (Merseyside); 2, Mr. and Mrs. Norton (Sandgrounders); 3, Mr. and Mrs. Underwood. Angels: 1, K. Buckley (Redgrave); 2, Mr. and Mrs. Stephenson (Oldham); 3, Mr. and Mrs. Slater (Blackpool). Small Characins: 1, Master G. Ratough (Sandgrounders); 2, Mr. and Mrs. Baldwin; 3, Mrs. L. Morris (Sandgrounders). Large Characins: 1, Master G. Ratough (Sandgrounders); 2, Mr. and Mrs. Underwood; 3, Master P. Slater (Blackpool). Toothcarps (Top Spawners): 1, K. Buckley; 2 and 3, Mr. and Mrs. Waterhouse (Merseyside). Toothcarps (Bottom Spawners): 1, K. Buckley; 2 and 3, H. Jones (Atherton North-West). Danios: 1, Mr. and Mrs. Baldwin; 2, J. Lynch (Merseyside); 3, Miss L. Roberts (Nelson). Rabbits: 1, J. Corbett (Merseyside); 2, T. McCarty (St. Helens); 3, Mr. and Mrs. Store (Oldham). Minnows: 1 and 2, Mr. and Mrs. Baldwin; 3, B. W. Carter (St. Helens). Corydoras and Botos: 1, J. Lynch; 2, J. T. Morris; 3,

Mr. and Mrs. Kenyon (Sandgrounders). A.O.V. Catfish: 1 and 2, J. T. Morris; 3, Mr. and Mrs. Underwood. Sharks: 1 and 2, Mr. and Mrs. Underwood; 3, Mr. and Mrs. Stephenson (Oldham). Foxes: 1, Mr. and Mrs. Stephenson; 2, Mr. and Mrs. Kenyon; 3, Mr. and Mrs. Baldwin. Loaches: 1, Mr. and Mrs. Underwood; 2 and 3, Mr. and Mrs. Baldwin. A.O.V. of fish: 1, Mr. and Mrs. Baldwin; 2, K. O'Rourke (Oldham); 3, Mr. and Mrs. A. L. Morris (Sandgrounders). Pairs (Eggley): under 3in.: 1, B. W. Carter (St. Helens); 2, Mr. and Mrs. Baldwin; 3, J. T. Morris. Pairs (Eggley): over 3in.: 1, M. and N. Rimmer (Sandgrounders); 2, Mr. and Mrs. Casey (Blackpool). Pairs (Livebearers): 1, J. Corbett (Merseyside); 2, P. Harris (St. Helens); 3, M. and N. Rimmer (Sandgrounders). Breeders (Livebearer): 1-10: 1, E. Birchwood (Oldham); 2, K. Buckley; 3, Mr. and Mrs. Chadwick (Oldham). Breeders (Livebearers): 11-20: 1, K. Buckley; 2, Mr. and Mrs. Chadwick (Oldham). Breeders (Eggley): 1-10: 1, J. Dean (St. Helens); 2, Mr. and Mrs. Store (Oldham); 3, J. T. Morris. Breeders (Eggley): 11-20: 1, K. Corbett (Mersey); 2, E. Jones (Ath N.W.); 3, K. Buckley. Breeders (Goldwater): 1-10: 1, Mrs. Store (Oldham); 2, Mr. and Mrs. Underwood; 3, J. Lynch. Shubunkins: 1, Mr. and Mrs. Underwood; 2, A. and E. Berry (Redgrave); 3, K. Berry (Redgrave). A. V. Tropical: 1 and 2, Mr. and Mrs. Underwood; 3, L. Whoraker (Redgrave). A.O.V. Goldwater: 1, M. Hartley (Sandgrounders); 2, J. Lynch; 3, A. and E. Berry. Marine any variety: 1 and 2, B. Leyland (St. Helens); 3, P. Banks (St. Helens). Ladies any variety: 1, Mrs. S. Underwood; 2, Mrs. Kenyon (Sandgrounders); 3, Mrs. C. Buckley (Redgrave). Mini-Jars: 1 and 2, Mr. and Mrs. Stephenson. Junior (Goldwater): 1, Miss J. Baldwin (Sandgrounders); 2, Master D. Hartley (Sandgrounders); 3, Miss J. Penry (St. Helens). Junior (Livebearer): 1, Master S. Waterhouse (Merseyside); 2, L. and M. Buckley (Redgrave); 3, K. Corbett (Junior Eggley); 1, Miss J. Baldwin; 2, Master P. Underwood (Redgrave); 3, Master J. Coulton (St. Helens). Best Fish in show: Rift Valley Cichlid, owned by Mr. and Mrs. A. Waterhouse (Merseyside) A.S. Best pair in show: Corydoras Pygmaea, owned by Mr. B. W. Carter of St. Helens A.S. Best Breeders: K. Corbett of Merseyside A.S.

