

MAY 1981 60p

AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



Illustrated Colour Features

Spawning the South American Leaf Fish

Spotlight on The Veiltail Goldfish



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). May-December 1981
£6.70. 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. 2, 1981

Editor: Laurence E. Perkins

Advertisement Manager:
J. E. Young

Our Cover:
Hyphessobrycon socoloffi
Photo by
A. van den Nieuwenhuizen

CONTENTS

| | |
|----------------------------------|----|
| <i>Copeina guttata</i> | 24 |
| <i>Acanthopthalmus myersi</i> | 28 |
| Spotlight—The Veil-tail Goldfish | 30 |
| From a Naturalist's Notebook | 34 |
| The Ruby Shark | 38 |
| Spawning the leaf fish | 40 |
| Beginning with Tropicals—No. 10 | 42 |
| Press Release | 43 |
| Meet the Aquarist—No. 9 & 10 | 46 |
| Coldwater Jottings | 49 |
| What is Your Opinion? | 50 |
| Product Review | 56 |
| Coldwater Queries | 58 |
| Tropical Queries | 60 |
| Plant Queries | 61 |
| Marine Queries | 62 |
| Commentary | 63 |
| Book Review | 64 |
| Crossword Puzzle | 65 |
| News from Societies | 66 |

The Editor accepts no responsibility for views expressed
by contributors.

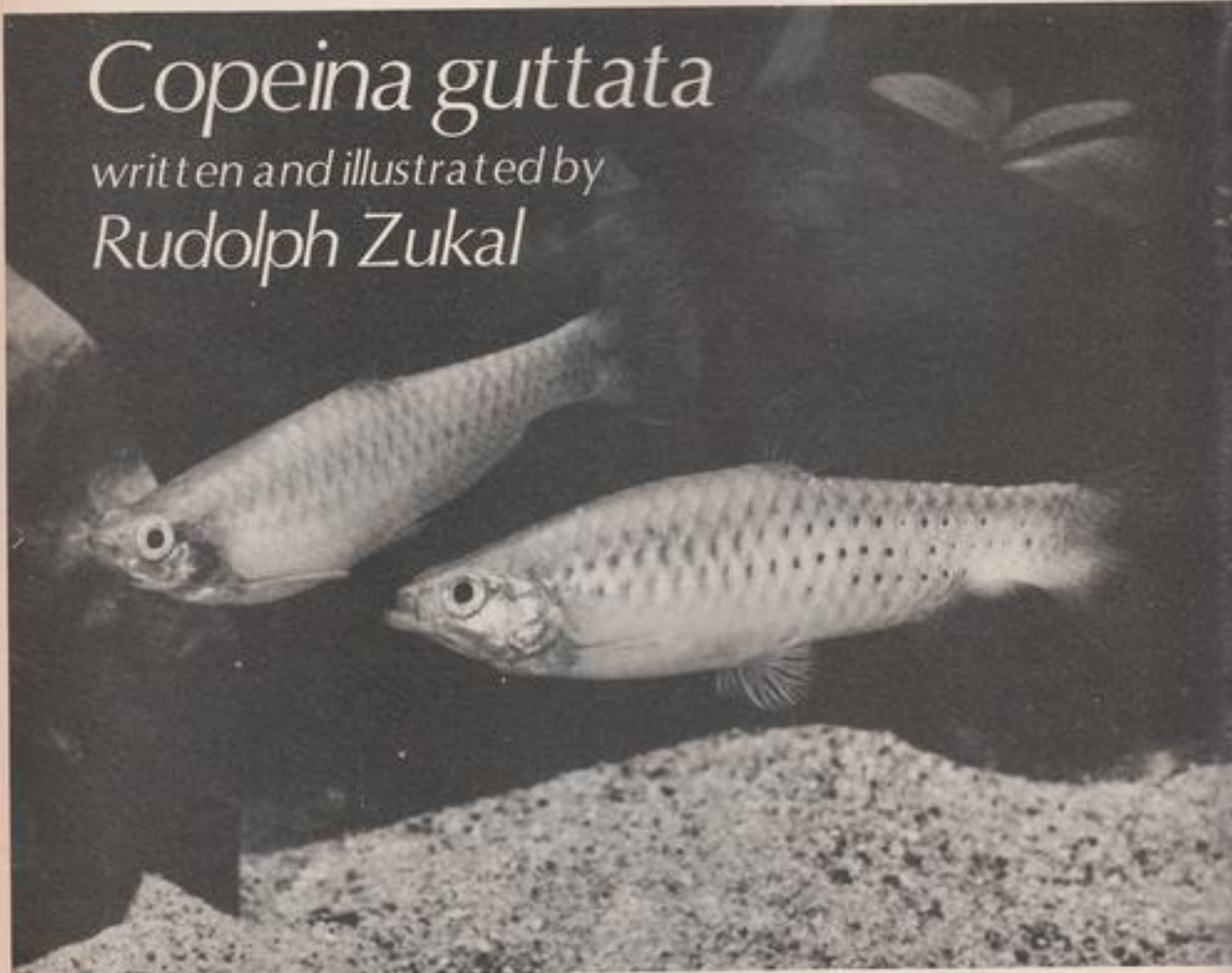
SINCE AS EARLY as 1912 this characin has been an attractive, but unfortunately, very rare inhabitant of the aquarium. Its body resembles that of a trout, is relatively sturdy and measures up to 8 cm. Although some books give larger measurements, I personally have not seen such large specimens. The scales are quite big and each one bears a red spot. The back is a greenish brown, the flanks a light blue colour and the underside white. The iris is red. The dorsal fin has a black bead-like mark which is more marked in the female. Apart from this the fin is a transparent yellowish white.

Sexual differentiation is straightforward in adult fish, made particularly easy by the mark on the dorsal fin, which is hardly visible in the male. The vertical fins of the male have a reddish colour whereas those of the female are colourless. The male is a little larger and sturdier.

Male (right) and female fish

Copeina guttata

written and illustrated by
Rudolph Zukal



Breeding and rearing is similar to procedures for *Pyrrhulina*. *C. guttata* is a peaceable species, unfortunately rather shy and, as the fish is a good jumper, the tank must be carefully covered. It can be kept with any other characins, including smaller ones. It is omnivorous and will readily accept foodstuff of a vegetable nature when offered as a change. I keep them in a 100 litre tank together with all the breeding pairs I have set aside from other tanks. Previously, I kept them in another largish tank which was rather heavily planted and because of their shyness I hardly ever saw them. In the present tank the

The pair swims in circles and at the same time dig the spawning pit



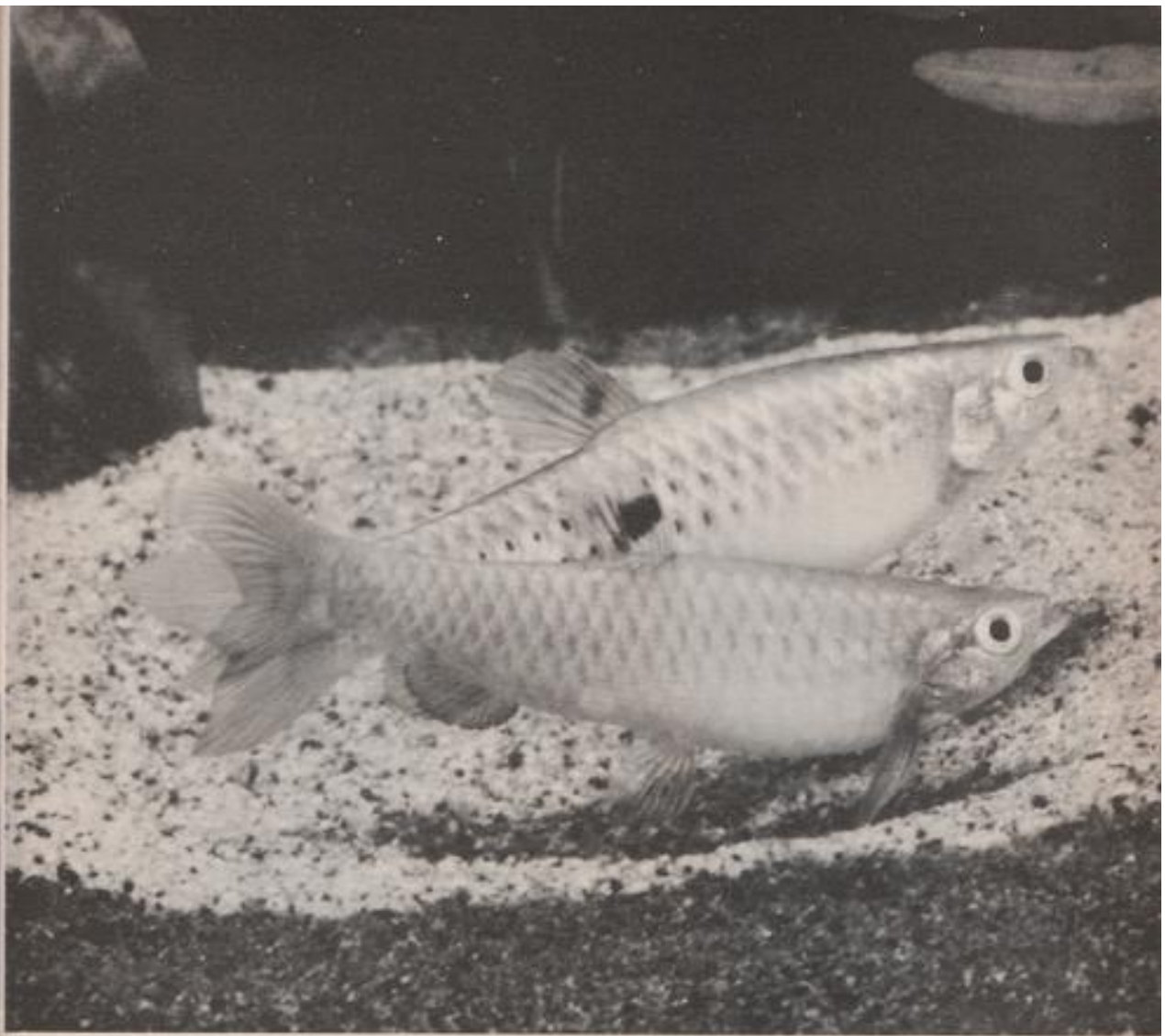
plants are relatively sparse because of the frequent netting and removal of the other fish. The fish lost some of their shyness, but they always rushed to the rear tank wall whenever I approached the tank. The temperature was 22°C and normal tap water used. Here in Brno the water is 10-14 dH in most cases, with a pH reading varying between 6, 8 and 7, 2.

Before going on to describe the spawning action, I would like to mention the following consideration. I have been aware for some time that changes in the weather, or to be more exact, changes in atmospheric pressure, have a great influence on the behaviour of fish. With rising pressure (fine weather) most species will spawn readily. Even in a community tank a greater degree of activity is

The pair sink to the substrate and into the spawning pit

apparent on the part of all the inhabitants. I have confirmed this fact by means of a great number of experiments. One more thing. If the fish are just about to spawn or in the process of spawning, it is not so easy to frighten and disturb them. A spawning pair can often be transferred to another tank and after a short pause the fish carry on spawning. One morning after feeding the fish I noticed that the male, his anal fin coloured bright red, was describing circles around the female. Everything pointed to the preliminaries which would soon be followed by actual spawning. I had nothing else to hand except a rather small glass tank which hardly held 8 litres. I knew that this was far too small, but I had no alternative if I wanted to capture the event in pictures. Immediately I washed sand, filled the tank with water from the community tank and added two litres of warmed fresh water. The temperature was 27°C. At the back of the tank I introduced a few ordinary plants and in the foreground I planted a largish Echinodorus leaf in the sand. The fish were left to choose. After transferring the pair, virtually nothing happened for a whole hour. It was eight o'clock in the morning. Then I placed a few floating plants on the surface and so cut down the amount of light from above. Almost at once the miracle occurred. The fins of the male, which up until now had remained pale, took on their reddish coloration and courtship was renewed.





The male presses his caudal fin under the female's and spawning commences.

The male swam around the stationary female. Finally both fish became more agitated. The male tried to press himself against the female's side and place his caudal fin under her body. The female tried to escape, but was pursued by the male. Gradually the fish left the upper part of the tank and drew nearer to the bottom. Adopting a curved posture the female awaited further developments.

She was gently rammed in the region of the abdomen by the male and delicately forced back. The fish then put on a further courtship display by making turning movements.

In doing so a depression was hollowed out in the sand. When the pit was relatively large the male placed himself inside and enticed the female by making his whole body tremble. When the excited female finally approached, the two fish pressed against each other in the spawning pit and spawning took place. The spawning action lasted about two hours and up to 500 eggs can be produced depending upon the size of the fish. After spawning the female must be removed, with care of the brood being taken by the male. After 36 hours the brood hatches. At this stage the male can be removed too. After a further three days the young are free-swimming. They are very sensitive to change in temperature and need very fine live food.

Acanthopthalmus myersi—one of the Thorn-eyed Cobitid Loaches

by Vajdák Bohumil

Photos by Rudolph Zukal



The female showing a fuller body, often bearing spawn.

A NUMBER OF years ago I came across an item, while perusing some aquarist literature, about breeding this loach with the aid of hormonal injections. Shortly afterwards one of my aquarist friends very kindly gave me five of these fish. They were about 4 cm in length and as slender as a match-stick. My pleasure in receiving this gift was diminished on the following day when I found two desiccated fish on the floor next to the aquarium. Fortunately, I was soon able to acquire further specimens. The fish were very lively, even though there was never any sign of them until towards evening. On the floor of the tank were a few wooden roots and coconut shells and here they preferred to spend their time. They consumed any kind of live food, visiting more often than not the shell containing *Tubifex*. They grew quickly and after about a year the stouter specimens were slightly distended in the abdominal region. These were females which were carrying eggs.

I read through the available literature in order to find out something of the specific needs of these loaches. The information about breeding with the aid of hormonal injections interested me and so I attempted to obtain further information. Finally, I succeeded in acquiring an injection kit of gonadotrophin, which according to what I had read, had been used with success. In the description were also given a water hardness for breeding of about 12° DH and a pH reading of about 7. Water which corresponds to our normal drinking water from the tap.

I set up two tanks the dimensions of which were 100 × 30 × 40 cm (the latter measurement being the height) and put a female and two males in both of them. Before introducing the fish I injected all six fish with the hormone, my hands trembling as I did so. Both tanks were frameless, all-glass tanks and contained no sand. They merely had a coconut shell and a clump of *Microsorium pteropus*. After the injection the fish sank without any other movement to the tank floor, with their bodies arched. At first I thought they would never recover, but to my

great relief some minutes later they swam in a rather laboured fashion into the *Microsorium*. My concern was not unfounded, unfortunately, for on the following day the two females were dead. They probably died as a result of a vital organ being damaged by the injecting needle. To my surprise I noticed about 500 eggs in one tank which, for the most part, were already white. I immediately sorted the eggs, removing those covered with fungus with a glass rod and taking care of the healthy ones. Although embryos hatched from these, they all died within twenty-four hours. Under the microscope I was able to establish that they had been overcome by large numbers of *infusoria* which resembled the slipper animalcule (*Paramecium caudatum*). I tried my luck again, but spawning did not take place, although I did everything I had done previously. As a result at the end of about three days the gravid female had a large abdomen as though swollen by a balloon and the fish swam with difficulty. Consequently, I decided to press out the eggs and this went off without problems. The number of eggs was very large. I tried to press milt from the males, but the eggs did not develop. Some time later I succeeded in obtaining ten more adult fish from a well-known aquarist, four females and six males. In view of the previous experiments, I decided to try out other possibilities—hormonal baths, different concentrations of the substance, different volumes of liquid injected and changes in the degree of hardness of the water and its pH reading directed towards encouraging the development of the eggs. Sometimes spawning took place without my intervention and as far as results were concerned these occasions were the most successful. Spawning which takes place in this way can on occasions be very inconvenient, for the fish do not spawn 'on command,' as in the case of many species of characins. So I resorted again to the hormonal treatment, even though I knew that this did not guarantee a hundred-per cent success. In the course of the past two years I have undertaken twenty-eight experiments which I recorded and subsequently incorporated into a table. From this information I was able to

establish that the best results were obtained from an indication of 150 milli-units of gonadotrophin for each fish. Spawning usually follows 8-12 hours after the injection.

The male takes the lead during the spawning action, beginning with his courtship of the female. He takes hold of the female's barbels or the spiny outgrowth at the eye and attempts to raise the female upwards and swim with her to the surface. He does not succeed at once, but finally both fish swim upwards together. At a later stage in spawning this act of swimming together begins just below the surface of the water. The speed at which the fish swim is 10-15 cm a second. This joint movement often ends without spawning taking place, as if the fish are startled by something. They move away from each other and swim singly to the floor of the tank. After a time, however, they start swimming side by side again, just below the surface, with the male leading the female by the barbels. They swim more and more quickly until the female is suddenly embraced by the male, the eggs are extruded from the female and immediately fertilised by the male. The eggs are extruded with such force that the whole surface of the tank is disturbed and numerous large bubbles of air accompany them. After this spawning action the fish descend to the bottom of the tank where they rest for a time. After a short pause of 5-20 minutes spawning is repeated. The number of eggs produced after a whole spawning sequence is very large—I would estimate 2,000 to 3,000. The majority of them, however, are unfertilised. The healthy eggs must be transferred to pure water which does not contain infusoria, as the water in the breeding tank is already affected by the unfertilised eggs. If the water becomes cloudy as the eggs or the embryos develop then the whole brood is usually lost. As a result the eggs and the fish must be checked every eight hours. The fry hatch at a temperature of 26°C after 24 hours. Newly hatched larvae have exactly the same greenish colour as the eggs, but they turn pale within a few days. The larvae and later the young fish as well have large external gills to help them over the first days of life, but these recede within the jaws within fourteen days and disappear.



When a number of fish are ready to spawn, there is a commotion. Each male seeks a partner and tries to take hold of her by the barbels.



The fish swim backwards and forwards in unison below the surface.

The young fish accept their first food 72 hours after they have been spawned. First of all I use cyclops at the nauplii stage. As the fish tend to keep themselves near the tank floor, it is a good idea to kill the naupliac by immersing them in hot water. This also prevents the brood from being bitten. Two hours after introducing the food, remains of it could be seen in the intestines of the young fish when viewed under the microscope. At an age of 120 hours the fish accept grindal worms and small, dead cyclops. The external gills very gradually grow smaller. Eight days after the first feed the young fish have three small pairs of barbels and on the back behind the head the beginnings of the coloration characteristic of the species. After fourteen days of life the external gills have disappeared. The fish are already 14-16 mm long and seek actively for food.

In conclusion, a few additional points. It is necessary to cover adequately the tank containing these fish. Fish very often jump out of the water, especially in the corners of the tank. Given the slightest opportunity the fish will escape from the tank. The fish are most likely to jump out of the water during the first night after they have been moved into a new tank. They cannot put up with any trace of copper or impurity in the water.



Finally, the female is held in a firm embrace and the fish spawn, eggs floating to the surface.

SPOTLIGHT

The Veil-tail Goldfish

by Rudolph Zukal

Carassius auratus gibelio.





OVER MANY centuries many types and colour variations of the Asiatic Gibel carp shown in the photograph (*Carassius auratus gibelio*) were bred in ancient China. The goldfish was brought to Portugal as early as the 17th century and from there it spread throughout the whole of Europe. All the different kinds of veil-tails originate from cross-breeding or selected breeding of goldfish, the fish seen so often in garden ponds.

The goldfish and its primitive form, the Gibel carp, are similar in their way of life and characteristics to native carp. Food is found by grubbing at the bottom of the water or it is taken from the surface. The fish are omnivorous.

In America, in Martinsville, they are produced, literally speaking, by the million. Here there is a large fish farm, perhaps better described as a fish factory, the extent of which it is difficult to visualize. 15 kg of wheat flour are fed there daily. More than 20 tons of egg yolk are imported annually from China. The farm has more than 350 tanks, each one 20 m by 6 m. The fish are transported by means of lorries bearing tanks, which carry 200,000 fish in 50 hectolitres of water. Large quantities of these goldfish are bought by municipal author-

ities in order to stock waters in public parks and so destroy gnat larvae.

Goldfish were bred in China as early as the 10th century. With the aid of countless experiments the Chinese bred the familiar veil-tails in many shapes, colours and variations. The renowned golden coloration resulted from mutation and is usually highly constant.