Hinckley & District Aquarium Society meet at the Railway Hotel, Hinckley at 8 o'clock. Everyone welcome. Wednesday 13th August. Slide Show, Wednesday, 9th September. Table Show A.V. Tropical.

THE British Discus Association started back in 1975, partly by the devotion and contributions of Frank Ashworth, who over the years has kept and bred discus, has grown from a handful of keen enthusiasts to over 300 members, and is still growing. Even the name "Discus" is interesting and makes people enquire over this very popular but still expensive fish. To many this true king of the aquarium still poses more questions than answers. It is part of the B.D.A.'s policy to help and pass on information so that problems can be solved, failures for one member can stop another following the footsteps to disaster. Hopefully in the next few years Discus will be as popular as Angelfish as more information is published in what was an unknown field. Unfortunately Discus don't always like their local tap water. Water conditions play a big part although as more tank-bred fish are raised, they should slowly adapt to greater water tolerances. The American discus breeders now have fish which can tolerate a water chemistry such as a pH 6.4-7.6 and a DH up to 24 and sometimes higher. Unless you are totally familiar with discus and know their limits this is not recommended. Unlike most who start by saying discus are hard to keep and breed, the reverse is usually found. It has been proved they are very hardy and can tolerate slow temperature pH and DH changes at both ends of the scale for short times. In some cases panic seems to set in at the first sign of trouble. People throw every known chemical in instead of thinking or asking a local breeder. Killing with kindness is so common in this hobby.

Part of the new committee of the B.D.A. has been appointed to help in the above, with area representatives willing to assist with problems and ideas. The news letter, which was first started in 1975, has been altered to a quarterly news journal and contains information from members, advice service from Dr. D. Ford and Dr. C. Andrews. It has been published to assist with a reference page on books which can be obtained with discus information and literature available, being updated on every edition. For sale, exchange and wanted is always advertised

for members to assist with obtaining stock, and selling.

There are people who are still unaware of some of the above, and have not known the experience of resistance of the B.D.A. and its running, but with this article we hope to assist and answer some of the unsolved questions. For further information please contact the secretary, R. Maudsley, 102 Meadow Street, Preston, Lancashire. Tel: Preston 28813.

RESULTS of the Sandgrounders A.S. 11th annual open show, held at Meris Cop High School, Meris Cop Road, Southport, on 19th July:

Guppies: 1, B. W. Carter (St. Helens); 2, Mrs. Cook (Blackpool); 3, Mr. Laverant (Ind.). **Swordtails:** 1 and 2, J. L. Patten (St. Helens); 3, K. Corbett (Merseyside). **Platies:** 1, Mr. and Mrs. Stephenson (Oldham); 2, J. Lynch (Merseyside); 3, A. Bibby (Sandgrounders). **Mollies:** 1, J. Roberts (Nelson); 2, Mr. and Mrs. Pate (St. Helens); 3, I. Dinwale (Blackpool). **A.O.V. (Livebearers):** 1, K. Buckley (Bridgewater); 2, Mr. and Mrs. Slater (Blackpool); 3, Mr. and Mrs. Waterhouse (Merseyside). **Small Anabantids:** 1, Mr. and Mrs. A. L. Morris (Sandgrounders); 2, A. Darby (Preston); 3, M. Harley (Sandgrounders). **Large Anabantids:** 1 and 2, Mr. and Mrs. Underwood (Bridgewater); 3, J. Lynch (Sussex Fighters). **Siamese Fighters:** 1, P. Harris (St. Helens); 2, I. Dinwale; 3, B. W. Carter (St. Helens). **Small Goldfish:** 1, P. Harris (St. Helens); 2 and 3, Mr. and Mrs. Underwood (Bridgewater); 1, J. Lynch; 2, Mr. and Mrs. Underwood; 3, Mr. Fountain (Runcorn). **Riff Valley Goldfish:** 1, Mr. and Mrs. Waterhouse; 2, Mr. and Mrs. H. Cooper (Bury); 3, Mr. and Mrs. Stephenson; 2, Mr. and Mrs. Slater. **Small Chanchis:** 1 and 2, G. Estough (Sandgrounders); 3, E. B. Calow (Bridgewater). **Medium Chanchis:** 1, Mr. and Mrs. B. Baldwin (Sandgrounders); 2, P. Slater; 3, Mr. and Mrs. A. Waterhouse (Large Chanchis). **Large Chanchis:** 1, Mr. and Mrs. Underwood; 2, Rene Houghton; 3, B. W. Carter. **Small Barbs:** 1, Mr. and Mrs. B. Baldwin; 2, A. Bibby (Sandgrounders); 3, G. Estough. **Large Barbs:** 1, Mr. and Mrs. Underwood; 2, Mr. and Mrs. Baldwin; 3, J. Roberts (Nelson). **Rashoras:** 1, A. Waterhouse; 2, J. Corbett; 3, Mr. and Mrs. J. Kenyon (Sandgrounders). **Minnows:** 1, Mr. and Mrs. B. Baldwin; 2, Mr. and Mrs. Underwood; 3, B. W. Carter. **Danos:** 1, D. Hartley (Sandgrounders); 2, J. Lynch; 3, Mr. and Mrs. Casey (Blackpool). **Corydoras and Brochis:** 1, P. Harris; 2, Mr. and Mrs. Waterhouse; 3, Mr. and Mrs. Baldwin. **Sucker-mouth Catfish:** 1, Mr. and Mrs. Waterhouse; 3, E. B. Calow; 3, D. Harvey (Sandgrounders). **Synodontis Catfish:** 1, Mr. and Mrs. A. Waterhouse; 2, Mr. and Mrs. B. Baldwin; 3, Mr. and Mrs. Underwood. **A.O.V. Catfish:** 1, Mr. and Mrs. Waterhouse; 2 and 3, J. T. Morris (Sandgrounders). **Loaches:** 1, Mr. and Mrs. Handa (Accrington); 2, J. Lynch; 3, Mr. and Mrs. Underwood. **Sharks:** 1, Mr. and Mrs. Stephenson (Oldham); 2, Patrick Gelston (Sandgrounders); 3, Mr. and Mrs. Underwood. **Flying Fish:** 1, Mr. and Mrs. Stephenson; 2, K. Buckley (Bridgewater); 3, Mr. and Mrs. Kenyon. **Goldfish:** 1 and 2, E. Jones (Atherton N.W.); 3, Mr. and Mrs. H. Cooper (Bury). **A.V. Female Fish:** 1, E. B. Calow; 2, Mr. and Mrs. Beiers (Blackpool); 3, S. Waterhouse (Merseyside). **Fans (Livebearers):** 1, P. Harris; 2, Mr. and Mrs. Underwood; 3, J. Corbett. **Fans (Egglayers):** 1, A. B. Berry (Bridgewater); 2, M. Hartley (Sandgrounders); 3, Mr. and Mrs. A. Waterhouse. **Brooders (Livebearers):** 1-10: 1, K. Buckley; 2, J. Corbett; 3, A. E. Berry (Bridgewater). **Brooders (Egglayers):** 11-20: 1 and 2, Mr. and Mrs. Chadwick (Oldham). **Brooders (Egglayers):** 1-10: 1, W. Drake (Bury); 2, J. T. Morris (Sandgrounders); 3, D. Hulse (Oldham). **Brooders (Egglayers):** 11-20: 1, K. Corbett; 2, K. Buckley; 3, E. Jones (Atherton N.W.). **A.O.V. Tropical:** 1, Mr. and Mrs. Underwood; 2 and 3, Mr. and Mrs. B. Baldwin. **Common Goldfish and Comets:** 1, A. Waterhouse (Merseyside); 2, Mr. and Mrs. Underwood; 3, Mr. Fountain (Runcorn). **Stunbunkins:** 1, A. E. Berry (Bridgewater); 2, S. Walsh (Accrington); 3, Mr. and Mrs. Casey (Blackpool). **Fennals:** 1, C. Wallbank (Accrington); 2, Mr. and Mrs. Colby (Oldham); 3, C. H. Whitely (Accrington). **A.O.V. Goldwater (Single Tail):** 1, Mr. and Mrs. Underwood; 2 and 3, D. Harvey (Sandgrounders). **A.O.V. Goldwater (Twin Tail):** 1, J. Buncher (Merseyside); 2, C. H. Whitely; 3, Mr. and Mrs. Colby. **Liocobas:** 1, S. Walsh; 2, Mr. and Mrs. Weaver; 3, Mr. and Mrs. Harvey (Sandgrounders). **Juniors (Livebearers):** 1, K. Corbett; 2, A. M. Buckley (Bridgewater); 3, M. Kinsey (Sandgrounders). **Juniors (Egglayers):** 1, J. Baldwin (Sandgrounders); 2, S. Fountain (Runcorn); 3, D. and M. Beiers (Blackpool). **Juniors (Goldwater):** 1, Miss J. Baldwin (Sandgrounders); 2 and 3, A. Chadwick (Oldham). **Ladies Fish (Any Variety):** 1, Mrs. S. Underwood; 2, Mrs. Waterhouse; 3, Mrs. Beiers. **Marines:**

1, S. Jones (St. Helens); 2 and 3, B. Leyland (St. Helens). **Furnished Mini-Tars (No Fish):** 1 and 3, Mr. and Mrs. Stephenson; 2, B. W. Carter. **Best Fish in Show:** All-glass tank with accessories, *Aquari* & Pondkeeper Gold Label Pin, Entry into Champion of Champions Contest, Top Tank Prize Money, The Iddon Trophy; Mr. and Mrs. A. Waterhouse (Merseyside). **A.S. Open Class:** Society with Most Points: (The Bernard Coburn Trophy); Bridgewater. Society with Most Entries (The Kingway Cannon Punch Bowl); Bridgewater. Exhibitor with Most Points (The Fish Pad Trophy); Mr. and Mrs. Underwood. **Top Tank Prize Money (Pair Class):** P. Harris (St. Helens). **Brooders Class:** K. Corbett (Merseyside). **Total number of entries in Show:** 610.

SCOTLAND



Amble & District A.S. first open show. Results: **Best Fish in Show:** Mr. and Mrs. Barrow (Car Ural); **Best Exhibitor:** F. Bell (Stanley); **Barb:** 1 and 2, H. Prosser (H); 3, Mr. and Mrs. Barrow (CU); 4, G. Jacobs (T); **Bel:** 1, S. Murray (B); 2, T. Sayers (S); 3, T. Ogden (BM); 4, D. Dawson (AP); **Car:** 1, D. Dawson (AP); 2, F. Bell (S); 3, A. Venas (T); 4, W. Hornby (BA); **C:** 1, J. Pringle (S); 2, B. Scott (B); 3, Kennard family (A); 4, D. Rennie (T); **D:** 1 and 2, H. Prosser (H); 3, Mr. and Mrs. Wardle (BA); 4, G. Tompsett (S); **Dp:** 1, T. Sayers (S); 2, D. Dixon (S); 3, W. Hornby (BA); 4, Mr. Dodd (BA); **Dc:** 1, Mr. and Mrs. Wardle (BA); 2, Mr. Luky (T); 3, Mr. and Mrs. Jennings (Ind.); **Dl:** 1, Mr. Dodd (BA); 2, Mr. and Mrs. Wardle (BA); 3, G. and M. Parkin (B); 4, S. Murray (B); **Dr:** 1 and 2, T. Sayer (S); 3, Mrs. J. Carter (Ind.); 4, J. Gardner (B); **E:** 1, W. Hornby (BA); 2, H. Hargreaves (S); 3, D. Dixon (S); 4, P. Wright (CU); **F:** 1, H. Hargreaves (S); 2, F. Bell (S); 3, P. Wright (CU); 4, P. Roe (BA); **G:** 1, F. Bell (S); 2, P. Wright (CU); 3, P. Fry (SS); 4, K. Armstrong (A); **H:** 1 and 2, P. Fry (SS); 3, L. Embleton (AP); 4, I. Henderson (A); **I:** 1 and 3, D. Dawson (AP); 2, S. Murray (B); 4, H. Lake (S); **K:** 1, P. Kelly (T); 2, T. Ogden (BM); 3, W. Hornby (BA); 4, N. Forster (BA); **L:** 1, H. Hargreaves (S); 2, Mr. and Mrs. Herron (AP); 3, P. Fry (SS); 4, Mr. and Mrs. Pringle (A); **M:** 1, J. Carter (Ind.); 2, H. Hargreaves (S); 3, P. Roe (BA); 4, G. and M. Parkin (B); **M:** 1 and 2, F. Bell (S); 3, Mr. and Mrs. Barrow (CU); 4, J. and M. Armstrong (B); **N:** 1, D. Dawson (Arnheld Pans); 2, P. Roe (BA); 3, H. Lake (S); 4, Mr. and Mrs. Barrow (CU); **Not:** 1, Mr. and Mrs. Herron (AP); 2, P. Wright (CU); 3, P. Kelly (T); 4, D. Dawson (AP); **O:** 1 and 4, D. Dawson (AP); 2, P. Fry (SS); 3, D. Parker (A); **P:** 1, F. Bell (S); 2, P. Fry (SS); 3, I. Clow (A); 4, D. Parker (A); **Q:** 1, J. Tomson (Ind.); 2, M. and N. Armstrong (S); 3, I. Clow (A); **R:** 1, F. Bell (S); 2 and 4, P. Roe (BA); 3, Mr. and Mrs. G. Hunt (New); 5, 1, P. Kelly (T); 2 and 4, P. Roe (BA); 3, D. Honey (AP); **T:** 1, Mr. and Mrs. Barrow (CU); 2, N. Forster (BA); 3, W. Hornby (BA); 4, P. Bell (S); **X:** 1, P. Fry (SS); 2, I. Ponsley (S); 3, F. Bell (S); 4, D. Dixon (S); **Xc:** 1, T. Sayers (S); 2, D. Dixon (S); 3, F. Bell (S); 4, P. Wright (CU); **X:** 1, F. Bell (Stanley).