Veil-tails need a largish aquarium which has a bottom of coarse sand. No sharp-edged stones should be placed in the tank, as the fish can easily injure themselves when frequently swimming carelessly around the aquarium. Aeration and a good filtration system are necessary. Only strong, sturdy plants should be installed. A proportion of the water should be changed weekly.

Veil-tails are peaceable, not difficult to keep, and appreciate a varied diet. The most suitable temperature range for breeding is 15-22°C. They do not tolerate very well a large drop in temperature, even though this is not immediately noticeable. The fish suffer a chill of the swim bladder, they keep themselves constantly in one place at the bottom of the tank, their bodies list, but they do continue to accept food.

The goldfish from which the veil-tail was developed.

Veil-tails spawn several times in the year. Unfortunately, the fish decide for themselves when the most favourable times are. One can, however, help to speed up the process. As soon as the fish are observed chasing each other through the community tank, the female and the most agile male are transferred to a 100 litre tank. This contains coarse sand and needs no more vegetation than small clumps of delicate plants. Nitella, Java moss and so on are the most suitable. It is not always easy to differentiate between the sexes but is best achieved by observing the behaviour of the fish. The male often has spawning tubercles on its forehead.

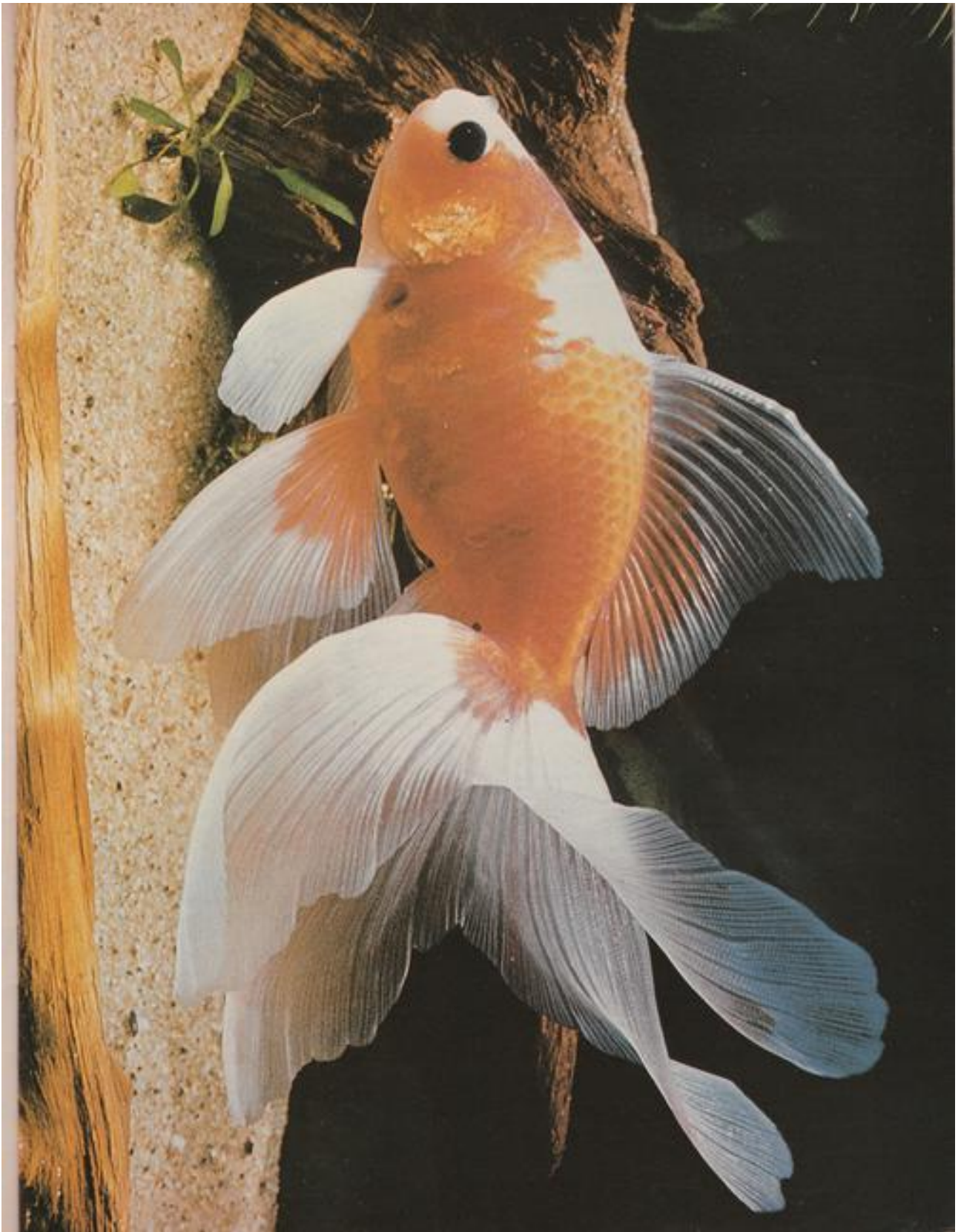
Spawning is facilitated if the fish are put in water which is clean, has been allowed to stand for a short time, is well aerated, and about 2°C warmer than in the tank where they are kept. When the fish spawn, the process lasts about three hours. Immediately afterwards the fish must be removed as they readily eat the eggs. 1,000-3,000 eggs are laid. On the second day a large number of white, unfertilised eggs are seen, which are removed by means of a glass tube in order to prevent the healthy eggs from being contaminated by the decomposing ones. The brood hatches after about four days. After a further three days

the fry are free-swimming and accept fine food. They are fed several times a day. The fish grow at varying rates, so they must be sorted according to size after 4-6 weeks. Healthy specimens with correct fin growth are not sorted out until six months have elapsed. A large number of young fish retain the body shape of the original type, *Carassius auratus*. Attractive, two-year-old specimens only are selected for breeding. As veil-tails need vegetable foodstuff, this aspect of their diet should not be neglected but fed to the fish along with live and dried foods.

SPOTLIGHT

Veil-tail pair during aquarium spawning chase.





ONE OF THE most interesting grants from the National Environmental Research Council is £12,000 for a 3 year study by Dr. Phil Smith of Liverpool Polytechnic on the population dynamics of the most important British colonies of nocturnal natterjack toads on the Merseyside (old west Lancashire) dunes, from Blundell sands to Southport-Hesketh golf-course. This lasts to autumn 1983 and will determine their numbers, trends and major mortality-factors for conservation. There will be a census of adults, spawn, tadpoles and toadlet-production, the main environmental changes, like rain and drought, and the age-structure of the population.

Natterjack toads

Dr. Smith sent me a reprint of his recent report on the local survey made with the warden of Ainsdale National Nature-Reserve where, out of 132 sites containing water on the dunes, natterjacks assembled in spring at 101, 2,001 strings of spawn were counted at 95 sites, 95% of this in a short peak period before 11th May. Most of the spawning was in mild, rainy periods from mid-April to early July in shallow water rather than deep ponds and ditches, mostly in the scrapes or pools excavated in recent years for them. But several failures were due to these shallow scrapes drying-out in dry spells, a risk to which the natterjack populations are adapted in their periodic rise and fall in numbers. A theory that females spawn more than once in a year was not proven, though adults move between different waters during the breeding season.

It has always been one's experience that males dominate the sex-ratio from 6 to 10 males to 1 female in a population now reaching 2 or 3,000, which is less than a 1970 estimate of 10,000 which I thought was too large. Hybridising with the common toad has occurred ever since my youthful introduction to these colonies over 60 years ago as I have mentioned in the past, but never with fertile hybrids.

Other government research grants include £23,573 for a 3 year study by a University of Wales biologist on the distribution of midge-pupae in relation to slope of the river-bed, temperature and water chemistry in the River Wye, and £21,985 for a Bristol University biologist's study by net and pump of the downstream drift of midge-larvae in the River Chew. A Newcastle University zoologist finishes this September a £17,602, five year study of copper and lead tolerance by the water hog-louse *meridiano*, and its genetic influence. A London University botanist is on a £41,317, three year experimental controlling of the development of blue-green algae in the plankton by underwater-illumination. Another Liverpool Polytechnic biologist is in a £13,211, two year study of the diatom-flora of the famous eutrophic or "algal bloom" meres at Rostherne in Cheshire and Ellesmere in Shropshire, by taking sediment-cores from the bottom and counting the annual numbers of diatoms deposited per square centimetre during the development of these meres, dating by radiocarbon, etc. A £19,833 study of algal blooms was completed recently by London



From

a

Naturalist's Notebook

by Eric Hardy

University, while £68,000 studies are being made of green algae.

Pike

A Leicester University zoologist finished in September a £15,755, three year investigation of the learning and feeding strategy and time of pike, the senses it uses to find information about different prey and their size, and training pike to observe their vision, smell and lateral line uses. £22,681 goes to a study of the effect of moth-proofing PCSD fed to pike! A £19,343 three year study of the environment, glandular-secretion, light, temperature, etc., on the onset of reproduction and spawning by rainbow-trout by an Aston University biologist also ends then. Prof. W. T. W. Potts at Lancaster University is in a 3 year, £19,318 investigation of the physiology of various stocks of trout, to find which would be most useful for restocking increasingly acid waters in Norway, U.S.A. and Canada as well as Britain, which have become depleted, or lost all their trout.

£49,387 goes to a Bangor University zoologist's study of how fish-schools evade predators, including the use of vision and the lateral line. Reproduction of sea-urchins at the Scottish Marine Biological Station in the Rockall Trough is the subject of a £20,420 study by a

Swansea University College oceanographer. The rock-dwelling animals of the southern Northumberland coast have been the subject of a £13,352 survey the past 3 years, and the brown seaweeds around the British Isles have been the subject of a £23,420 survey from Portsmouth Polytechnic for the 3rd volume of Prof. E. G. B. Jones' "Seaweeds of the British Isles." £18,410 went to a study of the influence of worms in the muddy Firth of Forth and £5,723 to tagging declining bass off Essex and Pembroke to check their seasonal migrations for future conservation. £22,600 goes to a study of the common green crab's defence against bacteria by monitoring radioactively-labelled bacteria. These are only a few from the Council's £3,094m research-grants last year.

Lobsters

Over-fishing has caused an alarming decline in lobsters in Norway, Denmark, Sweden and parts of western Britain, necessitating conservation measures such as preserving juvenile stock by increasing the minimum catching size here to 83 mm. carapace-length. The banning of landing egg-bearing or "berried" female lobsters is difficult to enforce, for in the past eggs were scrubbed off. France has released berried hen lobsters in 15 sanctuaries established for them on its Atlantic and Channel coasts. About 15,000 post-larval juveniles have been added since 1977 to 3 sanctuaries off Brittany.

The great increase in river and canal angling in recent years is one of the disturbances listed by the Nature Conservancy's recent *Otter Survey* for a dramatic drop in most of Britain's otter-population, despite the removal of dangerous pesticides from sheep-dips and the establishment of otter havens or breeding "holts" like Rusland Pool in south Lakeland. Only 6% of former sites were found to be occupied in England, mostly in the West Country but none in the Thames area, 20% in Wales and 73% in Scotland, mostly the western Isles, Hebrides and Orkney. The now well-established mink is not considered a competitor, though many now inhabit former otter-waters in Lakeland and the Welsh border. (*Otter Survey of England 1977-79*, Nature Conservancy Council, £1.85; *Otter Survey of Scotland 1977-79*, Vincent Wildlife Trust, £2; *Otter Survey of Wales 1977-78*, Society for Promotion of Nature Conservation, £1.50).

Sea Bass

Who is to blame for the great decline in bass, once one of the commonest summer fish around our coasts—increased commercial gill-netting or increasing boatloads of sport anglers? I mentioned a few years ago the decline caused by boat-angling upon slow-breeding skate. Bass take 5 years to mature, when they are 15 inches and start breeding. Catches of 7,000 lb around Eddystone Rock raised such concern that conservationists on both sides met in February in London and worked out a common policy. This included bass-sanctuaries where nylon monofilament nets would be banned, and a limit on further netting by issuing licences. One statement which ought to be dismissed at the start was the claim of old Plymouth

fishermen that we have 2 or more species of sea-bass: smaller *lupus* in freshwater estuaries growing only 12-18 ins., and larger marine *labrax* attaining 15 lb.

Only one species of sea-bass is recognised in British waters, *Morone labrax*. Younger fish tolerating freshwater in estuaries were confused for another kind. When 2 years old and 6 inches, they descend to brackish water and at 3 years and 9 inches move to the estuary mouth. The commoner female fish grow faster than males, reaching 14½ ins. in 4½ years unless too abundant, when competition for food keeps them an inch or so smaller. Females spawn at 5 to 6 years, when they weight 1½ to 1 lb., and males a year earlier. It was proposed to make this the minimum size-limit.

The Nature Conservancy is also concerned at the time of writing over inadequate safeguarding by the Government's Wildlife and Countryside Bill of sites of special scientific interest like the Dorset heathland at Horton Common, a 200 acre haunt of sand-lizard and smooth snake recently bulldozed down to grass. Its present conversion to poor grazing for ponies can alter the habitat to the demise of these scarce Britons.

R.S.P.C.A.

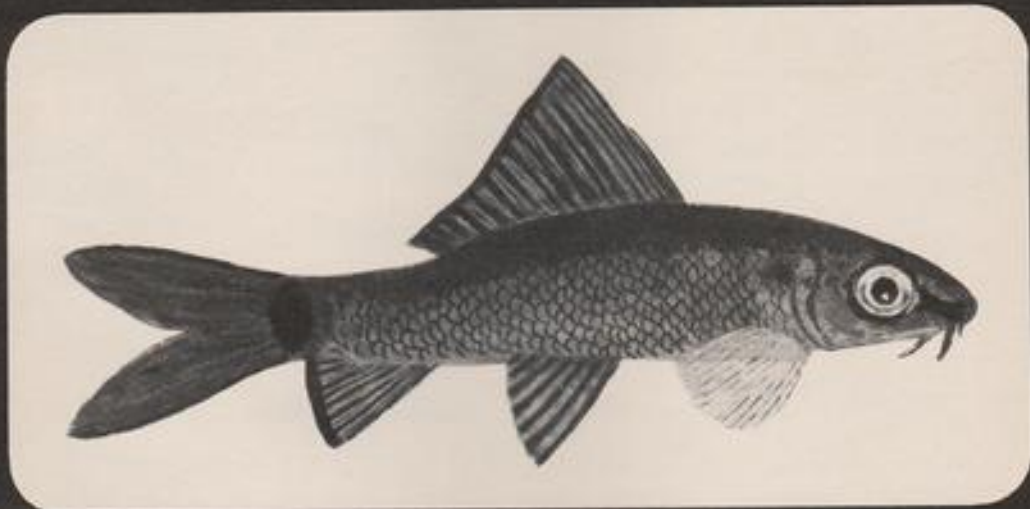
Bradford magistrates dismissed recently another curious R.S.P.C.A. prosecution of a pet-shop owner for cruelty to a mouse put into a python's tank for food. Costs were awarded against the society. On this policy, should the society consider equally cruel the legally-permitted release of live hares before 2 greyhounds for coursing?

As a member of the National Audubon Society of U.S.A., I received a new colourful wall-map of the U.S. depicting all its wildlife-reserves, etc., plus a list of 230 endangered and threatened species. This includes 45 fish, from Alabama cavefish to Pahrump killifish, 6 trout, 5 pupfish, 3 Gambusia, 8 darters, 4 chub and the short-nosed sturgeon. Nineteen reptiles include 6 turtles, 6 snakes and 4 lizards while the 7 amphibians include 4 salamanders, Pine Barrens tree-frog and Houston toad.

Recently reviewing Professor Anthony Netboy's new book on *The Columbia River Salmon and Steelhead Trout* (University of Washington Press, £8.40), I was a little startled to find him admitting that although he has been publishing books on salmon since 1958, he had not seen a salmon dead or alive until 1952. He tells the sad story of dams and hydroelectric works almost exterminating the once abundant salmon and the world's greatest haunt of steelhead trout after commercial over-fishing decimated the stocks. Removing the book's tables, the index, the chapter-notes and the incomplete 7-page bibliography which largely duplicate, chapter-ends, etc, one is left with 117 pages of reading text plus 8 pages of monochrome plates, showing the high price of U.S. books. Like several other historians of North American salmon, he states that the Japanese species *Oncorhynchus masu* "does not occur in North America," but as I have mentioned before, it has been taken in August 1960 in Alaska (U.S. Commercial Fisheries Review, January 1961, p.17) which qualifies it for the American list.

The Ruby Shark

by Jack Hems



Labeo erythrurus is known as the ruby shark over here and the rainbow shark in America. It is a member of the family Cyprinidae and is native to the fresh waters of Thailand and surrounding areas. Its most characteristic features include small scales, an underslung mouth, two pairs of barbels and the ability to thrive in almost every type of water that is neither unreasonably acid nor unreasonably alkaline. The general coloration of this fish is variable, as is to be expected in a species found over a wide geographic range. In short, it may wear an apparel of bronzy green to olivaceous brown or blue-black to charcoal-grey. The two latter forms (sub-species or geographical races perhaps?) are the ones that add such distinction to a tank; for in addition to the dark body colour the sides are overlaid with a pale lavender-blue sheen. This lavender-blue sheen is most apparent when the fish emerges from one of the darker parts of the tank and swims into full light.

It is interesting to observe that when it turns head-on against the front glass, spreads its paired fins, and ascends to the upper levels of the water as it rasps away at vegetable growths, the throat and anterior underparts display a muted golden and silvery white surface.

The body is most gracefully elongated, tapering from the slightly arched dorsal ridge, forwards to a rounder snout, and backwards to a moderately compressed tail adorned with a black spot. A dark brown or blackish stripe extends forwards from the large gold-rimmed eye towards the limits of the transverse mouth. The ventral profile runs in an almost straight line from the throat to the anterior base of the anal fin. The lips are fleshy and extensible: ideally suited to lapping or sucking or rasping food from plants or stones or waterlogged wood or bottom ooze.

Indubitably what makes the fish so wonderfully beautiful is the colour of the fins. The tall dorsal, long in the base, anal, caudal and pelvics are scarlet: rich scarlet, like blood. To accentuate this rich blood-like hue the margins of the anal fin, and its well-defined rays, and the rays of the pelvics, are coloured black. The pectoral fins are not nearly so colourful in tone.

Ordinarily *L. erythrusus* attains a length of about four and a half to five inches. It does not grow very rapidly except during the first nine to twelve months of its life. Thenceforward its progress is sometimes markedly slow. For the rest, the species is long-lived and in the main has a life-expectancy beyond six or seven years. In addition to its long life (under favourable conditions, of course) tolerance to a gradual rise or fall of a few degrees (°F) in temperature is a great point in its favour. Generally speaking a temperature of about 75°F (24°C) suits it well.

L. erythrusus is extremely accomodating in the matter of food. By natural inclination it is an indefatigable seeker of anything edible waiting to be ploughed up from the grit- or mulm-carpeted floor of the aquarium. Also, no-one can fail to notice that its preferred feeding times are normally spread over the latter part of the day and into the hours of darkness. It will, however, once settled down, glide out of a thicket of plants or one of its lying-up places behind rocks, at any hour of the day to suck in what it can of the food provided for other occupants of a shared tank. It has

a voracious appetite for white worms, live *Daphnia*, small or chopped earthworms, minute slivers of uncooked white fish or lean red meat, together with a liking for regular dried foods, crumbled wholemeal bread, and mossy algae or a cooked vegetable substitute.

Now for a word or two of advice to the intending purchaser of this beautiful fish. Firstly, it resents the company of its own kind or genus. Like the immortal Garbo, it prefers to be alone. Hence if two immature or medium-sized ruby sharks are given their freedom in a tank on their own, or introduced into a tank already stocked with other fishes, one of the two will lose no time in making life a misery for the other every time they meet. In a matter of weeks or months the weaker (in will or general physique) of the two will soon show signs of maltreatment and the result of starvation (it stands a poor chance of obtaining enough to eat) and the end will come suddenly: lack of nourishment combined with too much knocking about or both.

All the same, a single largish specimen of *L. erythrusus* will cause no trouble in a community tank given over to a population of medium-sized to larger fishes too interested in their own affairs to worry about a fish that is too wrapped up in itself to worry about their problems. *L. erythrusus* will rush at other fishes that approach too close to one of its favourite resting places, but the rush is abortive, and after a few moments of body waggling and fin-twitching, *L. erythrusus* will return to its vacated haven of peace.