RESULTS of the Arbroath A.S. open show: **Guppies (Male):** 1, J. Wells (D); 2, E. Marnock (Ab); 3, J. Milligan (B); 4, A. Morrison (P). **Guppies (Female):** 1 and 2, A. Bell (Ma); 3, C. Bine (Mo); 4, P. Morrison (P). **Swords (Male):** 1, 2, 3 and 4, R. Bell (Ma). **Swords (Female):** 1, M. Gilchrist (S); 2, J. Mitchell (K); 3, D. Long (D); 4, G. Talbot (P). **Mollies (Male):** 1, D. Long (D); 2 and 3, V. Connor (Dc); 4, B. Houston (C). **Mollies (Female):** 1, M. Gilchrist (S); 2, A. Robb (A); 3, B. Houston (C). **Platies (Male):** 1, R. Bell (Ma); 2, J. Currie (D). **Platies (Female):**

1, M. Gilchrist (S); 2, J. Wells (D); 3, C. Duffas (Da); 4, J. Milligan (B). **A.O.V. Live (Male):** 1, G. Kacer (K); 2, A. White (K); 3, R. Harley (K); 4, J. Steven (A). **A.O.V. Live (Female):** 1, R. Harley (K); 2, B. Cunningham (P); 3, D. Stephen (K); 4, A. White (K). **Characin:** 1, A. Scott (N); 2 and 3, E. Ramsay (S); 4, D. Mitchell (K). **Characin:** 1 and 2, A. Scott (N); 3, D. Mitchell (K); 4, G. Talbot (P). **Characin:** 1, B. Cunningham (P); 2, D. Hill (Da); 3, A. Brown (BKA); 4, B. Budge (D). **Herb:** 1, D. Angus (Ab); 2 and 3, D. Hill (Da); 4, A. Longmuir (P). **Barb:** 1, 2 and 4, E. Mann (P); 3, D. Hill (Da). **Small Goldfish:** 1, A. Harrison (P); 2, J. Steven (A); 3, E. Marnock (Ab); 4, W. Brown (D). **Large Goldfish (O.V.):** 1, G. Smith (C); 2, J. McDonald; 3, L. Moor (A); 4, G. Talbot (P). **Large Goldfish (N.V.):** 1, A. Harrison (P); 2, K. Midlam (P); 3, D. Hunter (Ab); 4, A. Smith (C). **Siamese Fighters:** 1, D. Angus (Ab); 2, R. Shaw (A); 3, J. Ramsay (S); 4, B. Budge (D). **Trichogaster Sp.:** 1, D. Long (D); 2, G. Marshall (T); 3, P. Morrison (P); 4, J. Hamilton (P). **Goldfish:** 1 and 2, D. Watson (P); 3, J. Milligan (B); 4, H. Anderson (Da). **A.O.V. Gourami:** 1, M. Kyle (Da); 2, J. McCallum (P); 3, P. West (D); 4, J. Fettes (Ab). **Carr:** 1, 3 and 4, J. Makin (G); 2, H. Anderson (Da). **Carr:** 1, W. Brown (D); 2, S. Fleming (Da); 3, D. Laing; 4, J. Steven (A). **Loaches:** 1, M. Kyle (Da); 2 and 4, J. McDonald; 3, J. Mitchell (K). **Danos:** 1, A. Scott (N); 2, D. Mitchell (K); 3, C. Duffas (Da); 4, B. Norman (D). **Rashoras:** 1, E. Ramsay (S); 2, G. Talbot (P); 3, J. Fettes (Ab); 4, A. Scott (N). **Sharks:** 1, D. Hill (Da); 2, A. Longmuir (P); 3, G. Talbot (P); 4, B. Cunningham (P). **Minnows:** 1, E. Ramsay (S); 2, C. Hendry (D); 3 and 4, D. Hill (Da). **Goldfish:** 1, D. Angus (Ab); 2, A. Robinson (A); 3, W. Craigon (Ab); 4, A. Robertson (BKA). **A.O.S. Egglayer:** 1, D. Long (D); 2, M. Kyle (Da); 3, E. Mann (P); 4, R. Shaw (A). **Livebearers (Pair):** 1, R. Harley (K); 2, D. Long (D); 3, J. Hamilton (P); 4, J. Steven (A). **Brooders (Pair):** 1, A. Scott (N); 2, D. Dobie (D); 3, J. Steven (A); 4, A. Brown (BKA). **Brooders (Guppies):** 1 and 2, J. Wells (D); 3, A. Jenke (B). **Brooders (Platies):** 1, D. McCann (A); 2, J. Currie (D); 3, J. McCallum (P). **Brooders (Swords):** 1, D. McFarlane (S); 2, J. Wells (D). **Brooders (A.O.S.):** 1, A. White (K); 2, A. White (K); 3, E. Ramsay (S); 4, F. Connor (D). **Brooders (D):** 1, R. Shaw (A); 2, M. Gilchrist (S); 3, B. Budge (D); 4, C. Bine (Mo). **Brooders (N):** 1, J. Makin (G); 2, D. Long (D); 3, A. Brown (BKA); 4, D. Reid. **Brooders (B):** 1, W. Craigon (Ab); 2 and 3, R. Howe. **Common Goldfish:** 1, D. Anderson (SGG); 2 and 4, D. Milne (A); 3, N. Kendall (B). **Fancy Goldfish:** 1, J. Norrie (SGG); 2 and 3, D. Anderson (SGG); 4, D. Milne (A). **Shubunkin:** 1, 2, 3 and 4, J. Norrie (SGG). **A.O.S. Goldwater:** 1 and 2, J. Norrie (SGG); 3 and 4, E. Mann (P). **Platies:** 1, J. Fettes (Ab); 2, E. Ramsay (S); 3, A. Scott (N); 4, B. Budge (D). **Junior:** 1, 2 and 3, E. Ramsay (S); 4, J. Dobie (D). **Best Fish in Show:** A. Harrison (Forfar)—*Siameseur* contest.