Young (small) ruby sharks are shy. That is to begin with. Therefore an immature specimen should not be placed in a tank housing fishes that may not be belligerent but possess insatiable curiosity about a new addition to a tank and pester it with attention. To protect it from overtly curious fishes (until the novelty of the stranger in their midst has worn thin) plenty of plants to serve as hiding places are necessary. Within the shelter of the plants the ruby shark will take stock of its surroundings and its diverse companions.

Another thing, when it comes to choosing a young ruby shark in a dealer's shop, look for one showing plenty of colour in body and fins. Look for good body shape—flat but not concave below—a generous amount of red colour in the fins and, when it is observed swimming to and fro in a horizontal line, pass over any fish that swims in jerky or laboured movements.

There is another red-finned shark known as *L. frenatus* on the market which resembles *L. erythrusus* in almost every particular excepting size and richness of colour. *L. frenatus* at full size rarely touches three and three quarter inches. Again, it is more rotund around the middle and its fins hardly ever, if ever, display the eye-catching splendour of its congener. Interestingly, *L. frenatus* hails from Thailand too.

One more word. Do not risk introducing a small ruby shark into the company of fishes much larger than itself. Even the most amiable of fishes—if on the large side—scare a much smaller newcomer away from food and open water: and nervousness is a great handicap to normal growth.

A photograph of two leaf fish (Monocirrhus polyacanthus) resting on a large, brown, textured leaf. The fish are flat and have a mottled, brownish pattern on their bodies, which helps them camouflage as leaves. The background is dark and out of focus, showing other green leaves. The title and author information are overlaid on the bottom right of the image.

Spawning the leaf fish

Monocirrhus polyacanthus

by D. D. Sands

The male (upper) awaiting the female leaf fish depositing eggs on the underside of the leaf.

LAST YEAR I acquired several, rather fine, specimens of the South American leaf fish for retail in my shop. After selling all but two which remained unsold for some time, a customer calmly announced that our 'leaf things' were spawning.

After a quick glance to confirm he wasn't hallucinating, I dashed for my camera and coerced the same 'eagle eye' to hold the flash and aid me in photographing the event.

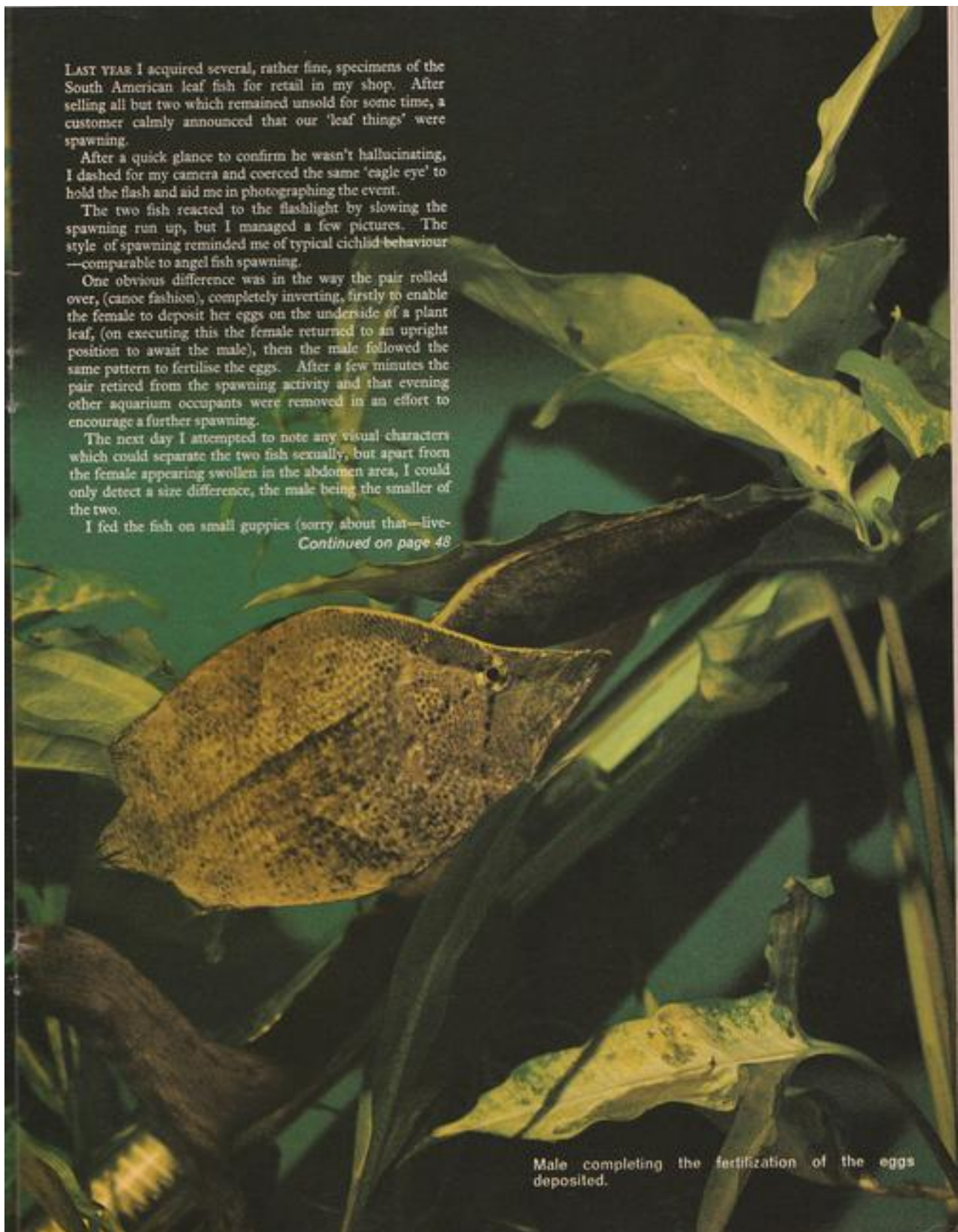
The two fish reacted to the flashlight by slowing the spawning run up, but I managed a few pictures. The style of spawning reminded me of typical cichlid behaviour—comparable to angel fish spawning.

One obvious difference was in the way the pair rolled over, (canoe fashion), completely inverting, firstly to enable the female to deposit her eggs on the underside of a plant leaf, (on executing this the female returned to an upright position to await the male), then the male followed the same pattern to fertilise the eggs. After a few minutes the pair retired from the spawning activity and that evening other aquarium occupants were removed in an effort to encourage a further spawning.

The next day I attempted to note any visual characters which could separate the two fish sexually, but apart from the female appearing swollen in the abdomen area, I could only detect a size difference, the male being the smaller of the two.

I fed the fish on small guppies (sorry about that—live-

Continued on page 48



Male completing the fertilization of the eggs deposited.

Beginning with Tropicals (10)

by Roy Pinks

CONTINUING WITH MY personal selection of beginners' tropicals for a mixed collection, I kept my eye firmly on decorativeness, including here and there a species which justified itself on body shape alone, provided that it was interesting enough by way of temperament to earn its place.

A highly conventional species, as it happened, was the next to be added, and this was the Serpac Tetra. Seldom topping the 2 in. mark it is perhaps the best of the pink and red related *Hyphessobrycon*s in terms of solid colour—the Rosy Tetra and the Bleeding Heart have great charm but are less impressive, tending towards a glassy pink which does not improve with age. The fish I introduced hardly did what I had intended. I had hoped that they would form a small red and black shoal, but they rather dropped away towards the rear of the tank, and instead of co-operating took nips at one another, each regarding the others with considerable suspicion. This scrappy attitude is a characteristic I had not met with in this species before, and although there have, in the course of the year, been no casualties, these fish have retained an independence of one another which I view as something of a let-down. Yet I have seen these shoaling many times, and it makes me wonder how many fish make a shoal—do they lose any inclination to swim together in smaller numbers?

Splash Tetra

I have always had a liking for the Splash Tetra (*Copeina arnoldi*) because its brownish red colour and streamlined body and finnage are something of a breakaway from run of the mill species. This fish also keeps to about 2 in. in size, so it remains unobtrusive, but not to the point of completely disappearing from view. In fact, a pair can prove to be very lively performers, especially if they decide to carry out their unusual spawning display: this is not a common occurrence, and they may find that the distractions of a mixed collection too much for them. The pair I acquired went along nicely until the female contracted dropsy, from which there is scant hope ever of recovery, and succumbed. The male has grown little but shows itself tolerably well, and deserves to be re-mated when an opportunity presents itself.

A species I nearly always introduce to offset the Cardinals and Neons to some extent is the Glowlight Tetra (*Hyphessobrycon gracilis*). I find that the brilliantly glowing horizontal centre line is a feature of the tank which

can nearly always turn the eye, and its brightness varies little as between young fish and old ones. This is usually a fairly long lived species, too, and as they are relatively cheap one can afford to buy several at a time. This fish usually looks pretty healthy in dealers' tanks, and there are few batches of thin and scraggly offerings characteristic of some other species. As they, like others of my selection, are in no way temperamental as regards food, they rate high on my list of indispensables. Whilst they have not been a howling success in terms of shoaling, the males separate and do mock battle, quite harmless, and all in fine colour, so there is always much by way of movement and interest. As an aside, rather, I have always found this quite the easiest of tropicals to spawn in rain-water, so it is perhaps one of the best of all beginners' fish, taken in the broadest sense.

At the time when I was making this selection there appeared locally a most astonishing quantity of the Dwarf Catfish (*Corydoras hastatus*). This has always been one of my regular failures, despite the fact that I am extremely fond of it. No doubt its association with much larger fish usually brings about its downfall, but as my tank had plenty of hiding and resting places and its denizens were selected for their docility, it seemed reasonable to introduce half a dozen of this charming Cat. It is mainly black and silver and seldom grows above an inch. Hovering and swimming in mid-water, it is far more noticeable than almost any of the other *Corydoras* species, and as, even in half dozen batches, it swims in company, it was just what I needed to give this collection a boost. This little group was an outstanding success for some months, and individual fish were obviously improving all the time. When it seemed that at last I was getting the hang of properly cultivating this little creature, along came that disastrous spell of White Spot, and the ill effects of malachite green, a constituent of nearly all the cures, left a sadly weakened brigade which has now finally disappeared. One should not give up, however, and in small collections this species will, with a reasonable share of good fortune, repay most handsomely its board and keep.

Vacancies

The outbreak of disease mentioned above unfortunately created vacancies which could be filled by alternatives, and I introduced other fish over a period. I make this point because readers may start to do their arithmetic of my

purchases and conclude that I had badly overstocked. This was never the case, as I kept well within the rules.

After a few months of keeping these very small fish in a large tank I took to considering what to introduce so as to give a significant contrast in size. Of course, it had to be really decorative and peaceful, and preferably long lived. Not everybody, judging by recent correspondence, would agree with my selection of the Pearl Gourami (*Trichogaster leeri*), but some magnificent specimens were available locally, and I took the plunge. As the males were in full colour—a sight impossible to do justice to on paper—their impact on the tank was impressive, to say the least, but I was a bit worried as to how things would go if the pair took spawning at all seriously. All that happened for some time was that the male chased his partner behind the cork bark at the rear of the tank, from which she emerged at feeding time. The male then took up a

position in the forefront of the tank and carried out a fairly peaceful patrol. None of the species mentioned above came to any harm, and if anything, the female gourami got more rough stuff than the others. Several bubble nests were built, but were just as rapidly broken down. I sensed that the female was not very fruitful or interested—possibly an older fish beyond its best. It is something of a pity that the colouring of the male has diminished considerably since introduction. Possibly the presence of other males is an aid to continued display, but in the interests of law and order, this would probably be a mistake. The gouramis are, as a group, somewhat unpredictable in temperament, and I consider myself fortunate that things have developed peaceably. Others have not been so well served; nor, as it happened, did species subsequently introduced hit it off completely with these large fish, as I will describe in my next article.



HEATERS, THERMOSTATS AND THE SILICON CHIP

New Thermostat from UNO Products

UNO are to launch a new highly accurate thermostat in April.

With the advent of electronics in the consumer market it was obvious to Uno Products some two years ago that the viability and prosperity of the thermostat market would be increasingly geared towards the introduction of the silicon chip.

During the last two years Uno have spent nearly £15,000 on research and development and have engaged the services of highly qualified staff to both advise on and develop new products.

The first of these will be on show for the first time at the British Pet Trade Fair at Harrogate in April.

Uno think demand for their new thermostat will gradually supersede the bi-metallic thermostat despite the price differential.

The accuracy of the new unit is plus or minus $\frac{1}{4}^{\circ}\text{C}$ compared with plus or minus 2°C on bi-metallic and there will be no moving parts which will automatically eliminate problems caused by sticking contacts.

A marine aquarist who has invested upwards of £200 in his fish and aquarium will no doubt prefer the peace of mind the new thermostat will offer.

The 'stats will also be sold for photographic and home brewing equipment.

As an added safety feature there will be a warning light which will tell the aquarist if there is a heater failure, in addition to the usual neon which indicates when the heater is on or off.

Electromatic Combined Heater/Thermostat

THE SILICON CHIP comes to aquarium keeping with the new electrical combined heater/thermostat. This unit, designed and built in the U.K. at Interpet's Dorking factory, combines a very accurate temperature control with a sensible price. It can be built to conform either to the U.K. Electrical Safety Regulations or to the various other worldwide standards. Interpet anticipates many other uses for this technological advance such as for the accurate control of constant temperature baths in laboratories, photographic baths and homebrewing.

For further details please contact: Peter Webb, Interpet Limited, Interpet House, Curtis Road, Dorking, Surrey RH4 1DP. Tel: (0306) 883202; Telex: 859115 CARIN G.

NEW PRODUCT FOR POND MARKET

The Pond Protector

THE Interpet Pond Protector is an ingenious new product designed to keep a layer of air under the ice. No electricity or other power is required and the dealer could sell this as a product positively needed by every pondkeeper.

For further details please contact: Peter Webb, Interpet Limited, Interpet House, Curtis Road, Dorking, Surrey RH4 1DP. Tel: (0306) 883202. Telex: 859115.

Meet the Aquarist - 9 & 10

by Frank Orme



Bill Ramsden N.G.P.S.

AROUND THE goldfish circles the names of Bill Ramsden and Brian Rothwell are well known as two inseparable companions. They first met about fifteen years ago and since then have spent hundreds of hours together. Both are committee members of the Northern Goldfish and Pondkeepers' Society, and were instrumental in organising that society's first major open show—to which they both did, and still do, take a leading role in the planning and hard work that is required to stage such an event successfully. As expected, these two enthusiasts are reluctant to accept any credit for their efforts; they insist that every member of their society should receive equal credit for the part which they play in arranging this show.

Both are successful exhibitors of their fish, and have won awards at many of the leading open shows including Bristol and the British Aquarists' Festival at Belle Vue,



Brian Rothwell N.G.P.S.

Manchester. Together they visit various societies in northern counties area to lecture about fancy goldfish; they attend conventions; accept numerous engagements to act as judges to shows organised by societies affiliated to the Federation of Northern Aquarium Societies, plus some major shows—this year they will judge for the third year running at the BAF. Not content with those activities they still visit each other, alternately, and spend long hours discussing the goldfish and allied topics.

The character of these two 'fanatic' goldfish enthusiasts differs in many ways, yet each compliments the other in such a way that they make an ideal team whilst, at the same time, remaining individuals with their own ideas and methods—neither dominates the other, but is prepared to listen to the other's viewpoint and consider it.

It was in 1950, when he was 24-years-old, that Bill Ramsden was given a tank and two common goldfish. Requiring food for the two fishes, he visited a pet-shop where he met the owner—Mr. Edgar Charlton—who showed him his tropical fishroom. He was interested to see so many types of colourful fish, and began to help Mr. Charlton in the evenings. The shop had a cellar which Bill cleared out, plastered and decorated to turn it into a room for coldwater fishes. Shortly after that he began to work full-time in the shop. However, having a young family he had to leave for better paid employment. Nevertheless, the seeds of his later interest had been sown.

His interest was fired still further when he was successful in spawning a pair of shubunkins, and raised the young, in two 24 inch by 12 inch tanks. A little later, during that same year, he visited the British Aquarists Festival and saw, for the first time, some of the many different varieties of fancy goldfish and that cemented his interest.

Shortly after the Northern Goldfish and Pondkeepers' Society was formed he became a member, and began to concentrate on raising fancy goldfish, that was in 1959. He built a small lean-to fish-house out of old window frames into which he placed a number of 24 in. x 12 in. x 12 in. tanks. There he commenced to give serious attention to raising, and improving, his own stock. He became secretary of the society in 1962, and remained in position until 1967. At the present time he is President of the NGPS. He began to exhibit his fish, with good results, in 1960.

Subsequently his home, 18 Ainsdale Road, Great Lever, Bolton, Lancashire, saw the lean-to demolished and replaced with a much larger fish-house. This is attached to the rear wall of the house, and affords a view of the interior from the kitchen window. The large, all-glass tanks are set in three two-tier rows and contained some large, healthy specimens of moors—which Bill Ramsden has specialised in for the past seven years—together with some nacreous veiltails. His great ambition is to produce a really outstanding fish.

His advice to novice goldfish keepers is to apply dedication; never delay attending to a job just because you do not feel like it. A missed feed may not be noticed—but, it can never be made up!

BRIAN ROTHWELL, who lives at 4 Whalley Road, Hale, Cheshire, was for ten years a keen angler. During that time he kept a number of native species of coldwater fish, and would carry home common and crucian carp, in wet rag, from the local park to be placed in his pond.

In 1961 he moved house, at which time a neighbour gave him some shubunkins. It was from those early fishes that his obsession with the Bristol shubunkin began, since that time he has created a fine strain of this particular variety, and their quality is now well known on the show benches.

It was in 1962 that he became a member of the Northern Goldfish and Pondkeepers' Society and he took an active

part in its activities, becoming secretary in 1967; he held that honorary position for six years before becoming the society treasurer, a post which he has retained up to the present time. He has also acted as the NGPS, show secretary; was, together with Bill Ramsden, a delegate and founder member of the Association of Goldfish Societies of the United Kingdom; jointly they served upon the committee which produced their society standards for fancy goldfish and attended many meetings with the Federation of Northern Aquarium Societies in order to discuss goldfish standards—or any other matter connected with the goldfish hobby.

Brian began to exhibit his fishes seventeen years ago and has visited most of the major shows with success. Like his friend he has been a judge of fancy goldfish for the past six years, and succeeded in breeding and raising his first shubunkins in 1963.

At his home he now has two ponds, one being quite large which is divided to form individual sections when required. In addition there are two fish-houses. Whilst one is the more usual type—being a greenhouse of aluminium construction—the other is very unusual. It appears quite ordinary from the outside, but the inside is like a 'fairy grotto' with large glass tanks set into rock-like structures. There is also an abundance of aquatic and other plants which adds to the attraction.

Within the fish-house Brian employs a water-exchange system of dripping water and overflows that effectively maintains the clarity of the aquarium water. He stresses that, in his opinion, the condition of the water is of paramount importance.

As might be anticipated, numbers of good quality Bristol shubunkins were happily swimming in the spacious, clean tanks. There were also some nice nacreous veiltails but, most noticeable were some common goldfish of a really deep reddish colour. These fishes are owned jointly by Brian and Bill, the former being responsible for breeding the stock; the young are then passed to Bill Ramsden for growing on. It came as no surprise to learn that one of these fish had taken, amongst other awards, Best coldwater fish in Show at the British Aquarist's Festival.

In general, Brian looks forward to seeing an even closer relationship between the various coldwater societies, built upon the friendship which already exists within the hobby; on a more personal level he would very much like to produce a 'perfect' Bristol shubunkin. He advises the novice goldfish keeper to concentrate upon only one variety and endeavour to improve its quality by line-breeding, keeping a written record of the various matings and the results obtained.

These two enthusiasts have no hidden secrets, they maintain their stock under similar conditions to those used by other hobbyists, and use a combination of commercial and live foods for their fishes diet.

Although describing themselves as 'fanatics' they are both, like most fishkeepers, two very friendly people who are ever ready to advise the beginner and help him or her to make a success of a hobby which they have enjoyed for many years.

Continued from page 41

bearer enthusiasts) but during this period the two did not seem interested in eating. When they were feeding—I received a clear 'picture' of how predatory these fish could be. They hang midwater in the aquarium, motionless until prey comes within an inch or so—when they do the strike it is instantaneous; the leaf fish moves forward and throws its jaw at the prey, with a split second retraction. They rarely miss and it is easy to see how they must be efficient hunters in their native South America, stalking and pouncing with seeming ease. To be camouflaged as a leaf certainly has its benefits.

Several days later the pair began to spawn again and this time I was ready with the camera hoping to capture all the spawning on film. The female deposited at least forty eggs on the underside of a leaf and the male—with each deposit of the female's six or so eggs, followed through to fertilise them.

Female depositing eggs.



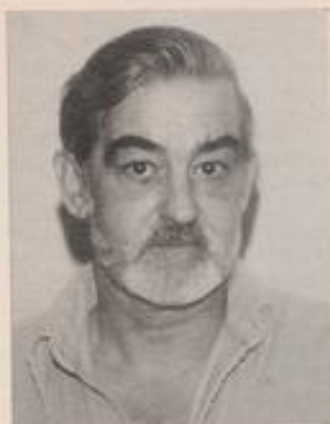
Once the spawning was complete the male took charge of the eggs and drove the female away (in a cichlid manner), I then removed the female to another tank.

He stayed alongside the leaf and its suspended eggs for six days, when they eventually emerged from the eggs. At a day old, the fry appeared to be bits of leaves, (not surprising) half brown, half white; at this point I removed the male.

I fed brine shrimp from the first day onward but was unsuccessful in raising any of the fry. Perhaps they required a specialised diet or needed the presence of the male. I did not obtain further information because shortly afterwards I lost both fish (one decided to vacate the tank). The pair had provided an interesting insight into the breeding behaviour of leaf fish and for this I am grateful.



The eggs—hung on a sticky thread. The fry are about to leave the eggs on the 6th day.



Coldwater Jottings

by Frank W. Orme

IMPOSSIBLE. Ridiculous. For weeks the temperature in the fish-house had stayed sufficiently low to keep the fishes in a semi-dormant state. Yet, on a Saturday morning during late February, an inspection revealed unusual activity in a tank containing a few Bristol shubunkins. Such activity warranted more than a casual glance. The thermometer showed the water temperature to be only 60°F. (15.6° C.), no doubt it had been warmed by the sunshine—which had also coaxed me into making this early morning visit—however, the degree of warmth was hardly high enough, nor had it been sufficiently prolonged, to encourage the fishes to indulge in a spawning. It could hardly be said that they had been conditioned in anticipation of a spawning, in fact they had received no food for some weeks due to the cold temperatures that had prevailed. Nevertheless it certainly looked as though a spawning chase was taking place, but surely I must be mistaken. I peered more closely into the tank and, to my disbelief, yes, they were most definitely spawning in a most vigorous fashion, and numerous eggs could be seen.

The lionheads, in tanks occupying a similar position to that of the shubunkins, were not exhibiting any undue activity—much to my relief—and, quite obviously, had no intention of emulating their neighbours. I placed a couple of nylon wool mops into the tank, with the idiotic shubunkins, thinking it a pity to allow their foolish activity to go to waste. I then went back to the fireside, where I told my wife about the spawning. "Its absolutely ridiculous," I said, "one little spell of sunshine and they think spring has arrived." She replied by reminding me that "you usually say it is a sign of approaching good weather, so perhaps we are in for a slightly warmer spell." Well, it was

true that I had often noticed that the fishes seemed to have an instinct for the best spawning weather. Perhaps they knew something that the Weatherman didn't.

Later that day I returned to the fish-house to place the mops into a warmed tank where they could stay until the eggs hatched. Having done this I again locked the door of the fish-house, before going back indoors, and noticed that a very fine snow was gently drifting down—almost too light to notice. By the time we retired to bed the ground had become a little white in places, but nothing to cause any comment. The following morning, however, how things had changed; the snow covered the outside scene to a depth of around a foot—by evening it had built up to a depth of eighteen inches, and was freezing. It was now obvious that the lionheads knew best, and that the shubunkins had been reacting to, I suppose, a false instinct. As I said at the beginning: "impossible, ridiculous" for, in nature, their eggs would not have survived.

Scottish Goldfish keepers

Sometime ago I reported the formation of a Scottish group of goldfish keepers. I was therefore pleased to receive a copy of their January newsletter, which comprised 7 pages of closely typed A.4 size paper. Of particular interest was the fact, gleaned from the members' contributions, that the group appears to favour keeping their goldfish cold during the winter months. Some of the hardier varieties apparently remain in their ponds throughout the whole year. It seems to me that if these Scottish enthusiasts can acclimatise their fishes to withstand the

Continued on page 55

What is Your Opinion?



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

OCCASIONALLY I AM asked why I do not make mention of particular 'club' magazines in my feature. The simple reason is that I just don't have enough space to include all the letters that I receive, and, obviously, I'm unable to mention every magazine for the same reason.

Prominent amongst the specialist publications that I receive on a regular basis—even though I do not keep any of the fish featured in them—are those dealing with koi. The publications are: The Magazine of The British Koi-Keepers' Society, edited by Mr. W. Fowler, 84 Jodrell Road, Whaley Bridge, Stockport, Cheshire; 'Koi', the Journal of the Yorkshire Koi Society, edited by Mr. S. Farrar, of 7 Moor Green, Nunthorpe, Middlesbrough, Cleveland; and the Newsletter of the Midland Koi Association, the secretary of the M.K.A. being Mr. S. Carey, of 49 Conway Avenue, Tile Hill Village, Coventry. I can recommend these publications to those who keep koi; no doubt membership of one or more of these bodies would also be of interest to koi fanciers.

I was pleased to receive a copy of the latest edition of the Federation of British Aquatic Societies latest Bulletin—together with a letter from its editor, my friend Mr. Dick Mills, who resides at 70 Lee Road, Greenford, Middlesex. Dick, in his letter, says: ". . . A line in a recent *W.F.O.* caught my eye—the subject of incandescent bulbs used in aquaria. There was some conversation on this some time ago in my own Society's circle—

Ealing & District A.S.—when the matter of the bulbs' short life was raised. One answer was to use Rough Service lamps—similar to the type used in G.P.O. (sorry, British Telecommunications) telephone boxes. Another way to prolong their life was to underrun them, i.e. wire them up in series instead of parallel so that two bulbs would be running at half voltage—dimmer lights, so use two 60 watt bulbs wired this way instead of two 30 watt bulbs conventionally wired. One effect of using bulbs in this fashion is that the colour of the light is affected—which may give rise to alarm at first.

"From these ideas, even more ways were advocated—even down to the way the bulbs were mounted in the reflector. . . . Finally, the one main reason for the short bulb-life was put down to the very high temperatures generated in the reflector due to poor ventilation; if you can bear to have projected circles of light from the hood appearing on your lounge walls and ceiling then a few more ventilation holes made in the hood may prove beneficial in the length of bulb life, and it will also prevent the surface layer of water from over-heating and the leaves of floating plants from being scorched."

Dick illustrates his comments about how bulbs are mounted in their reflector with two diagrams—which, unfortunately, I do not have space to reproduce; however, his written comments should make sense to anyone who has seen the interior of a light bulb; and obviously it's difficult to see the interior of a pearl bulb, whereas the inside of a clear bulb is transparently obvious. As you know, there is an opening in the filament inside the bulb. Dick says: "Bulb mounted with opening in filament uppermost—heat from the filament escapes into glass envelope. Bulb mounted with opening in filament downwards—heat from the filament overheats the top section, thus possibly weakening it."

I've used most types of aquarium lighting myself over the years and still think that ordinary tungsten bulbs are as good as any light source for growing plants. Had I to install any combination I should prefer an ordinary (non-coloured) fluorescent tube and a tungsten bulb. I tried and abandoned Rough Service bulbs some years ago because they were quite expensive; but, more importantly, although they did last much longer than ordinary bulbs the colour of the light seemed to change and become rather orange as time passed; also the bulbs appeared to emit rather less light and rather more heat as time passed.

One of the problems associated with ordinary bulbs is the fact that we use them horizontally over our fish tanks, whereas they were designed to work hanging vertically—in which position the full length of the filament in the bulb is evenly supported. The atmosphere above a fish tank tends to have a high level of humidity; although I do not think that this affects the life length of the bulb. I agree with Dick's opinion that the confines of the aquarium hood cause the bulbs to over-heat and thus have shorter life spans.

Over a period of seven months I've been trying rather expensive bulbs that are supposed to have an extra long life. I'd hoped to be able to recommend them to readers; but, unfortunately, I've found that the dozen or so that I bought and used lasted no longer than ordinary bulbs in the same environment. (No doubt such long-life bulbs do last much longer in the ordinary, open environments for which they were designed.) Two of those that I bought lasted only a few days—and I had no qualms about taking them back to the shop where I bought them and asking for replacements. (I kept receipts and a written record of when specific bulbs were placed in specific tanks.)

I've now reached the conclusion, rightly or wrongly—and I hope you will drop me a line if you disagree—that cheap bulbs are probably as good value as, if not better value than, any other types. I prefer clear bulbs to pearl bulbs because I can see inside them and can thus easily turn the bulb holders in my tanks such that I can insert bulbs with the opening in the filament uppermost. The best value in clear (or pearl) bulbs that I've found recently has been in my local branch of Woolworth where packs of four bulbs of the same wattage (I prefer 40 watts) bearing Woolworth's own Winfield brand name have cost only 95 pence, i.e. about 24p each. I prefer the conventionally shaped bulb to the squat types because I think the conventional ones allow more heat to escape—even if only into the aquarium hood. (A 60 watt pearl bulb of the same type costs 30p if bought as a single unit.)

I bought a pack of four bulbs last week and when I tried to use the fourth one I discovered that it lacked one of the two little horizontal metal pins that hold a bulb in a holder. I took the bulb back to the shop and had only to ask to have the bulb replaced with a new one. While there I bought another pack of four bulbs. I'm keeping a written record again and will report any findings in a later issue. Please drop me a line if you have any observations on bulbs; or know of places where cheaper bulbs may be bought. I live in Northern Ireland where, unfortunately, prices of most things—especially fuels—are much higher than in other parts of the country.

As always, the F.B.A.S. Bulletin contains a wide variety of interesting items—including photographs of the F.B.A.S. National Fishkeeping Show, at which the prizes were presented by Miss Lalla Ward (whom I haven't had the pleasure of meeting), wife of Mr. Tom Baker, of Dr. Who fame (whom I have had the pleasure of meeting).

Dick Mills also kindly sent me a copy of the latest F.B.A.S. publication—Booklet No. 2, entitled 'The Sunfishes'. This little booklet, of 29 pages, deals with 26 species of sunfishes—ranging from the mud sunfish, *Acantharchus pomotis*, to the white crappie, *Pomoxis annularis*.

Photograph 1 shows an *Anoptichthys jordani*, the blind cave fish or blind cave tetra. I find the fish very interesting because of the way evolution adapted it for life in its original environment; however I must admit that I do not greatly like the look of the fish and have never kept the species myself. Please drop me a few lines about *A.*



Blind cave fish—*Anoptichthys jordani*

jordani if you have kept it. The fish in the photograph belongs to 14-year-old Robert Robinson, a young aquarist who kindly permitted me to photograph his fish. I also photographed and interviewed Robert—who will feature in a forthcoming *Meet the Aquarist* article.

Mr. B. C. Hall resides at Auclaye, Wolves Hill, Horsham Road, Capel, Dorking—a town that I visited some years ago at the kind invitation of Dr. J. Neville Carrington, of Interpet, also based in Dorking. Mr. Hall writes: "With regard to your purchase of *Cryptocoryne usteriana* and *Cryptocoryne balansae*, I would beg to differ with my namesake. These are not the same plant. Indeed, even a casual perusal of the two photographs you printed in the January issue of *The Aquarist & Pondkeeper* will show this to be true. The confusion probably arises from the fact that both plants have heavily indented leaves. However, the leaves of *C. balansae* are narrower than those of *C. usteriana* and have a tendency to curl, while those of *C. usteriana* are straight. On one point he is correct. *C. usteriana* and *C. apomgetifolia* are one and the same plant.

"If ever your *Cryptocoryne* plants attain full size the difference will be even more obvious. *C. balansae* attains a leaf length of about 60 cm. on a 15 cm. stalk. *C. usteriana* attains a leaf length of 150 cm. on a 30-40 cm. stalk."

Thank you, Mr. Hall. Now, I trust you won't mind if I take you to task about the other comments in your letter. I think you must have made a somewhat "casual perusal" of what I wrote and what I quoted in the January edition—beside and beneath the two photographs of *Cryptocoryne* plants. The comments on which I based my conclusions, in the January issue, were made not by Mr. Hall but by Danish expert Dr. Jens V. Bruun; and Dr. Bruun obtained his information directly from Danish botanist, Niels Jacobsen, an expert who has made a special study of *Cryptocorynes*. Dr. Bruun, who is chairman of the Danish Aquatic Union, published an article about and some photographs of *C. usteriana* in the March 1980 issue of this magazine. In his article he mentioned the difference between *C. balansae* and *C. usteriana*. In the July 1980 issue I included a letter



Lace plant—*Aponogeton* species

from Mr. M. Hall in which he asked where he could obtain plants of *C. asteriana*. I said that I did not know and had not heard of the plant—at that time. Soon afterwards I came across the plant in *Aquarium Plants*, by Rataj and Horeman (T.F.H. Publications, 1977).

Subsequently Dr. Bruun read Mr. M. Hall's letter and sent him a reply; and the good Doctor kindly sent us a reply for publication. It was Dr. Bruun who informed us that "*Cryptocoryne asteriana* is better known under the names *C. balansae* and *C. aponegetifolia*—which are synonyms. . . ." Dr. Bruun then gave Niels Jacobsen as the source of his revised information. I am not an expert in the classification of plants therefore I have to accept the findings of those people who are considered to be experts. Most of us rely on reference books for our information; but re-classification often occurs at a rate that makes some parts of some books out of date soon after they have been published. I suppose most of us buy monthly magazines associated with different hobbies because they often contain articles by or about experts and include the most recent information about specific topics.

My two plant photographs will do little to solve this interesting debate. It is amusing to note that Mr. B. C. Hall uses my two photographs in the January issue to support his view that *C. balansae* and *C. asteriana* are different species; while I used them to support the view that they are the same species.

I suppose the truth is that one would have to collect flowering material from both plants in order to decide whether or not they are the same species; or whether or not different species. Possible leaf lengths of 150cm. won't affect me too much: my longest tank is 30 in. in length. On the other hand, I once grew a *Cabomba* plant in an 18 in. tank and it reached a length of over 5 ft. I'll keep an eye on all my *Cryptocoryne* species and on my *Aponogeton* species too.

Photograph 2 shows one of them—a lace plant, beside some Java fern. Readers may be fascinated, or bored, to learn that my enigmatic *Aponogeton ultracicus* has started to grow at last. It carries about nine leaves, several of which are growing quite big. It started to grow, finally, when other *Aponogeton* species introduced into the same

tank began to sprout leaves. I suppose it could just be a coincidence; but I don't think so. I suspect that the other *Aponogeton* species released some chemical substance that started the dormant *Aponogeton ultracicus* into growth. What is your opinion?

Another club publication to reach me recently was the Newsletter of the Scottish Goldfish Group (Branch of Goldfish Society of Great Britain), edited by Mr. Tommy McLean, of 36 Corston Park, Craigshill, Livingston. It contains an interesting selection of information for those keen on this branch of our hobby.

Mr. M. D. Moulder kindly let me see a selection of attractive monochrome prints and coloured slides he took of some of his fish. He took the photographs using electronic flash and a Pentax camera set at f/16. Fish photographed included *Pseudotropheus*, *Tropheus*, *Aulonocara* and *Haplochromis* species, many sporting beautiful bright colours.

I recently glanced through the letter I published on page 22 of the February edition under the heading 'Plurals.' It concerned gouramies, potatoes and tomatoes. Those who found the typed letter somewhat confusing must have been even more confused by an additional error that someone introduced into the fourth sentence from the end of the paragraph. The sentence should have read: "I'm left wondering about 'potatoes' and 'tomatos' . . ." Someone kindly changed the spelling of the name of the plural of the first-mentioned vegetable making its printed spelling correct. I'm still left wondering—although I'm still not too sure what I'm wondering.

I leave that subject quickly and move on to a letter written by Mr. A. M. Gould, who lives at 108 Finham Court, Wakley Road, Rainham, Kent, and says: "I have been keeping freshwater tropical fish for about six months and have spent many hours getting my 30 in. x 18 in. x 15 in. all-glass tank up to standard. I have three angelfish, three black mollies, one swordtail, two pearl gouramies, one fighter, five neons, five zebras, five glowlights, one three-spot gourami, two black widows, four guppies, one flying fox and two catfish. I know I have gone over the recommended fishes/inches/water ratio but this was not intentional as I had planned to purchase a second tank but funds did not allow this. Anyway, the fish do not look overcrowded or unhappy. I tried a Lok-Rock kit and was very pleased at the effect I achieved; and they are very realistic—not like the artificial-looking, plastic plants that are on sale.

"I started off with a (named brand) thermostat but as after two replacement units still refused to allow the temperature to rise above 72°F my local shop exchanged it (them) for an external model and up to now—touch fish—I'm very pleased to say it holds the temperature dead on 78°F, with only a 2°F drop before switching in the heater again. I use two under-gravel filters and airlifts and have a battery-powered pump and heater wired into the

mains pump and heater via a relay, so that when the mains current is disturbed for some reason the relay switches the battery-powered equipment into circuit.

"One thing that bothers me is that looking under the bottom of the tank at the base of the U/G filter I notice that it seems very clogged up and I know this shows it is doing its job; but won't it need cleaning quite soon to function efficiently? I used to feed both live *Tubifex* and *Daphnia*, together with flake food, but I was put off after reading about the increased chances of infecting fish with micro-organisms. For four months now I have been feeding only on flake food and my fish still glow with colour and energy. My black mollies have just given birth but, unfortunately, the babies were all eaten."

The third photograph is of a common goldfish—and leads me to a letter from Mr. Tony Jacques, Flat 12, Durham Close, Durham Road, London, S.W.20. Mr. Jacques says: "With the present ever-increasing cost of electricity, I am sure that many tropical fish-keepers are considering the option either of reducing the number of tanks or changing over to coldwater fish."

"Recently I made the latter transition, following some years of keeping tropicals, after being inspired by Mr. L. E. Perkin's excellent photographs in Mr. Jack Hems and Mr. George Hervey's classic, but now, sadly, out-of-print book, *The Goldfish*, to obtain some pearl scales. For the benefit of readers who are not familiar with the many types of fancy goldfish, this is a variety originating in China with a body shape similar to the fantail, but the scales appear as 'cockleshells' and are turned up giving a distinctly armoured appearance.

"Here was my first problem: none of my usual aquatic shops stocked or even knew what a pearl scale was; but after some weeks of phoning around I located a garden centre with a new supply due of Japanese imported fish—including the required variety. Now came the second problem—which was caused by my own over-confidence and ignorance of exactly what to look for in fancy goldfish. Off I went to get nucleus of my future breeding stock and chose what looked like a dozen healthy young fish with a body size of 2½ in.-3½ in.—a mixture of metallic and nacreous types. Only later, when I obtained a copy of *The Goldfish Society of Great Britain's Standards* did I realise that many of the fish were grossly over-finned by Western views and therefore no use for show purposes. With hindsight, they appeared to have a high proportion of veiltail blood somewhere in their heritage. So the worst of the batch were given away and the best kept to be grown on.

"As appears to be normal with imported cold-water stock, a few died within the first month or so showing no external signs of disease. Stress due to travel and changes of water, etc. seemed the most

likely causes, and a few outbreaks of finrot and fungus were successfully treated with salt and clean conditions, i.e. bare tanks with good filtration. Since then I have joined both the B.S.G.B. and the South Park Aquatic (Study) Society because living in Wimbledon I am lucky enough to be within easy reach of two goldfish/coldwater clubs. Here the advice and knowledge available from experienced members has been invaluable—with the added bonus of my being able to obtain good-quality, U.K.-bred fish. In addition to pearl scales I have also acquired half-a-dozen young globe eyes which now appear to be becoming a rare variety due to the rise in popularity of the veiltail moor. Hopefully I shall breed from these next year, tank space allowing, and be able to let some more prospective breeders have a few.

"I was used to certain tropicals that reproduced like peas in a pod and the mixed batch of youngsters I got from my first spawning of pearl scales had to be seen to be believed; and from a batch of around 200 fry only five reasonable fish were left after culling out all those with single dorsal and anal fins, poor body shape, colouring and lack of pearling, etc. So it's obviously going to be a long, hard road to establishing and maintaining a decent strain. In fact, the general difficulties of producing good fancy goldfish can be likened to line-breeding guppies or platies coupled with the same sort of maintenance necessary for big cichlids, i.e. regular, partial changes of water and adequate space.