Key to Societies: A—Arbroath; D—Dunfermline; E—Edinburgh; A R D; K—Kirkcaldy; N—Newburgh; S—Scottish; Ab—Aberdeen; Da—Dalkeith; F—Forfar; Ma—Monroev; P—Perth; SGG—Scottish Goldfish Group; C—Clyde; Da—Dundee; G—Glasgow; Mz—Muirhouse; S—Stirling. There were approximately 420 entries.

Paisley & District A.S. held its a.g.m. in Paisley Museum, and the following officers-barely were elected for the next two years: **President:** Mr. T. Currie, **Vice-President:** Mr. I. Davidson; **Secretary:** Mr. P. J. Kodas; **3 Rowan Street, Paisley, Renfrewshire PA2 8RG; Treasurer:** Mr. D. MacKay; **Show Manager:** Mr. I. Lennox; **Committee Member:** Mr. W. Dunbar. Mr. J. McGarran, a local tropical fish retailer, agreed to present the Club trophies for the year and the winners were as follows: **Senior League Award:** 1, W. Dunbar; 2, R. Brooking; 3, I. MacLennan; **Junior League Award:** 1, A. Patterson; 2, A. Findlay; 3, A. Johnston. **Champion of Champions:** 1, R. Brooking; 2, W. Dunbar; 3, I. Lennox. **Brooders Trophy:** J. Thomson. **Quiz Trophy:** J. Thomson. Also shown at the meeting were the entries for the Club Furnished Tank competition which consisted of 2 or 3 sides of each member's tank photographed during the session by treasurer D. MacKay. Mr. McGarran had the task of judging this closely fought contest and kindly donated three prizes for the winners. First place went to Mr. W. Dunbar for his well-planted community tank, consisting mainly of Tetras. The new committee has now arranged the syllabus for session 1991/2 and extends a cordial invitation to new members to come along to their meetings which are held on the 1st Tuesday of every month in Paisley Museum, High Street, Paisley at 7.30 p.m.