"So, coldwater fish certainly offer a challenge to fishkeepers and I am sure that any aquarist contemplating the change-over from tropicals to coldwater will not be disappointed. In fact, I was surprised at how good a display tank can look with a few pairs

A common goldfish





Veiltail goldfish

Photo: L. E. Perkins

of veiltails, moors, pearl scales, orandas, etc; but I would certainly urge anyone to obtain a copy of the G.S.G.B. Standards and if possible join a club before you purchase any fish. Also, both Arthur Boarder's *Coldwater Fishkeeping* and Frank Orme's *Fancy Goldfish Culture* make excellent reading and are full of useful tips and information.

"By the way, I have recently added *Nuphar luteum* to my 24 in. front room tank, and it is thriving in a flowerpot with a mixture of peat, soil and gravel at normal room temperature under two 15 watt Gro-Lux tubes on for about 12 hours a day. The water is on the hard side, with a pH of 7.2. New shoots and leaves are regularly appearing. The plant was supplied in very good condition by Everglades Aquatic Nurseries, of Cirencester. This company really does seem to offer a very good postal service for aquarists.

"To close, I should like to echo your sentiments in the December issue of *The Aquarist* by wishing Jack

Hems a speedy recovery and I look forward to reading his contributions again before long." (By the way, *Nuphar luteum* is a spatterdock. B.W.)

Perhaps our editor, Mr. L. E. Perkins, will find a little extra space to include one of his famous photographs of coldwater fish. I managed to buy a copy of *The Goldfish*, by Hervey and Hems, several years ago. The book, first published in 1948, was revised in 1968; it was reprinted in 1968 and in 1974—the latter date being the year in which my copy was published by Faber and Faber.

Master Steven Woodham is 14-years-old and resides at 657 Blandford Road, Upton, Poole, Dorset. Steven says: "... I have two 36 in. community tanks, one of which contains mainly barbs and other large fish, including a horse-faced loach that spends much of its time under the gravel. The horse-faced loach was purchased in January, 1980, and after its introduction it went under the gravel and wasn't seen for about six months, until I sold my 6 in. weather loach—which had kept digging up the plants; now I see it more often.

"In August, 1980, I purchased two freshwater lobsters, which I think are a pair. They look very

similar to crayfish. The one I think is a male has cast his skeleton twice; and the female only once.

"In one of my tanks I have had problems with blanket weed, although it is well planted. Have you any suggestions as to how to clear it? Also in this tank I have a lot of ramshorn snails which have been eating my dwarf lily plants. The tank is lit by two 40 watt bulbs."

A test-tube cleaning brush, or possibly some of the brushes supplied to keep filter tubes clean, could be used to reduce the number of filaments of blanket weed in your aquarium. Insert the bristles of the brush into patches of the weed and revolve the brush handle. The weed should wind round the bristles—from where it could be removed. Repeated twirlings of the brush would help to control the growth of blanket weed. A garden rake can be used in a similar way to remove blanket weed from a garden pond. After removing blanket weed (an alga) from the tank one could treat the tank with a suitable brand of aquarium algae killer to kill off any remaining algae plants. I prefer an algae killer that is sold in tablet form. Follow the manufacturers' instructions *exactly!*

The fifth photograph shows *Hemigrammus ocellifer*, the beacon. Please drop me a line if you have kept and bred this attractive little fish.

For a future feature please send me your opinions on some of the following: (a) light bulbs; (b) the cost of keeping tropical fish; (c) the attractions of coldwater fish; (d) aquarium, fish or plant books that you would recommend to other aquarists; (e) the garden pond in May; (f) breeding any cichlids; (g) dwarf aquarium plants; and (h) the reliability of aquarium heaters, thermostats and combinations. I'll look forward to hearing from you.

As an experiment this month I've asked our printers to set up actual readers' letters and quotations in **BOLD** type to give you the contrast of three different typefaces. I'll look forward to your opinions on the result—by which time I'll have had an opportunity to form my own opinions on the experiment. I hope it will make *W.Y.O.* visually more interesting. Goodbye until next month.

The beacon—*Hemigrammus ocellifer*



May, 1981

Coldwater Jottings—Continued from page 49

northern winter temperatures, those who live in more southerly areas should also be able to keep their stock without recourse to any artificial warmth during the colder months. As I think I have mentioned on previous occasions, my own lionheads and veiltails overwinter in coldwater conditions and seldom come to any harm.

The Scottish Goldfish Group holds quarterly meetings, and stages an annual open show of goldfish. The 1981 show will be held on the 29th, of August, in Dunfermline, and trophies and plaques will be awarded to successful entries. The group is also investigating the possibility of bulk-buying various items such as flake foods, accessories and show tanks; these would be sold to the members at competitive prices, thus helping to keep down their overheads.

The secretary of this enthusiastic group is Mr. Tommy McLean, and he would willingly give any interested readers full details of the Scottish Goldfish Group if they care to write to him, enclosing an addressed and stamped envelope, at 36 Corston Park, Graigshill, Livingston, West Lothian, Scotland.

Incidentally, one of the earliest open shows, for coldwater fishes only, is generally held during June at the Wimbledon Community Centre. The organisers are the South Park Aquatic (Study) Society and their show caters for all coldwater species. Further information can be obtained from Mr. L. B. Clapp, 16 Overhill Way, Beckenham, Kent.

Keeping Fish

Fish Keeping, as a hobby, has a varied and wide appeal, as is plainly demonstrated by the diversity of people who take it up. Many first become interested as children, retaining their interest into their adult lives. Others become interested much later in life, possibly as an extension of their activities as an angler.

These interests may be satisfied by the possession of a decorative, indoor aquarium, or an ornamental garden pool set into a neat lawned area. However, the interest will cause others to become much more involved. They will endeavour to learn as much as possible about their hobby, studying the lives and habits of their fishes. A desire may be kindled to breed their fishes, which, of necessity, results in the acquisition of further tanks. For people who are interested in breeding animals, fish are ideal since they present all grades of difficulty, and the novice can begin with something simple in order to gain experience. Then there is the aquarist who keeps fish largely for the purpose of entering them in shows. In fact there are many interests and reasons why people become fish-keeping hobbyists.

The reason does not matter; all that is important is that the aquarist enjoys keeping fish and the fish enjoy being kept. It must always be remembered that pets, of any description, are very dependent on their owner and as they are kept for pleasure the owner is morally obliged to provide them with the very best of conditions and attention. This is a responsibility which no caring aquarist should neglect, and is essential if the pleasure of keeping fish is to continue.

55



The wide range of Jungle Products which are being imported from the United States by J.M.C. Aquatics of Sheffield, includes filters, filter pads, food, sea water mix and a range of disease cures and water additives.

Product Review

An impressive range of products

FOR THE LAST three months or so I have been steadily working my way through the Jungle.

Not out in some exotic location searching for some new species of fish, but at home surrounded by Bio-Magnets Ocean 50, Mono Lake Flake, Molly Bright and a host of others.

I have been testing a new range of products from America under the 'Jungle Laboratories' brand.

They have been imported by J. M. C. Aquatics of Sheffield and, after using as many of the products in the range as possible, I must say that I am impressed.

The undergravel filters have been put to work keeping my main 48 in. x 18 in. x 12 in. display aquarium clean and have done a very good job. They come in several sizes with new design uplifts and are marketed as the 'Miracle', which is the normal type filter, and the 'Bio-Magnet' which has the addition of a blanket of Dirt Magnet foam.

The extra layer of foam does mean that a slightly higher water turnover is preferable but that is a small price to pay for increased filter efficiency and water clarity.

In my 'temperate' tank two large Dirt Magnet filters are doing all the work. The 'Senior' is in one corner and 'Hatchery' in the other. They get well rinsed out once every three weeks or so and cope well with a community of about 40 fish up to three inches long. These filters are ideal for breeding set-ups as they can be used without gravel or even buried under the gravel in a corner. They are easily sterilized and being made of a very fine foam offer no risk of sucking in either eggs or fry.

The smallest Dirt Magnet now sits in my sons' turtle

tank. It keeps the water clear despite the efforts of four two-inch terror-pins! This is what Paul, my eight-year-old, had to say about it:

"The tank we keep the terrapins in was always getting dirty so one day my dad tried a new filter. He said it was a Jungle filter which sounded just what the terrapins needed.

"We took the terrapins out of the tank and my dad connected the air-line to the filter, made a space under the gravel, put the filter in the space and then put the gravel back on top of the sponge part.

"The water was stirred up and cloudy but we put the terrapins back in and fed them. The next morning the tank was lovely and clear."

The Dirt Magnet foam is also available in large or small pads for use in outside filters. It can be cut to shape and eliminates the need for filter floss or fibre. It acts as an effective medium for bacterial and protozoan life to flourish and so break down the waste products from the fishes.

Another product that has had a good test in my tanks is the Ammonia Sorber and this too seems to work well in extracting ammonia from the water. The crystals can be used loose in goldfish bowls, in outside filters or in the ammonia sorber filter. It is easily re-charged in salt water. There is also a water softener of similar design.

The new Mono Lake Flake fish food went down well with all my fishes and it is also suitable for marines. It claims to be the first biologically formulated food designed to give a balanced diet for all fishes. Among its impressive

list of ingredients are "Jungle's world famous brine shrimp from Mono Lake in the High Sierras."

Minimum crude protein is put at 42 per cent which compares favourably with other foods on the market.

Incidentally, Jungle claim a very high yield from their brine shrimp eggs and their hatching instructions are slightly different so they should be followed carefully. They produce green shrimps!

There is also a whole range of other products including things like Ocean trace blocks which dissolve slowly in the water to add trace elements; algae removing pads, including a soft one for plastic tanks; and Ocean 50 seamix which is a salt watermix containing 50 trace elements.

I have not been able to test the full range of cures and additives offered by Jungle as my fish have been remarkably healthy throughout the test period, I have however used:

Seri-clean to clean my tanks and equipment;

Clear Water, which does just that;

Molly Bright which is a copper citrate compound designed to add special 'livebearer' trace elements to the water and stop mollies especially from becoming uncomfortable;

Natural Colours, which does appear to help brighten up the fish by adding natural tannins and humic acid to the water;

Start Right which is a chlorine remover for tap water; and Plant Saver which is compound designed to lessen 'transplant' shock by adding 'electrolytes' to the water. It can also be added weekly to the tanks and I must say that my cryptocorynes have never been bigger or healthier!

I have not had to use the Aqualizer which raises pH or the Alka Right which lowers it as my tanks stay pretty stable around 7.2; nor have I had to use the Life Guard which is a white-spot cure; Fungus Stop which aims to live up to its name or Flouse which is a treatment for external parasites like fish lice, flukes and anchor worms.

It is an impressive collection that has already earned an enviable reputation in the U.S.A. and should carve itself a useful slice of the U.K. market as well.

Pumps

WHEN ANYONE claims that an air pump is 'silent' I tend to be rather sceptical. There are quiet pumps on the market—and there are others which need covering with a blanket so you can hear the telly!

When Ocean Aquatics (Wholesale) of Tyne and Wear gave me two of their newly imported Hoffman pumps to test I wondered just how quiet they would be.

No pump is ever completely silent because of the vibrations created by the magnetic arm, but these are certainly the quietest I haven't heard!

The 150 is a compact unit in the traditional style which delivers 150 litres of air an hour in 50 cms of water (roughly 35 gallons of air through 20 inches of water depth for those of us who haven't been metricated yet). I have found this more than adequate to handle the airlifts from undergravel filters and airstone in a four-foot tank of eighteen inches depth. A firm, thick rubber pad on



The interior of the Hoffman 3040 pump showing the positioning of the vibrating arm and the rubber sleeve which effectively damps any noise.

its base takes care of the vibration and eliminates virtually all but the quietest hum.

The 3040 is an upright cylinder design pump that puts out 300 litres an hour in 50 cms of water. It creates quite a turnover in even large tanks and would probably work several two-foot aquariums with the proper valve gear.

A marine aquarist friend of mine thought it would be ideal for his 48 in. x 18 in. x 18 in. saltwater set-up.

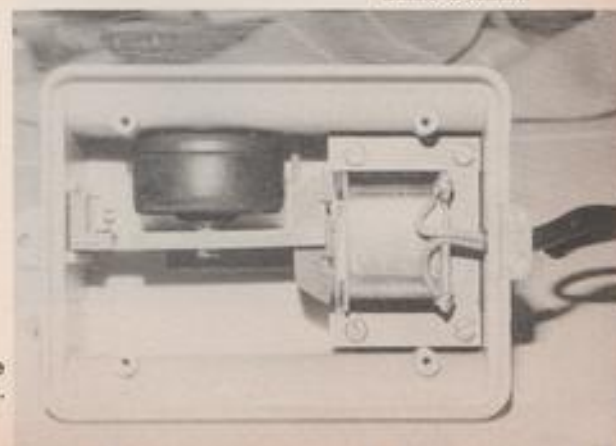
It is probably as silent as a pump can possibly be and it owes this to a rubber sleeve which fits over the vibrating arm mechanism and housing before the whole thing is slipped into the screw-top metal casing—which in turn stands on a rubber studded base.

Both pumps carry circular air filter pads in their bases and although diaphragm changing is a little fiddly, it is quite easily accomplished with the help of a pair of long-nosed pliers.

Neither model could be described as cheap but they appear to be of an excellent quality and, as far as a three month test could prove, very reliable.

The 150 costs around £8.60 and the 3040 around £18.60.

BARRY DURHAM.



Inside view of the more conventional Hoffman 150.



COLDWATER Queries

by Arthur Boarder

When breeding fancy goldfish in a pond and then in tanks, I find that the water plants I take from the pond with fish eggs do not live long in the hatching and rearing tank, which tank has no base compost in which the plants can grow. Can you suggest a plant which will be best for my purpose?

Hornwort, *Ceratophyllum demersum* is the ideal plant for your purpose. The stems are closely covered with thin leaves which hold fish eggs very well. However, its real value for you is that this plant never makes any roots and so there is no need to have any base compost in your

Hornwort



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.

hatching tanks and so it can be kept in a better condition without fear of any pollution from unwanted matter in the compost. This plant grows very freely, even in a deep tank. I used to grow masses of it in old cold water cisterns. Bunches can be made up as nests for the reception of eggs and anchored near the side of the pond and at the surface.

How often should I change the water in my garden fish pond? It is 11 ft. x 8 ft., and 2½ feet deep.

It should only be necessary to change the water in your pond once a year. This is best done in late autumn when any leaves from surrounding trees will have fallen. This is a good time to clean out the pond. During the rest of the year the pond may need topping up as water evaporates from it. In hot weather it is also a good idea to remove some of the water and replace with fresh. This is best done in the late evening, as it is during hot and thundery weather that the water loses much of its oxygen and the fishes can be in serious trouble during the night time. Golden orfe and any other large fish are soon in danger when the oxygen content of the water gets very low.

I intend to make a garden pond with a Butyl liner. As concrete slabs for the surround are expensive, is there anything else I can use which would be cheaper?

You should be able to get some broken paving stones from your local Council. These will be much cheaper and even safer. Fresh concrete can give off harmful lime and the old ones will have lost this and be better. When laying the surrounds see that the best straight edge is facing the pond and let it overhang about an inch or two. Once the row is laid, fit in the rest of the path to construct a crazy paving. This will look better than a straight type. If you fill in the cracks with cement see that it is kept away from the overhang.

Is it possible to produce an all black metallic goldfish and has a true albino goldfish ever been produced?

By metallic I presume you mean scaled. I do not like the term metallic as the scales of a fish have no likeness to metal. The moor is fully black with scales. I do not know if an albino goldfish has been produced. I have never seen one although I have seen very many white or silver (as they are called) goldfish with black eyes, but never one with pink eyes.

I am thinking of setting up a tank, 48 x 15 x 18 ins. in my garage for goldfish and shubunkins. I can arrange lighting for about 16 hours a day but I am wondering if the fish will be able to stand the cold in the winter without there being any heaters in the tanks.

It is not the fish you will have to worry over but the tanks. The fish you are proposing to use can stand the cold all right but if the water freezes then the glass could crack and this could be costly. If you have a couple of small wattage lamps in a hood over the tank, they will be able to keep the water from freezing. It is surprising how much warmth a 25 watt lamp can give off in a hood and if the lamps are switched on when a severe frost is expected, all should be well. There is no point in heating the whole of the tank, as goldfish will usually spawn better in the spring if they have been subjected to a cold winter.

My pond with goldfish has been functioning well for a number of years but a month or so ago, having added two Koi, I started to use food pellets. Since then a number of my fishes have become infested with Anchor worm. I am enclosing a sample of the pellets for your examination as I am sure that they were the cause of the infestation. What do you think?

The pellets are not to blame for your trouble. Unless you had introduced something into the pond such as water plants or aquatic live foods, the infestation was caused by the introduction of the Koi. Anchor worm, *Lernaea cyprinacea*, is a crustacean and attaches itself to a fish and sucks its blood. Those found on a fish are females and have a bunch of eggs at their rear end. From these hatch tiny nauplii which swim around to find a host, and may live for a time in the gills of a fish. The parasites are very difficult to clear from a pond and all seen must be removed from fish. After a dab with neat T.C.P. they can be taken off with tweezers. To clear the pond of any more nauplii effectively, it would be necessary to empty the pond and allow it to dry out completely. All new fish added to a pond should spend some time in quarantine to ensure that they are free from pests and diseases. The life cycle of the *Lernaea* is described fully in my book, "Coldwater Fish-keeping", q.v.

What do I do with my garden pond if we get snow?

If your pond freezes over and snow falls on it, it is imperative that it is removed as soon as possible. Should a layer of snow remain on the ice for long the water may become foul and the fishes could be in danger. The snow should be removed as soon as possible either by sweeping it off or by flushing with water from a hose. Also a hole should be made in the ice to allow oxygen to enter. This is best done by standing a water can of boiling water on the ice; a hole will soon be formed and the can will be prevented from falling into the water by the spout and handle. Your pond is rather small and shallow and so the chances of freezing over will be great.

I have a tank of goldfish in an unheated room and am wondering how my goldfish will live through the winter. At what temperature should the water be kept at such times?

Goldfish can stand any temperature which is likely to be experienced in your room. The only trouble would be that if it became under freezing point and the water in the tank froze over there would be danger of the glass cracking, but I doubt very much if this would ever happen in your district.

I am thinking of making a fish house for the purpose of keeping and breeding fancy goldfish. Shall I insulate the walls and what is the best form of heating? I can run electricity or gas into the fish house.

As you are only going to keep coldwater fishes, you will need little warmth in the winter. Breeding fishes are usually better kept at a low temperature throughout the winter as they usually breed better after a cold spell. Electricity is the better heat to use as it is very easy to control. There should be no need to warm the whole house, but individual heaters can be in the tanks, controlled by thermostats. As long as the water in the tanks does not freeze over it will be all right as the only danger will be to the glass, not to the fishes. You will have to warm the tanks a little which contain the season's fry to keep them growing and one of 65°F., will be enough. Insulation is not essential for the house but it will help to restrict the use of electricity during the winter. A lining inside with hard board will make a lot of difference to the inside temperature.

I have bred thirty fantails this year and six of them are now swimming upside down. They are half an inch long.

I consider that you have not been using any form of artificial heating or the young fish would have been at least twice as large by now. To raise young fantails it is as well to use a water temperature of about 70°F. This will ensure that they are large enough by the winter to be able to survive well. Use an immersion heater with a thermostat. There will be no need to use aeration, as if the heater is placed low down in the tank, water will rise from above it to the surface and so become reoxygenated. Shallow water will also help on such cases.

In the summer I found that my water lily in the garden pond had floated up to the surface. What can I do to prevent this from happening again?

In any pond with no bottom soil, there is always the chance that when many leaves are on the surface, the whole plant will leave the bottom and float on top. When any plants are set in containers there must always be something to weigh them down. For a water lily a couple of pieces of broken paving stone and some large stones for the smaller containers will suffice.



TROPICAL Queries

by Dr. C. Andrews

I am frequently baffled by the vast array of frequently changing scientific names of fish. Is this really necessary, and can you help me understand the problem?

You are not alone in your confusion—although the business of scientific nomenclature is essential if scientists (and serious hobbyists) are to keep track of current thinking on the taxonomic relationships, evolution etc. of the many thousands of fish species that inhabit the earth's oceans, rivers and lakes. Certain species of fish have several common names—which is just as confusing! If we use the correct scientific name, at least we all know what we are talking about. I suggest you write to Mr. W. R. Dale, Federation of British Aquarist Societies, 14, Rutland Road, Wanstead E11 2DY. Ask for copies of their booklets on proper and common names of freshwater and marine fish (booklets 9 and 12) along with the booklet on scientific names and their meanings (booklet 10) total cost around £4.15 including post and packaging.