Dates for the diary

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

SEPTEMBER

- 5th & 6th September:** East Kent A.S.G. Public Exhibition of Fishkeeping, Lower Handley Village Hall, Nr. Canterbury, Kent. Further details from Bob Spooce (Tel: Canterbury 52382).
- 6th September:** Salisbury & D.A.S. annual open show to F.B.A.S. rules, at the Activity Centre, Wilson Road, Salisbury. Schedules from show Sec., D. Biddelein, 53 Somerset Road, Salisbury, Wilt. (Tel: 0722-26219) S.A.E. please.
- 8th September:** Banbury & District A.S. 1st Open Show at The Spicelab Arts and Community Association. Details from B. H. Hancock, 57 Lennox Gardens, Banbury, Oxon. Tel: Banbury 19925. (S.A.E. please).
- 8th September:** Bridgewater A.S. open show at St. George's Community Centre, Kenyon Way, Little Hulton, Worsley, Manchester. They will also hold an auction of Fish and Equipment. For any further information please ring Farnworth 791312 (Kevin Buckley) or write to 1 Saddon Lane, Stoneclough, Radcliffe, Manchester M26 9EN.
- 8th September:** Huddersfield Tropical Fish Society open show at Slaitheville Civic Hall, Slaitheville. Details from Mrs. P. Town, 167 Abbey Road, Shipley, Nr. Huddersfield. (Tel: Kirksturton 7946).
- 8th September:** Wellingtonborough & District A.S. open show at Westfield School for Boys, Brickhill Road, Wellingtonborough, Northants. For schedules write to M. Coe, 20 Salisbury Street, Kettering, Northants (Tel: 521600).
- 10th September:** Weymouth A.S. host to this year's Triple Show which is to be held at the small Sidney Hall, Weymouth, commencing 7 p.m. The other two clubs competing are Dorchester and Yeovil. More details from Club Secretary, Mr. S. G. Harding, 6 Ransleigh Road, Weymouth, Dorset DT4 5JD.
- 12th September:** Hounslow & District A.S. open show at the Hounslow Youth Centre, Cecil Road, Hounslow. Information from Show Secretary, T. Bellingrook, 2 Holmwood Close, Addlestone, Surrey (Tel: Weybridge 54975).
- 12th September:** Bristol A.S. coldwater fish show at St. Ambrose Church Hall, Strifford Road, Whitshill, Bristol, 3-5.30 p.m. Details from I. Midson, 87 St. John's Lane, Bristol BS3 5AB (Tel: 0272 712383).
- 13th September:** British Koi Keepers Society national open show (Koi 81) at Birmingham Gardens, Diss, Norfolk. Membership Sec., Mrs. C. Mullins, "Woodlands", South Avenue, Langdon Hills, Basildon, Essex.
- 13th September:** Buxton & District A.S. open show at the Paxton Soles, Pavilion Gardens, Buxton.
- 13th September:** Barnsley Tropical Fish Society 17th open show at the Hall Bank School, Huddersfield Road, Barnsley. Further information contact G. Wall, Barnsley 47210.
- 13th September:** Cheltenham Tropical Fish Club open show at St Marks Community Centre, Hesters Way, Cheltenham, Glos. Schedules (June onwards) from M. Jenkins, 3 Marlborough Place, Princess Street, Cheltenham, Glos. S.A.E. please.
- 13th September:** Potteries and District A.S. 2nd annual open show. Venue: Stoke-on-Trent Technical College, Moorland Road, Burnham, Stoke-on-Trent, Staffs. Further details available from Melvyn Clarke, show secretary, 91 Chell Heath Road, Bradley, Stoke-on-Trent, Staffs.
- 15th September:** South Park Aquatic (Study) Society talk on Ponds and Native Table Shows, at Wimbledon Community Centre, St. George's Road, Wimbledon, S.W.19, at 8 p.m. New members and visitors always welcome. Full details from Mrs. M. Dudley. Tel: 01-540 5962.
- 17th September:** Kington and District A.S. Bring and Buy at Raynes Park Methodist Church Hall, Worpole Road, Raynes Park, S.W.20. Further details from Pat Lambert (Tel: 01-542 5956).
- 20th September:** Berwick & District A.S. open show at the Twerdmouth Middle School. Judging 1.45 p.m., benching from 11.30 a.m. to 1.30 p.m. Further information from Mr. S. Murray, 78 Dean Drive, Berwick-on-Tweed, TD15 2DE or by phoning Berwick 5591 after 5.30 p.m.
- 20th September:** North Wilt A.S. open show. Details from Show Secretary P. Taylor, 7 Ridgeway Road, Stratton, Swindon. (Tel: 824114).
- 20th September:** Tonbridge & District A.S. open show at Hedlow Community Centre, Hedlow. Schedules from A. Peat, 5 Pollards Wood Road, Nr. Otford, Surrey RH8 6JN.
- 20th September:** Diss open show at the Youth Centre, Shillinger Road, Diss, Norfolk. Schedules from Neil Huzzo, 18 Blimesfield Road, Diss, Norfolk IP22 3NU. (Tel: Diss (0379) 4541).
- 20th September:** Chatterfield A.S. open show at Westfield upper School, Morthorpe. Benching 12-1.45 p.m., Judging 2 p.m. Schedules from L. Walker, 79 West Street, Eickington, Nr. Sheffield S31 9GA. (Tel: Eickington 432531).
- 20th September:** Dalkeith Community Centre A.S. open show at Dalkeith Community Centre, Woodburn.
- 27th September:** First open show of the Northern Area Group of the Catfish Association of G.B. For details write to Mr. J. T. Morris, 102 Cole Lane, New Springs, Wigan, Lancs., or Mr. B. Baldwin, 10 Clive Grove, Southport.
- 27th September:** Throckley A.S. are to hold a grand auction and limited class show in the George Welfare Association, Throckley. All proceeds to go to the George Welfare Ambulance Appeal Fund in "The Year of the Disabled." Benching 11.30 a.m. to 1.30 p.m. Auction in main Hall at 1.45 pm. Please bring as many fish and as much equipment as possible for auction in support of this appeal. Schedules available later (s.a.e. please) from Mrs. D. Lakey, 51 Hewley Crescent, Throckley, Newcastle-on-Tyne (Tel: 0632-677236).
- 27th September:** Wolverhampton A.S. open show at the Oxley Community Centre, Marsh Lane, Wolverhampton. Details from Show Secretary, Peter Winmill, 16 Evington Way, Wolverhampton (Tel: Wolverhampton 55979).
- 27th September:** Harlow A.S. open show at Moot Hall, The Stow, Harlow, Essex. Show Secretary, Peter Murdoch, 11 Woodfield Terrace, Thornwood Common, Epping, Essex, (Tel: Epping 72214).
- 27th September:** Wyke show Society, Hull, open show.