Several of the neon tetras which I bought recently have died. In each instance they went rather pale, and eventually the red stripe disappeared completely. My local pet shop told me this was "neon tetra disease," and I wondered if you could shed some light on this infection?

From the description you provided this certainly does sound like an out-break of "neon tetra disease." This disease is caused by an internal infection with a protozoan parasite called *Pleistophora*. Spores of this parasite lie within capsules in the host muscles and may cause the symptoms, and eventual losses, you described. The disease is probably passed from fish to fish, and other tetras (e.g. glowlights) may also be susceptible. As far as I am aware there is no chemical treatment for this disease. You should at least isolate any fish showing symptoms, and it is probably a good idea to painlessly destroy them. If you want to totally eradicate the parasite you will have to get rid of all your existing tetras (which may be carrying the infection), clean and disinfect the aquarium and all its equipment, and start again with uninfected fish. However, since it is practically impossible to guarantee tetras free from this disease, you will be better advised to maintain the soft, slightly acid conditions that most tetras prefer, feed a good, nutritious diet, and hope that the natural resistance of your fish does the rest.

At a local aquarist shop I bought some fish that were labelled "rice fish". Can you provide me with some information on the care of these fish?

The species of fish you refer to sounds rather like the Japanese medaka (*Oryzias latipes*). A relative of the killifish, the Japanese medaka may reach a length of 3cm. As its name suggests it originates from Japan (also China and Korea), and is quite easy to care for in the aquarium. They will quite easily survive at a (stable) room temperature, and have no special requirements regarding pH or water hardness. *Oryzias* are best kept in small shoals, and will be seen at their best with areas of open water between clumps of plants. They are extremely peaceful and will mix with other cool-water aquarium fish. The Japanese medaka can be maintained in good health on a mixed flaked diet, and it is quite possible to breed this interesting little egg layer in the aquarium. The female fish carries the fertilised eggs attached to her vent, and the young fry require very small live food.

Should I regularly add aquarium salt to my tropical freshwater aquarium?

In a freshwater aquarium, there are probably two main uses for salt. To begin with certain "freshwater" fish actually prefer brackish water conditions. Many live-bearers fall into this category, and if you specialise in these fish, you might like to try adding 1-2 tablespoons of aquarium (or cooking) salt to each 10 litres of water. This may be particularly beneficial if you live in a soft water area. In this context I should mention an excellent (and rather unique) little book: "Brackish Aquariums" by Gos (T.F.H. about £1.00).

The other main use for salt in the aquarium is as a "tonic" or disease remedy. The addition of 2-3 tablespoons of aquarium (or cooking) salt to a hospital tank is an excellent way to revive fish which are in poor condition because of rough handling, recent importation, fighting, etc. In markedly diseased fish, this dose rate may be increased to a total maximum of around 5-6 tablespoons over several days. The use of salt in conjunction with a proprietary brand of general fish tonic or tap water conditioner (e.g. *AquaSafe*) is also a good idea in these situations, since salt is not the universal "cure-all" it is sometimes said to be!

Can you send me some information on the water requirements of the chocolate gourami, and how can I get my specimens to accept flaked food?

The chocolate gourami (*Sphaerichthys ophromedoides*) is a relatively delicate species, and prefers soft, slightly acid conditions, with a water temperature around 25-30°C. It should be kept in a well planted tank, with quite subdued lighting.

This fish does seem to prefer live food, although you should be able to wean it onto a diet of dried foods. You could try starving your fish for a day or two and then offering them a dried food with a "life-like" shape (e.g. FD Bloodworms, dried *Tubifex*). Once you get them taking this, you should be able to persuade them to take flaked food.



PLANT Queries

by
Vivian De Thabrew

My son and myself have two tropical tanks which we have had about six months. The fish are all right, but my boy has had trouble just lately with his plants, which are slowly withering away. He did not put a layer of peat below the gravel, and I wonder if this may be the cause of the trouble with the plants. He uses a box filter, not an undergravel one.

The reasons for your plants dying off could be many. Many factors, such as lighting, heating, water condition, planting medium and water turbulence contribute to good plant growth. Therefore, as you do not tell me which conditions you have in your tank, it is very difficult to draw conclusions.

Gravel alone is not sufficient. Most plants require quantities of nutritious matter in the planting medium. Putting a layer of peat under the gravel will help overcome this deficiency, and will further help maintain the water in a slightly acidic condition. Therefore I suggest you do this and try to grow the plants by providing generally beneficial conditions, such as slightly acid, soft water, a temperature of 70°-76°F and fairly good light.

I am a new fishkeeper with a 100 litre aquarium which uses a 20 watt ultra violet fluorescent tube. The aquarium is equipped with an external filter, about 1½-2 in. sand, and a variety of rocks and pottery logs to give adequate cover for the fish. The water temperature is kept at 27°C, and the aquarium is situated in a position which receives diffused natural light. The ultra violet light is on for 14 hours a day. The aquarium is stocked with a variety of about 30 fish. The plant life consists of *Elodea densa*, *Cabomba*, Amazon Sword, *Acorus pusillus*, *Limnophila*, *Sagittaria* and *Vallisneria*.

My problem is that the plants do not seem to last very long, after a short while they turn brown (so do the rocks) and very soon what was once a fairly dense vegetation turns to half a dozen feeble-looking plants. The fish are fed about four times a day, and I have been using feeding rings to stop the food spreading and rotting the plants, but to no avail. Also, when changing the water (after treatment for white spot), I have noticed that the water is slightly yellow and has a smell. I am not too sure about the water conditions in this area, but perhaps it will help if I tell you that my kettle needs descaling frequently and it

is difficult to work up a soap lather, indications I think of hard water.

Incidentally, the Swordtails and Guppies have bred, so this will perhaps give you additional information about the conditions of the aquarium. I have also over the last six months had a few fish die with no apparent cause. Just occasionally a fish will become inactive, eat less or not at all, tend to remain still and just below the water surface, fins may or may not be pinched, and in time it either recovers or dies. Any idea as to what I could be doing wrong?

It appears to me that you have several serious problems hampering your plant growth. The fact that your water is slightly yellow and has a smell indicates that the filtration is not functioning properly. Most probably the water turnover is slow. It is brown algae which are turning your plants and rocks brown. This of course will, if unchecked, totally destroy your plants.

First of all let me say that you are giving too much light to your plants. Since you say that the tank receives diffused daylight, artificial lighting for about 10 hours per day with a 40 watt tube light is sufficient. This should, I think, reduce the incidence of algae. Concerning your planting medium, sand alone is not adequate for growing healthy plants. If you can, incorporate a layer of aquarium peat under the sand layer. You will then provide a nutritious tank bottom for the plants.

As you rightly determined, the water in your area appears to be hard. Most aquatic plants need slightly acid, soft to slightly hard water. If these conditions do not exist in your aquarium then the plants gradually die off. Apart from *Elodea densa*, all the other plants which you have mentioned prefer the slightly acidic, soft water condition. Therefore, incorporating some peat in the planting medium will certainly be a step in the right direction. If it is at all possible you should collect some rainwater, filter it in the tank. Rainwater is perhaps the best type of water which can be obtained without much difficulty or expense. Finally, you can reduce the temperature a few degrees to 24°C (75°-77°F).

I am very puzzled at the scientific names of aquarium plants. Though there are books about plants, they do not give any idea why these plants are so called. It would be very useful to us aquarists if you could explain whenever you can, how these plants got their names. Why are *Cryptocorynes* so called? We only know them as 'Crypts.'

I must agree with you that the Latin and Greek names of plants can be confusing to the hobbyist. In the very near future I shall write a short article explaining how plants are named and their significance.

The name *Cryptocoryne* is derived from two Greek words: *Kryptos*—hidden, and *Kroyne*—a club. This is a reference to the club-like spadix, i.e. the thick, fleshy spike with the flower or flower cluster being surrounded or enclosed (hidden) by the spathe, or tissue-like leaf-cover or sheath.



MARINE Queries

by Graham Cox

I am writing to you for some advice concerning mixing Butterflies and Angelfish. I am in the middle of setting up a 72 in. x 24 in. x 18 in. marine aquarium. I have been keeping Butterfly fishes for the past four years and been highly delighted and successful. I have decided to have a go at mixing Butterflies and Angelfishes together, having fallen head-over-heels for an angel called *Euxiphopops navarchus* that I spotted at my local shop.

My question is, will this angel make a suitable tank-mate for Butterflies and possibly a Powder Blue Surgeon and/or Regal Tang? Also is there any other angel that will live happily with the angel mentioned above? If so, what?

Euxiphopops navarchus, the Majestic Angelfish, is probably the second most difficult of the common angelfishes to culture in the small (—i.e. compared to a coral reef), home

"The most difficult to culture member of the larger angelfishes is undoubtedly the Regal Angel (*Pygoplites diacanthus*)"

sea aquarium. The most difficult species is undoubtedly *Pygoplites diacanthus*—the Regal Angelfish. However, having said that, your new tank is quite a decent size as home aquaria go and I would anticipate no great problems other than a little shyness for the first 2-4 weeks after adding the new Angelfish. Also, you musn't start fretting if this shy Angel doesn't appear to feed for the first 7 to 10 days

after adding it to the tank. This is quite normal behaviour for the species and provided that your water management/medication techniques are excellent, the fish will come out of hiding and begin feeding as soon as he's ready. The worst thing you could do during this first few days is to lose "your cool" and begin prodding and poking around the rocks and corals to see how's he's getting on!

As already stated, the Majestic Angelfish is probably the most shy and retiring of all the larger angelfishes, (Please don't write and tell me that your Majestic Angel puts in a full day's work on a building site and then comes home at six knocks the deuce out of his tank-mates until lights out! I'm talking here about the vast majority of Majestic Angels, which are very, very shy!), and would give no trouble to

"The worst thing you could do if you don't see your Majestic Angel around for a fortnight or so is to start prodding about in the rocks and corals to see how he is getting on".

most of the Butterflyfishes. In fact, the situation may well be reversed unless you're talking about buying a full adult Majestic Angelfish. In any event, I wouldn't advise you to put him alongside adult specimens of either—*Chaetodon vagabundus* or *C. pictus*. These two are very aggressive Butterflyfishes once they reach 4 in.—5 in. (10-13 cm.) in length—and they could easily do so in a tank as long as yours.

Any other angelfishes which you stock with your Majestic Angel should be from the dwarf and semi-dwarf genera, i.e. *Centropyge*, *Chaetodontopus*, *Geniactanthus*, etc., owing to the afore-mentioned timidity of the fish.

For similar reasons, I would strongly advise you against buying a Powder Blue Surgeonfish (*Acanthurus leucosternon*) unless you can obtain a juvenile specimen at, say, 2 in.—2½ in. (5-6 cms). Even then your Majestic Angel could be in severe trouble in five or six years time when the surgeonfish will be some 6 in.—8 in. long (15-20 cms.) and very nasty with it, even in a six foot tank. If I were you I would settle for a nice 2 in.—3 in. (5-7 cms.) Regal Tang (*Paracanthurus hepatus*) which would be a more even-tempered and more spectacularly coloured tank-mate.

OSCAR



G. Robinson

Commentary

by
ROY PINKS

LAST AUTUMN I wrote about the difficulty in obtaining Bitterling mussels, and after receiving considerable help from readers I managed to acquire some locally. One interesting letter I had, from Margaret Cairns of London, reported unusual enterprise on the part of certain vendors in Club Row (the section of the Petticoat Lane Sunday market which sells pets): here, so it seems, "bitterling kits" are on sale from time to time, viz pairs of these interesting little fish, complete with *Unio pictorum* (I hope!) mussels. It is a poor reflection on the greater part of the trade that it cannot rise to what is, after all, a very modest requirement that the two should be available together, but it does seem that, with the few exceptions I have publicised, most sellers of coldwater fish are content to fill their tanks with goldfish and koi of remarkably indifferent hardiness, with little else by way of variety. There was certainly far more enterprise in the '30s than there is today, despite all the difficulties there were in making a business pay. I suspect that in those distant days the big traders knew their fishkeeping through and through, whereas now their experience reaches little further than their cheque books.

The Right Mussel

One of the practical difficulties in setting up a bitterling breeding programme is the selection of the right type of mussel. It must, so far as I know, be *Unio pictorum*, or the Painter's Mussel. As the Swan Mussel (*Anodonta cygnea*) is perhaps equally available across the counter—though either seems about as common as gold dust—it would be useful to give a quick and easy guide to telling the one from the other. Reference to the immortal Furneaux work "Life in Ponds and Streams" is well worthwhile, and one gets a distinct feel for what is a difficult subject. Sadly, the most reliable pointer is that the former

has "teeth" in the form of interlocking features alongside the hinge connecting the two valves, and these can only be identified after dissection. In more general terms the *Unio* shell is thicker and more solid than that of the Swan mussel, which tends to be rounder than its elongated relative. Both are found in various localities in this country, in lakes, ponds and rivers. I wonder if readers have any more reliable external clues to positive identification?

Filter feeders

As mussels are filter feeders, taking water in via one siphon, extracting its suspended matter and finally expelling the residue through the exhalant siphon, their life span in the average tank is a matter for some conjecture. I well recall that my early days in the hobby were punctuated by regular fatalities on the part of mussels, which were then marketed as "fine scavengers and water purifiers", which qualities were all very well until their food supplies ran out, at which stage the side effects of their decomposition reduced my personal popularity to negligible proportions. Remembering this well, I made every effort to introduce my recent mussels to a tank containing murky water. After a day or so I left two in this tank and placed the other two in the small waterfall basin above my large pond, and so far there have been no casualties. I rather overfed the fish in the tank, so that there was usually plenty of mulm wafting around when there was more than average movement of the fish, and the mussels dug in and stayed put in much the same locations for several months. With the onset of winter I removed the two from the tank to the pond, where there is likely to be a lower level of metabolism during the winter, and where the creatures have a better chance of survival until food supplies in the form of microscopic suspended life become more plentiful with the arrival of warmer weather.

Improving survival prospects

What can be done to improve the prospects of survival of mussels in the average aquarium? Probably the most reliable means is the regular topping up of the tank with green rainwater, but as this will usually only be available during the summer, a winter régime as suggested above will have to be accepted. It is worth experimenting with materials like Liquifry No 2, which has a high vegetable content, and likewise very small quantities of some baby foods, the aim being to lightly cloud the water every 48 hours or so. Care must be taken to avoid polluting the water—it is better to underfeed than the reverse. I would also experiment with one of the foods marketed for marine invertebrates, as these are probably composed of a wide range of food materials, and are likely to be successful winter and summer alike. Most fishkeepers will probably find that an "on" and "off" season will be most convenient and cheap, but it must be remembered that if mussels are put outside, keep them in a pond or container from which they can be retrieved readily. If dropped into a pond casually it is unlikely that you will ever see them again.

Well-behaved mussels

Writers often put one off keeping mussels on the grounds that they plough up the tank floor. I certainly have vivid recollections of this, and my tanks resembled battlefields, but I cannot help but think that the movement of these molluscs could have a relationship with their satisfaction or otherwise with the food supply and the quality of the stratum. In the case of the mussels I now have, they have been remarkably well behaved, and though there has been some movement, the sand dunes have been levelled gradually by the fish, so there are two sides to the argument. Rooted plants would certainly suffer, excepting in the case of the more junior mussels, whose peregrinations would hardly be noticed. Hence, if you furnished a tank with substantial rock work or with cork bark, these would stand well. Plants could then be rooted in small flower pots hidden behind the bark, and if the food supply could be maintained as I have proposed, here at least would be one mollusc—and a very interesting one—to form a conversation piece in a decorative indoor tank. It would have none of the vices of the snails, which eat their way through everything, and could, if you have the right sort, act as maternity ward for your Bitterling. My next article will contain some further observations about this fish, including some recorded by Laurence Perkins in 1963 which opened up some fascinating speculation about its breeding habits. I hope there may be a shoal of letters on the matter by the end of the 1981 breeding season.

NEXT MONTH

How does a busy professional aquarist who is also a hobbyist find the time to cope with his own aquarium? By keeping maintenance as simple as possible says Dr. David Ford. He explains how in next month's principle colour feature.

Laurence E. Perkins turns the spotlight onto **EDIBLE FROGS**.

Karel Ratej writes about plants of the Genus *Sagittaria* and explains why some species are unsuitable for the aquarium and how to deal with those that are. A fully illustrated article.

Plus all our usual popular features.

**The Fishkeeping Magazine
which has something
for everyone**

Still **ONLY 60p.**

Order your copy NOW

Book Review

THE GOLDFISH by *George & F. Hervey & Jack Hem.*
Faber & Faber Ltd., £3.25

What can one possibly say about Messrs Hervey & Hem's book, 'The Goldfish' that has not already been said? Long recognised as a classic in the field of aquarium literature, when first published in 1948 it was hailed as 'a work of quite outstanding scholarship.' The subject matter was, to say the least, comprehensive. There were chapters covering such diverse subjects as anatomy, the various varieties of fancy goldfish, the ideal environment, history of the goldfish, breeding and showing, and a final chapter dealing with the goldfish in relation to the arts over the years. The whole was well illustrated by numerous photographic plates and many excellent line drawings by Mr. A. Fraser-Brunner, F.Z.S. I still thoroughly enjoy re-reading my copy from time to time, and it remains as interesting as ever.

A measure of the popularity of this work was the fact that Messrs Faber & Faber published a revised edition in 1968, followed by reprints in 1968 and 1974. This edition was reinforced by the inclusion of photographs by Mr. Laurence E. Perkins, (who is the present-day editor of this magazine), replacing some of the original illustrations which had been lost.

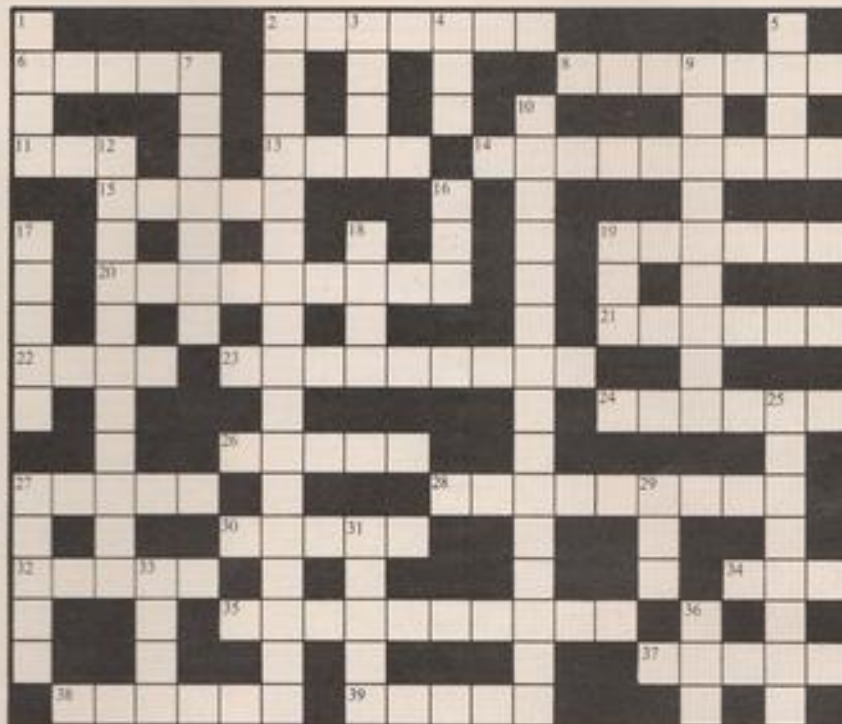
The publishers have now produced a paperback edition, with a total of 271 pages. Unfortunately, to my mind, all photographic plates have been omitted; however, the majority of the line drawings have been retained—50 in all. The publishers claim that this latest edition has been revised, but I found little evidence of this in the text. I feel that the authors should have been requested to write a preface to this edition, rather than to rely on the 1968 preface which refers to the photographs in that edition—but which do not appear in this. Also, the cover illustration could have been selected a little more carefully; a typical 'pet-shop' Oranda hardly does the book justice any more than its description as a "red lionhead veiltail goldfish"—but, as I am aware, publishers do not always consult the authors over the matter of the cover design.

Despite these criticisms, which are no doubt due to my having been spoiled by the first edition, it is, nevertheless, an excellent book that I can thoroughly recommend, at a price that puts it within the reach of most people. Those who, for whatever reason, do not have one of the hardback editions will find this modestly priced book a very worthy addition to their bookshelf.

Frank W. Orme

Crossword Puzzle

Compiled by Dave Roberts
Merseyside A.S.



Clues Across

2. This marine, could be described, as red (7)
6. One of the *Pterophyllum* species (5)
8. Common name for *Thayeria boehlkei* (7)
11. *Hypheosobricon* . . . a small characin (3)
13. *Aplocheilichthys* . . . easily bred killie (4)
14. Genus of S. American catfish (9)
15. Genus of catfish (5)
19. Colour of *Crenobrycon spilargenteus* (6)
20. *Xiphophorus hellerii* (9)
21. Kings of the Aquarium (6)
22. & 24. Common term for a shoal of *Hypheosobricon innesi* (4, 6)
23. Fish with distinctive black wedge (9)
24. See "22"
26. & 30. Common name for *Gymnocorymbus ternetzi* (5, 5)
27. "Sheepshead" is one (5)
28. Former name of *Pelvicachromis pulcher* (9)
30. See "26"
32. They extract oxygen from the water (5)
34. There is a black one, on the back of *Corydoras arcuatus* (3)
35. & 10. Down. A shoal of *Tanichthys albonotata* (5, 5, 8, 7)
37. *Lamprologus* . . . cichlid of L. Tanganyika (5)
38. *Hemigrammus caudovittatus*, . . . Aires tetra (6)
39. "Barriers" off Australia's coast (5)

Clues Down

1. Other name for pearl or mosaic gourami (4)
2. Beacons may be called this (4, 3, 4, 6)
3. *Barbus nigrofasciatus*, the black . . . barb (4)
4. Short term for white spot (3)
5. Catfish of sorubim species (4)
7. *Atyantus* . . . characin around 2 inches (7)
9. Common community fish (9)
10. See "35 Across"
12. *Rasbora trilineata* (11)
16. Moray is one (3)
17. . . . Danio, *Danio malabaricus* (5)
18. The caudal is one (4)
19. The Mediterranean for example (3)
25. *Aphyosemion* . . . a killie (8)
27. Species of scatophagus (5)
29. Sterilize it after use (3)
31. Aquatic creature, preying on fish (5)
33. A lateral one is usually found on most fish (4)
36. Number of spines on *Pangyrus pangyrus* (3)

Solutions on page 68



from Aquarists' Societies

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

SOUTH WEST



SLIDES and film on the subject of Koi were introduced to members of Bristol A.S. by Dave of its members. Mr Victor Cole described the breeding and rearing of Koi, using slides of his own and other local fish. Mr Q. Reed provided expert guidance through the many slides of the different varieties of Koi. A film made by Cliff Spence consisted of shots of Koi seen at recent shows.

SOUTH EAST



THE East Dulwich A.S. have enjoyed two interesting meetings recently. On 6th February Dave Winder gave an informative and interesting talk, with the aid of some very good slides on rare and unusual fish. A table show was held on 25th February and attracted 30 entries. Thanks to Mrs. Sylvia Brown for judging. Results: Goldfish: 1, Miss Samantha Hogan; 2, Dave Winder; 3, Barry Light; 4, Colin Hogan. Characins: 1, Dave Winder; 2, Colin Hogan; 3, Mick Powell; 4, Doris Winder. Killies: 1, Barry Light; 2, and 3 Mick Powell; 4, Ron Salmon. Meetings are held at Dulwich Baths Reception Hall, on 2nd and 4th Mondays of the month at 8.00 p.m. New members are always welcome. For further details and advice please phone Dave Winder on 01-699 3122.

THE Three Counties Group of A.S. are thinking of holding a fish festival in Reading in the late summer, which will basically be a full day of fishy talks and slide shows and a chance for the specialist societies to recruit new members—i.e., British Killifish Association, Catfish, Cichlids, Guppies, etc. They are also thinking of a quiz type competition involving winners of group quiz activities. This of course would be hard to arrange without support, so any group of clubs who would like to be involved in this new venture please contact Mr. Rod Norris, 17 Woodmire (Bracknell MK25) evenings, to try and sort out the best way of organising such a contest. The JC's Fish Festival has not yet been given a date or venue, but will be advertised as soon as possible.

Bethnal Green and Independent A.S. have had some interesting meetings during the first part of the year. Mr. Paul Mills, of Walthamstow A.S. gave a very informative talk on the art of designing and setting up a mini furnished tank for open shows, and hoped that in future more people will be entering this class at open shows. The first table show of the year was held, the results of which were: Guppies: 1, P. Riley; 2, B. Barber; 1, T. Riley; 3, A. Giffith; 1, A. Winder. A very interesting talk on keeping and breeding fancy goldfish was given by Derek Mills, of Ilford A.S., who illustrated his talk with a tankful of fancy goldfish he has bred. Other meetings included a slide show on tropical marine. Meetings are held on the second and fourth Tuesday of each month at Windsor Terrace School, East Ham, and new members are most welcome.

AT the a.g.m. of the East Dulwich A.S. held on 23rd March, the following officers were elected: Chairman, Ron Salmon; vice-chairman, Mick Powell; secretary, Dave Winder; 21 Edgeway Road, London SE18 2DE; treasurer, Barry Light; show secretary, Mrs. Doris Winder; librarian, Colin Hogan. Due to the many years of service that the retiring treasurer has given to the Club, Mr. Paul Crosswell was made an honorary member of the Society. The annual prizegiving was held on the same night and the results were as follows: Fish of the Year, A. mareo (95 pts.), Dave Winder; Highest Overall Points (2,963 pts.), Dave Winder; Runner-up Points (2,872 pts.), Mick Powell; Highest Pointed Fish, A. rubrolinea (87 pts.), Colin Hogan; Best Novice, Colin Hogan; Best Junior, Samantha Hogan; Best Barb, Doris Winder; Best Characin, Dave Winder; Best Cichlid, Barry Light; Best Anabantid, Mick Powell; Best Fishbowl, Dave Winder; Best Killie, Barry Light; Best A.O.V. Catfish, Doris Winder; Best Cory Brochin, Butch Woods; Best Rasbora, Doris Winder; Best Dario, Dave Winder; Best Loach, Dave Winder; Best Eggfish, Paul, Doris Winder; Best Livebearing Pair, Butch Woods; Best Molly, Mick Powell; Best Livebearer, Dave Winder; Best Goldfish, Samantha Hogan; Best Roseatee Team, Mick Powell; Best Pleco, Mick Powell. The East Dulwich A.S. meet on the 2nd and 4th Monday of the month at Dulwich Baths Reception Hall, Crystal Palace Road, London SE22. Meetings start at 8.00 p.m. and new members are always welcomed. Further details can be obtained from the Secretary (01-699 3122).

AT the Portsmouth A.S. a.g.m. the officers elected were: Chairman, Howard; assistant chairman, D. Forre; treasurer, Miss W. Ryder; assistant secretary, M. Woodhead; librarian, J. Sykes; assistant librarian, J. Handley; registrar and junior rep., D. Pearce; table show secretary, W. Ryder; social secretary, Mrs. J. Stowell; host; 1, Butch; exhibition manager, D. Forre; committee member, D. Bennetworth and P. Hooper; secretary, V. B. Hunt, "Cargill" 120 London Road, Witley, Nr Portsmouth, Hants PO7 5EW.

AT the third a.g.m. of the East Kent Aquatic Study Group, the retiring chairman thanked all members for their efforts in making 1980 a most successful year for the society. A great deal of participation and success having been achieved on the show bench. Special mention was made of Mr. A. Haslede for the work he did on the A.B.C. of Saltwaterkeeping tables, which took second place at the National Fishkeeping Exhibition. The news letter editor was congratulated on his monthly publication. The 1981 committee elected are: Secretary/treasurer, C. Bridgeman, 180 Green Hill Road, Harre Bay, Kent; chairman, J. Edwards, 14 Upper Dame Road, Margate, Kent; committee, J. Gilbert, R. Spoor, P. Seaby, N. Anon, A. Round. Meetings are held on the second Tuesday of each month at St. Bar's Church Hall, King Edward Avenue, Harre Bay, Kent. Novice and experienced fishkeepers and visitors are always made very welcome.

AT the March meeting of Mid-Sussex A.S. at Ockley Lodge, Keymer, members enjoyed a very interesting talk on Water Chemistry by Mr. C. Raggio, from Brighton. Results of table show: No-T: 1, Sharon Smith (Junior); 2, J. Smith; 3, E. and T. Tester; 4, P. Levine. No-M: 1 and 4, P. Levine; 2, B. Ferris; 3, P. Chalm. Meetings held on second Thursday each month at 8 o'clock at Ockley Lodge, Ockley Lane, Keymer. New and old members always welcome. Details from Secretary, J. Smith, 51 Eastbourne Road, Brighton BN2 4DC.

THE Wycombe March A.S. meet at 8 p.m. on alternate Mondays at the Social Club, Raille Ltd., Loudwater, High Wycombe, Bucks. At the a.g.m. the following officers were re-elected. Chairman, Johnny Jackson; treasurer, Mike Knight; social secretary, Ann Snape; publicity officer, Stephen Friend; secretary, Jeff Woodbridge, 16 Mount Pleasant, Lane End, High Wycombe. (Tel: High Wycombe 852875).

AT THE a.g.m. of the Mid-Sussex A.S. the previous year was summed up as being successful but quiet. Thanks were expressed to committee members and club members for all their support. Membership had maintained the same level as in the previous year, although some are new to the club. Hopefully they can increase this in the coming year. The following were elected onto the committee: chairman, Mr. W. Slade; vice-chairman, Mr. P. Levine; secretary, Mr. J. Smith, 51 Eastbourne Road, Brighton, Sussex (Tel: Brighton 602487); treasurer, Mr. W. Ferris; show secretary, Mr. T. Tester; committee, Messrs. L. Finney, S. Smith, N. Pollard and J. Daniels. Meetings are held on the second Thursday of each month at Ockley Lodge, Keymer, from 8 p.m. Anyone interested is welcome to come along. Further information from the secretary, Mr. John Smith.

Kingston and District A.S. began its year with the annual Presentation Dinner which took place on 8th January. This was well attended and all who went had a very enjoyable evening. The meetings which followed this on 15th January and 5th February comprised talks by Dave Mackay and Brian West on fishkeeping in general and by Cliff Harrison on various new items of aquarium equipment. On 19th February we held one of our most successful bring and buy. Dave Ellis conducted proceedings very well and bargains were had by all. The evening was in fact such a success that it has been decided a further bring and buy will be held on 17th September. As always Kingston Club welcome prospective new members or visitors. Meetings are held on the first and third Thursday of every month at the Raynes Park Methodist Church Hall, Worples Road, Raynes Park, S.W.20. Secretary Pat Lambert (01-542 9996).

BECAUSE of unforeseen circumstances, Reading and District A.S. have had to cancel the open show planned for 1981.

THE Harlow A.S. meet at 8 p.m. at the Potter Street Community Centre, Harlow, every other Wednesday. The April dates being 16, 15th, 29th, when livebearers, electric, will be discussed along with many other interesting topics. At the recent a.g.m. D. Hensman was elected chairman (White Roding 275) and M. Fowler as secretary (Godden 4443). New members will be made most welcome.

AFTER many years at the Ripple Road School Barking, the East London Aquarist and Pondkeepers Society, now meet at the Catterall Hall, Cecil Road, Chadwell Heath, Romford, Essex. They meet on the 1st and 3rd Thursday of each month. New members most welcome.

PHILIP SWINDELLS

Will the above named gentleman kindly contact the Editor of this magazine as soon as possible.

MIDLANDS AND WALES



Workshop Aquarist & Zoological Society open show results: **Guppies**: 1, Mr and Mrs. Foster (Worce); 2, Mr. and Mrs. Wall (Barnsley); 3, D. Barrett (B.C.C.). **Platies**: 1 and 3, W. H. Hodger (Loughborough); 2, Mr. and Mrs. M. Holland (Rotherham). **Mollies**: 1, D. Moody (Grimsby and Cleethorpe); 2, Mr. A. Marples (A and D); 3, P. Lane (Hallcroft). **Swordtails**: 1, D. Barrett; 2, Mr. and Mrs. Wall; 3, K. Hodger (Loughborough). **A.O.V. Livebearers**: 1, Mrs. D. Crickshank (C.A.G.B.); 2, Mr. N. Hancock (Hallcroft); 3, Mr. S. Dawn (Forest Town Show Society). **Small Barbs**: 1, Mr. A. Marples; 2, B. Banks (B.C.C.); 3, Mr. and Mrs. Farrow (Workshop). **Large Barbs**: 1 and 3, Mr. and Mrs. Kemp (Sheaf Valley); 2, R. M. Smithurst & Son (A & D). **Small Characins**: 1, M. Price (Castleford); 2, Mr. and Mrs. Colley (Ind); 3, Mr. and Mrs. Brackenbury (Ashby). **Large Characins**: 1, Mr. and Mrs. Stans (A & D); 2, R. M. Smithurst & Son; 3, M. Spinks (Ind). **Small Anabantids**: 1, T. Crickshank (C.A.G.B.); 2, R. M. Smithurst & Son; 3, Mr. and Mrs. A. E. Smith (B.C.C.). **Large Anabantids**: 1, Mr. and Mrs. F. Howell (A & D); 2, T. and J. Harrison (Rothwell); 3, M. Johnson (Forest Town Show Society). **Fighters**: 1, Mrs. B. Anderson (Ind); 2, Mr. and Mrs. Fawcett (York); 3, Mrs. Gray (Hill). **Dwarf Cichlids**: 1 and 2, M. Price; 3, Miss J. Lee (Chatterfield). **A.O.V. Cichlids**: 1 and 2, T. Stanfield (Leeds P.O.); 3, K. Fisher (Forest town S.S.). **East Valley Cichlids**: 1, M. Price; 2, M. A. Hellingworth (Forest Town S.S.); 3, Miss J. Lee (Oley). **Angels**: 1, R. M. Smithurst & Son; 2, Mr. and Mrs. Snowden (York); 3, H. Thorpe (Doncaster). **Pairs Egglayers**: 1, Mrs. Gray; 2, Mr. and Mrs. A. E. Smith; 3, B. Wigley (Matheringham). **Pairs Livebearers**: 1, M. Johnson (Forest Town S.S.); 2 and 3, D. Barrett. **Brooders Egglayers A & B**: 1, Mr. and Mrs. Moore (Cudworth); 2, B. Banks. **Brooders Egglayers C & D**: 1, D. Lacey (Fishkepers); 2, Mr. Lemm (Helson); 3, B. Banks. **Brooders Livebearers A & B**: 1, Mr. and Mrs. Wall; 2, B. Banks; 3, A. Cook (Hallcroft). **Brooders Livebearers C & D**: 1 and 2, B. Banks; 3, R. S. Cherrylolme (Cudworth). **Corydoras**: 1, Mr. A. Marples; 2, P. A. Hughes (Loughborough); 3, Mr. and Mrs. A. H. Smith. **A.O.V. Catfish**: 1, Mr. and Mrs. Sida (Barnsley); 2 and 3, Mr. and Mrs. Golland (Sheaf Valley). **Betta and Loaches**: 1, B. Banks; 2, Mr. and Mrs. F. Howell; 3, Mr. A. Cook. **Toothcarps**: 1, P. S. and A. Hopwood (Darwen); 2, Mr. and Mrs. A. E. Smith; 3, Mr. and Mrs. Silk (Sheaf Valley). **Minnows and Danios**: 1, Mr. and Mrs. Lake (Grimsby and Cleethorpe); 2 and 3, Mr. and Mrs. A. E. Smith. **Rabbits**: 1, Mr. and Mrs. Lake; 2, Mr. G. Marples (A & D); 3, Mr. M. Holland (Rotherham). **Sharks and Foxes**: 1, Mr. and Mrs. Kemp; 2, Mr. and Mrs. F. Howell (A & D); 3, Mr. and Mrs. Campbell (Ashby Fishkeepers). **Junior A.V.**: 1, Miss L. Wilson (Grimsby & Cleethorpe); 2, R. Stanfield (Leeds P.O.); 3, A. Palmer (Hallcroft). **Goldfish & Common**: 1, Sutton & Harris (Barnsley); 2, K. Chapman (Metheringham); 3, Mr. and Mrs. Silk. **Shubunkins & Fancy Goldfish**: 1, Sutton & Harris; 2 and 3, Mr. and Mrs. Silk. **A.O.V. Goldwater**: 1, B. Banks; 2, Sutton & Harris; 3, Mr. and Mrs. Snowden. **A.O.V. Tropical**: 1, Mr. Martin (Adlestree); 2, R. and S. Cherrylolme; 3, Mr. and Mrs. A. E. Smith. **Mini Jans**: 1, Mr. and Mrs. M. Holland; 2, and 3, G. Stoddard (Hallcroft). **Novels**: 1, 2 and 3, F. S. & A. Hopwood. **Best in show** was won by F. S. & A. Hopwood with a toothcarp.

CLAS meet regularly on the first and third Wednesday of every month at 7.30 in the Pupetra Club, Trefhogan, Mid-Glamorgan. Activities include table shows, raffles, slide lectures, and auctions of surplus fish. New members welcome (tel: 861681).

AT the 3rd March meeting of the **Canoeck & District A.S.** the following officers were elected: Secretary, Robert Potts, 25 Oaks Drive, Canoeck, Staffordshire WS11 1EU; chairman, H. Evans; treasurer, E. Smith; show secretary, J. Shaw;

assistant show secretary, A. Potts; librarian, J. Shorthouse; assistant librarian, R. Hall; committee members, D. Dunn, H. Smith, I. Souter, D. Hawkes and Mrs. M. E. Hall. New members are always welcome, and several special evening visits have been arranged for the future.

THE **Llanwit Major A.S.** meets in the leisure centre, Ham Lane, Llanwit Major on the 2nd Tuesday each month, at 7.30 p.m. A warm welcome is extended to visitors and new members. For any information contact the secretary, Mr. John Baker, 7 Blackbird Road, St. Athan, Barry CF69NL.

EAST



THE chairman of **Gt. Yarmouth and District A.S.**, Mr. Rodney Sterne, has regretfully had to resign due to a change in his employment. The committee and members would like to extend their thanks for all the work he has done for the society as chairman, and wish him good luck in his new job offshore. The reconstituted committee is as follows: Chairman, R. Andrews; vice-chairman, A. Kemp; treasurer, D. Lacey; secretary, A. Thorpe; assistant secretary, J. Durrant; show secretary, G. Dreyer; committee, Mrs. L. Durrant, A. Knight, K. Smith, Junior, Miss D. Thorpe.

NORTH



AT the a.g.m. of the **Northern Area Group of the Catfish Association of Great Britain**. The following officials were elected: Chairman, D. Sands; vice-chairman, G. Waterhouse; secretary, Mrs. M. Sands; treasurer, Mr. A. Waterhouse; F.R.O., J. T. Morris; show secretary, B. Baldwin; asst. secretary, Mr. R. Skotnick; lay members, J. Mead, D. J. Rimmer, N. Gerben. Results of the Pairs and Breeder's Group show: 1, corydoras uulnaria, Ian Fuller; 2, corydoras rubrae, Ian Fuller; 3, corydoras trilineatus, Bert Carter; 4, corydoras nanaus, J. T. Morris. **Brooders**: 1, corydoras barbatus, Ian Fuller; 2, corydoras garbei, Ian Fuller; 3, corydoras arcuatus, Ian Fuller; 4, corydoras seneca, D. Storr. Information about the group or the forthcoming Northern Catfish show or Catfish book, size guides, badges etc. may be obtained from the new northern area regional representative. Send s.a.s. to Mr. J. T. Morris, 102 Cale Lane, New Spring, Wigan, Lancs. WN2 1HB.

Wyke Show Society wishes to thank the Statesman League for accepting them as new members. At their last meeting, table event results were: Senior Tropical: 1, Mr. and Mrs. Bibby; 2, Mrs. C. Bibby; 3, N. Metcalf. Junior Tropical: 1, D. Buckley; 2, T. Gould; 3, R. Lovrick. **Tropical, A.O.V.**: 1, Mr. and Mrs. Ashdon. Meetings are held every 2nd and 4th Thursday in the month at "The Rose" Public House, Beverley Road, at 7.30 p.m. New members welcome. Enquiries to H. Bibby, 33 Yeaton Garth, Bessborough, Hull, or telephone A. Freely (445543) between 1.00 p.m. and 8.00 p.m.