OCTOBER

- 2nd October:** Goldfish Society of Great Britain open show and convention. Particulars from J. Berger, 14 Brown Gardens, Barking, Essex.
- 2nd October:** The British Koi-Keepers Society—11th Anniversary celebration at the Leicester Centre Hotel from 12.30 p.m. onwards. Lectures will be given by Dr. David Ford (Feeding, etc.), Mr. Austin Cartwright (Diseases), and Mr. Roland Seal (Film on Koi). Dinner-dance in the evening. Contact R. Talbot (Tel: Garboldisham 368.). Membership Sec. Mrs. C. Mullins, "Woodlands", South Avenue, Langdon Hills, Basildon, Essex.
- 4th October:** Newbury and District A.S. open show at the Corn Exchange, Market Place, Newbury, Berks. For more information contact the Show Manager, Robin Ganning, 6 Southend, Cold Ash, Newbury, Berks. (Tel: Thatcham 64254).
- 4th October:** A & D Fishkeepers first open show at the Sutton in Ashfield Social Service Centre, Hillocks School, Sutton.
- 11th October:** British Cichlid Association convention at the Meeting Rooms, Zoological Society of London, Regents Park, 2.0 p.m.
- 11th October:** Darwen A.S. open show in the Library Theatre Darwen. Details from Secretary Derek Goss, 95 Greenway Street, Darwen.
- 11th October:** South Leeds A.S. open show at Hamlet Boys Club, Hillside Road, Leeds 10. Benching 12-2 p.m. Schedules from R. Day, 3 Beulah Mount Woodhouse, Leeds LS6 2JZ.
- 11th October:** East London Aquarists and Pondkeepers Association annual open breeders show at the Catterick Hall, Cecil Road, Chadwell Heath, Romford, Essex. Schedules from Mr. Keith Palmer, 14 Palfwell Avenue, Barking-side, Essex.
- 15th October:** Doncaster & District A.S. open show at Don Valley High School, Jossey Lane, Stawthorpe, Nr. Doncaster.
- 15th October:** Wye Forest A.S. open show. Show secretary Charles N. Baskerville.
- 15th October:** Bethnal Green & Independent A.S. first open show at Windsor Road School, Windsor Terrace, East Ham, London, E.6. Further details and schedules from Mr. J. A. Brown, 46 Airthra Road, Goodmayes, Ilford, Essex IG3 9QU (Tel: 01-599 8232).

NOVEMBER

- 1st November:** Halifax A.S. open show. Benching 12-2 p.m. Schedules (s.a.e. please) from David Skidde, Cobblestones, Gannet, King Cross, Halifax.
- 7th & 8th November:** British Aquarists Festival at Belle Vue, Manchester. Details and schedules from John Hall, 54a Carr Road, Colverley, Pudsey LS28 5RU.
- 8th November:** Bradford & District A.S. open show at Temple Hall, Westgate, Bradford. Details and schedules can be obtained from the show secretary, Mr. A. D. Fisher, 2 Sherbourne Road, Idle, Bradford (Tel: Bradford 44466).
- 15th November:** Essex & East of London A.S. 1st Convention. Speakers: Ian Sellick (Cichlids); Mike Sandford (Pond Life); Joe Linale (Coldwater); and a speaker from the Characin Society. To be held at St. Augustine's Church Hall, Byebuck Road, Rush Green, Romford. Tickets: £1.00 (s.a.e. please), available from Dave Henman, 1 Windmill Meadows, Ayrthorpe Road, Danmore, Essex.
- 21st November:** Goldfish Society of Great Britain general meeting, 2 p.m., Conway Hall, Red Lion Square, Holborn, London.

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