RESULTS of the Kelghley A.S. show. **Guppies**:

1, Mr. and Mrs. Wall (Barnsley); 2, Mr. and Mrs. Fawcett (York); 3, F. Draycott (A & D). **Swordtails**: 1 and 3, Mr. and Mrs. Wright (Darfield); 2, Mr. and Mrs. Wall. **Mollies**: 1 and 3, M. and I. Crowther (Nelson); 2, F. Draycott. **Fishies**: 1 and 2, D. Scoble (Barnsley); 3, Mr. and Mrs. F. Howell (A & D). **A.O.V. Livebearers**: 1, I. Draycott; 2, Mr. and Mrs. Wall; 3, A. and E. Berry (Bridgewater). **Barbs-Roy**: barbs: 1, Miss J. Lee (Oley); 2, Mr. and Mrs. Wall; 3, P. S. and A. Hopwood (Darwen). **Barbs over Roy**: barbs: 1, Mr. and Mrs. Drury (Oley); 2, R. M. Smithurst & Son (A & D); 3, Mr. and Mrs. Sykes (Huddersfield). **Characins**: 1, Mr. and Mrs. Brackenbury (Ashby); 2, Miss J. Lee; 3, P. S. and A. Hopwood. **Characins over Bicolor Heart**: 1, R. M. Smithurst & Son; 2, R. Rouse (Sutton); 3, K. Gathorby (Bradford). **Rabbits**, **Danios**, **Minnows**: 1, E. Mottershead (Bradford); 2 and 3, F. S. and A. Hopwood. **Sharks and Flying Foxes**: 1, Mr. and Mrs. F. Howell; 2, C. Sutton (Cudworth); 3, T. and J. Harrison (Rothwell). **Fighters**: 1, Mr. and Mrs. J. Riley (Leeds P.O.); 2 and 3, Mr. and Mrs. Fawcett. **Fighters (Adults)**: 1, S. Anderson (Independent); 2 and 3, Mr. and Mrs. Brackenbury. **Anabantids**: 1, R. M. Smithurst & Son; 2, Mr. and Mrs. Lee (Rockingham); 3, Mrs. Anderson. **Anabantids over Thicklips**: 1, Mr. and Mrs. Howell; 2, T. and J. Harrison; 3, A. and E. Berry. **Toothcarps**: 1, D. Golland (Huddersfield); 2, R. Brown (Bradford); 3, Mr. and Mrs. Wright. **Angel Fish**: 1, Mr. and Mrs. Wright; 2, R. M. Smithurst & Son; 3, Mr. and Mrs. Snowden (York). **Dwarf Cichlids**: 1, L. Gathorby; 2, P. S. and A. Hopwood; 3, Mr. and Mrs. Fawcett. **Cichlids over Kribia**: 1, T. Stanfield (Independent); 2, K. Watson (Independent); 3, K. Adams (Chatterfield). **Corydoras**: 1, Miss J. Lee; 2 and 3, A. and E. Berry. **Loach, Botta**: 1, Mr. and Mrs. P. Howell; 2, P. S. and A. Hopwood; 3, Mr. and Mrs. Haddock (Sutton). **A.O.V. Catfish**: 1, Mr. and Mrs. Sida (Barnsley); 2, Mr. and Mrs. P. Howell; 3, T. Stanfield. **A.O.V. Tropical**: R. and S. Cherrylolme (Cudworth); 2, P. S. and A. Hopwood; 3, P. S. and A. Hopwood. **Brooders (Livebearers)**: 1, Mr. and Mrs. Wall; 2, R. and S. Cherrylolme; 3, D. Baker (Kelghley). **Brooders (11-20)**: 1, R. and S. Cherrylolme. **Brooders (Egglayers)** (1-10): 1, Mr. Brook (Huddersfield); 2, R. and E. Pearson (Kelghley). **Brooders (Egglayers)** (11-20): 1, Mr. Brook; 2, I. Oley (Dudworth); 3, Mr. Lemm (Helson). **Pairs (Livebearers)**: 1, A. and E. Berry; 2, Sutton and Harrison (Barnsley); 3, Mrs. A. Smith (Forest Town). **Pairs (Egglayers)**: 1, E. Mottershead; 2, J. Sheppard (Cudworth); 3, I. and E. Johnson (Leath). **Common Goldfish**: 1, Sutton and Harris; 2, Mr. and Mrs. Allard (A & D); 3, Mr. and Mrs. Silk (Sheaf Valley). **Fancy Goldfish**: 1, Mr. Brook; 2 and 3, Mr. and Mrs. Silk. **Shubunkins**: 1, Mr. and Mrs. Silk; 2, Sutton and Harris; 3, Mr. Brook. **A.O.V. Goldwater**: 1 and 3, Mr. and Mrs. Snowden; 2, A. and D. Berry (Bridgewater). **Juniors A.V.**: 1 and 2, Miss B. Smith (Forest Town); 3, R. Wall (Barnsley). **Juniors A.V. (Egglayers)**: 1, K. and C. Sida (Barnsley); 2, R. Wall; 3, M. and I. Crowther (Nelson). **Juniors A.V. (Goldwater)**: 1, D. and R. Draycott (A & D); 2, M. and I. Crowther. **A.V. Minnows**: 1 and 2, J. Sheppard (Cudworth). **Mini Jans**: 1, Mr. and Mrs. Howell; 2 and 3, Mr. and Mrs. Brackenbury (Ashby).

AT a meeting, hosted by the **Skalesydale & District A.S.**, representatives of the Skalesydale, Leigh and St. Helens Societies decided on a joint schedule to be used at the three societies inter-club shows. It was agreed that such a move would lead to fair competition between the clubs and simplify arrangements for future shows. The following classes agreed: **Guppies**, **Platies**, **Mollies**, **Swordtails**, **A.O.V. Livebearers**, **Small Anabantids**, **Large Anabantids**, **Fighters**, **Small Barbs**, **Large Barbs**, **Dwarf Cichlids**, **Large Cichlids**, **Rift Valley Cichlids**, **Angels** and **Danos**, **Small Characins**, **Large Characins**, **Tooth Carps**, **Rabbits**, **Danios** and **Minnows**, **Corydoras** and **Brochos**, **A.O.V. Tropical Fish**, **Sharks** and **Foxes**, **Loaches** and **Botta**, **A.O.V. Catfish**, **Pairs (Egglayers)**, **Pairs (Livebearers)**, **Brooders (Livebearers) C & D**, **Brooders (Livebearers) A & B**, **Brooders (Egglayers) C & D**, **Brooders (Egglayers) A & B**, **Common Goldfish**, **Fancy Goldfish**, **A.O.V. Goldwater**, **A.O.V. True Marine Fish**, **Junior (Egglayers)**, **Junior (Livebearers)**.

It was agreed that three trophies be awarded for Best Single fish, Best Pairs and Best Breeders. It must be acknowledged that the schedule produced is likely to lead to lively discussion in fish showing circuits but they believe they have adopted the fairest 'average' schedule, covering a wide range of interests and, please note, disposing with novelty jars, etc. They hope readers will give some thought to the notion of mutually agreed schedules and look forward to putting their joint venture into effect in the near future.

Wyke Show Society, had Mr. Roy Wilton president of the Hull Society as their guest speaker. He gave a very interesting talk and showed slides on the use of photographic equipment when taking aquatic photographs. Mr. Wilton also brought with him an excellent display of cameras and equipment. Table show results: A.V. seniors: 1, Mr. and Mrs. Bibby (W); 2, Mr. and Mrs. Ashton (H); 3, E. Ashton (W); 1, 2 and 3, Ray Laverick. F.O.N.: 1 and 2, D. Frisk.

Haylake A.S. held their a.g.m. on 19th March and officers and committee elected were: Chairman, G. Robinson; secretary, G. Robinson, 24 Hawthorn Road, Merton, Wirral, Merseyside L40 7UN. (Tel: 051-578 3843); treasurer, Mrs. S. Laking; show secretary, F. Edwards; committee, G. Ekin, D. Kelly, Mrs. S. Murray. The Society has moved to a new venue, the Arrowbrook Club, Moreton, and meets on alternative Wednesday evenings. Everybody is welcome with the unfortunate exception of under 14s—this is a rule of the club which the society is obliged to respect.

THE first show of the Statesman League of 1981 was held in Hull on 15th March. This league was first formed in 1974, and there are now six Societies taking part in this annual competition—Bridlington (B), Beverham (B), Hull (H), Scarborough (S), Wyke (W), York (Y). Hull were the host society for the evening, and there were a total of 244 fish entries, which were judged by the Beverham Society. Best Fish in Show award went to M. and P. Jordan, of Bridlington, with a Red Cocker Bury. Total points for the night were as follows: Bridlington (72 points); Hull (40); Scarborough (42); Wyke (30); York (20). Class results: Guppies: 1, Mr. and Mrs. Fawcett (Y); 2, Mrs. C. Bibby (W); 3, Mr. Standford (W). Swordtails: 1, Peter and Sylvia (B); 2, C. Taylor

(H); 3, M. and P. Jordan (B). A.O.V. Livebearers: 1 and 3, M. and P. Jordan (B); 2, Mr. and Mrs. Richardson (S). L. Barbs (over 70 cm.): 1 and 2, M. and P. Jordan (B); 3, Mr. and Mrs. R. Tooby (Y). L. Chalcids (over 7 cm.): 1, Miss J. Walker (S); 2, T. Gould (W); 3, Mr. and Mrs. Elcker (S). Platies: 1 and 2, Mr. and Mrs. Fawcett (Y); 3, M. Gray (B). A.O.V. Goldfish (over 10 cm.): 1, L. Taylor (B); 2, M. Gray (B); 3, Mr. Standford (W). Angels: 1, D. Agar and D. Cullen (B); 2, J. Casavan (H); 3, S. Spencer (B). L. Amantoids (over 10 cm.): 1, G. Nelson (H); 2, L. Casavan (H); 3, R. Gos (W). A.O.V. Goldfish: 1, R. Gos (W); 2, L. Taylor (B); 3, D. Gregory (S). Mollies: 1, Mr. and Mrs. Richardson (S); 2, Mr. and Mrs. Elcker (S); 3, G. A. Todd (H). Platies: 1, Miss S. Mansurath (S); 2, M. Gray (H); 3, W. Sowerby (S). S. Barbs (up to 10 cm.): 1, C. Taylor (H); 2, M. and P. Jordan (B); 3, Miss S. Mansurath (S). S. Chalcids (up to 7 cm.): 1, R. Laverick (W); 2, B. Talbot (B); 3, W. Sowerby (S). Koi-Dana-Mini: 1, R. McDonald (H); 2, G. Andrews (H); 3, Mrs. C. Bibby (W). A.O.V. Goldfish (up to 10 cm.): 1, S. Hoosen (S); 2, T. Gould (W); 3, Mr. and Mrs. Size (Y). Endemic Hill Lake Goldfish: 1, M. Gray (H); 2, N. C. Ferrand (B); 3, N. C. Ferrand (W). S. Acarabentials (up to 10 cm.): 1, M. Walker (H); 2, S. R. Wilson (H); 3, T. Gibbins (W). Corydoras and Brochis: 1, T. Smith (B); 2 and 3, K. Webb (S). Loaches: 1, P. and M. Richardson (Y); 2, Mr. and Mrs. Richardson (S); 3, J. and J. Douglas (H); 2, D. House (S); 3, Mr. and Mrs. Richardson (S). A.O.V. Tropical: 1, S. Spencer (B); 2, Mr. and Mrs. Ashton (W); 3, Mr. and Mrs. C. Bridge (B). Breeders (Egg-layers) (A & B): 1, Mr. and Mrs. Bolton (Y); 2, Mr. and Mrs. Richardson (S); 3, M. and P.

Jordan (B). Breeders (Livebearers) (A & B): 1, T. Smith (B); 2 and 3, M. and P. Jordan (B). Matched Pairs (Egg-layers): 1, G. Andrews (H); 2, M. Gray (H); 3, Mr. and Mrs. Tooby (Y). Common Goldfish and Comets: 1, Mr. and Mrs. Webb (S); 2, E. Ashton (W); 3, W. Sowerby (S). A.V. Female (Livebearer): 1, E. Hoosen (S); 2 and 3, M. and P. Jordan (B). A.O.V. Kallish: 1, Mr. and Mrs. Tindall (Y); 2, C. Vernon (W); 3, G. Andrews (H). Sharks and Foams: 1, Mr. and Mrs. Elcker (S); 2, T. Gould (W); 3, S. Spencer (B). Breeders (Egg-layers) (C & D): 1 and 2, Mr. and Mrs. Bolton (Y); 3, M. Gray (H). Breeders (Livebearers) (C & D): 1, G. Andrews (H); 2 and 3, T. Smith (B). Matched Pairs (Livebearers): 1 and 3, T. Smith (B); 2, M. and P. Jordan (B). Fancy Goldwater: 1, Mr. and Mrs. C. Bridge (B); 2 and 3, Mr. and Mrs. Slavin (S). A.V. Female (Egg-layers): 1, N. C. Ferrand (H); 2, G. Spiller (H); 3, S. R. Wilson (H).

THE Hull A.S. were the hosts for the first Statesman League meeting of 1981. Trevor Douglas, the Hull chairman, took the opportunity to welcome both the Wyke Show Society and Scarborough A.S. who were competing in the league for the first time. With 242 exhibits on the show bench, the judges from the Ebor A.S. had a difficult but enjoyable task selecting the eventual class winners. The final result was: Bridlington A.S. 73 points; Hull A.S. 46; Scarborough A.S. 43; Wyke Show Society 30; and York A.S. 24. Best fish in show award went to Mick Jordan. The Hull A.S. meet at the Hull Railway and Docks Club and Institute, Anshly Road, Hull, on the first and third Wednesday of each month. Visitors and new members welcome.

Dates for the diary

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

MAY

2nd May: Southend, Leigh & District A.S. open show. Schedule from J. London, 145 Whitmore Avenue, Stuffed Clays, Grays, Essex.

3rd May: British Koi Keepers Society a.g.m. at the Leicester Centre Hotel, 1 p.m. Membership Secretary: Mrs. C. Mullins, Woodlands, South Avenue, Langdon Hills, Basildon, Essex SS16 6JG.

3rd May: Hull A.S. open show at the Abernethy Youth Centre, Farnsway, Hull.

3rd May: Perfor & District A.S. 5th open show in the Reid Hall, Forth.

10th May: Throckley A.S. open show at the Grange Welfare Association, Newburn Road, Throckley. Benching 11.30-1.30 p.m. Judging 1.45 p.m. Details (a.s.p. please) from Show Secretary, Mrs. D. Laker, 51 Hewley Crescent, Throckley, Newcastle-on-Tyne NE15 9FX (Tel: 0632 677238).

10th May: Association of Midland Goldfish Keepers. Foleshill Community Centre, Coventry at 2.30 p.m. General meeting and table show of adult Fancy Goldfish.

10th May: The 3 Counties annual closed show will be held at Earthenpotend Community Centre, Rectory Lane, Bracknell. Show secretary, Peter Abbott, 24 Halswood, Bracknell. (Tel: Bracknell 55288) for information.

10th May: Leamington & District A.S. open and M.A.L. show. Benching 11.30am-1.30pm at Lillington Community Centre, Crown Way, Lillington, Royal Leamington Spa, Warwickshire.

10th May: Mansfield Aquarists Society open show. Details from Show Secretary, Mrs. P. Tomlinson, 14 Minor Avenue, Lyne Green, Sutton, Mansfield.

10th May: Port Talbot A.S. open show at the Talbot County Centre, Margam Road, Port Talbot, West Glam. Schedules early May from Show Secretary, A.L.S. Fouracre, 3 Cross Street, Velindre, Port Talbot, West Glamorgan SA13 1AZ.

10th May: Meeting of Southern Livebearers Aquatic Group, (Yorkshire Area Group) at Thorne Town Hall, Thorne, Nr. Doncaster (100 yards from Thorne traffic lights towards M. 15), at 7pm. Guest speaker Dave Cleeve, National Chairman of S.L.A.G. Table Show refreshments; and auction of pedigree livebearing stock. New members welcome. Further details from Yorkshire Group Secretary—Nairby Noble, 58 Woodville Road, Boston, Lincs. PE21 8AP (Tel. 0205-50438).

17th May: Corby and District A.S. open show to be held at the Festival Hall, Corby. Show schedules available from Ron Wilson, 33 Larrat Road, Weldon, Northants. (Corby 2848).

17th May: Midway A.S. Open Show at the Scout Hall, Turbury Avenue, Walderslade, Chatham, Kent. Full details from: Mr. G. Carpenter, 46 Temnyon Road, Gillingham, Kent (Phone 0694) 574424.

17th May: Bournemouth A.S. open show at Kinson Community Centre, Pelham Park, Kinson, Bournemouth. Details and schedules (a.s.p. please) from Jack Jeffery, 30 Brunner Avenue, Bournemouth BH16 4JF, Dorset after 1st April.

17th May: Stockton A.S. 16th annual open show at Corporation Hall, Stockton-on-Tees. Pre-entry forms can be obtained from the show secretary, Brian Clark, 55, Durham Road, Stockton-on-Tees, Cleveland, by sending stamped addressed envelope.

17th May: Accrington A.S. show at New Jerusalem School, Hargreaves Street, Accrington, opposite Police Station. (Change of date—not 14th June). Enquiries to J. Hilding, 146 Dewey Street, Accrington. (Tel: Acc'n 34204).

24th May: Bridlington & District A.S. open show, at Hilderthorpe Junior School, Shaftesbury Road, Bridlington. Details and schedules from Show Secretary, G. Spiller, 23 Westworth Road, Bridlington (Tel: 0262 60783).

24th May: Amble & District A.S. first open show. At the Boy's Club, Percy Street, Amble, Morpeth, Northumberland. Schedules from G. Hall, 28 Dawson Avenue, Felton, Morpeth, Northumberland. (Tel: Felton 611).

24th May: Portsmouth A.S. inter-club show at the Portsmouth Community Centre, Mallus Road, Buckland, Portsmouth.

24th May: Aberdeen A.S. open show at the Deaf Centre, Smithfield Road, Woodside Hill, Aberdeen.

26th May: Inaugural meeting of the Ichthyology Section, Northamptonshire Natural History Society and Field Club (established 1876), 7.45 p.m. for 8.00, at the Society's own premises, The Humfrey Rooms, Castellan Terrace, Northampton. Brief business meeting, followed by Mr. Alan Robinson, Northampton S.L.A.G., on "Freshwater Fishes of the World." All fishkeepers welcome. Further details from Northampton (0604) 38658 or 44258.

26th-31st May: Dublin Society of Aquarists joint open show with St. Pappas and the Sunrise Aquarists Society.

31st May: Redcar A.S. open show at Coatham Memorial Hall, Coatham Road, Redcar. Benching 12-2 p.m. Schedules from the secretary, D. Readman, 1 Lovat Avenue, Redcar, Cleveland TS10 5BS (Tel: 0642 474854).

31st May: Sutton and District A.S. first open show.

Solutions to crossword on page 65

Answers Across

2. Herring
6. Altum
8. Penguin
11. Eos
13. Dayi
14. Corydoras
15. Chaca
19. Silver
20. Swordtail
21. Angels
22. Neon
23. Harlequin
24. Tetras
26. Black
27. Acara
28. Kribensis
30. Widow
32. Gills
34. Arc
35. White Cloud
37. Meoli
38. Buenos

39. Reefs

Answers Down

1. Lace
2. Head and Tail Lights
3. Ruby
4. Ich
5. Lima
7. Mutator
9. Glowlight
10. Mountain Minnows
12. Scissortail
16. Eel
17. Giant
18. Tail
19. Sea
25. Australe
27. Argos
29. Net
31. Otter
33. Line
36. Ten

31st May: Mid-Sussex A.S. first open show, at the Sidney West Sports Centre, Leylands Road, Burgess Hill, W. Sussex. Information from Mr. T. Teater, 19 Cyprus Road, Burgess Hill, W. Sussex RH15 8DX (phone: 8 110 43802) or Mr. L. Pinney, 33 Burdock Drive, Burgess Hill, W. Sussex (phone: 8 110 44978).

31st May: North Avon A.S. 2nd open show in "The Hut" on the A38 (near "New Inn"), at Patchway, Bristol.

31st May: Sutton & District A.S. first open show at Sutton County Primary School, Sutton-in-Craven, Nr. Keighley. Information from Mrs. J. Haddock, 56 The Oval, Otley.

JUNE

7th June: Loughborough & District A.S. open show at Barleigh Community College, Thorpe Hill, Loughborough. Schedules (available March-April) from C. Taylor, 33 Shakespeare Street, Loughborough.

7th June: Whitley & District A.S. open show at the Spa Pavilion, Whitley. Details from Mrs. A. Forbes (secretary), 12 Lockton Road, Whitley.

7th June: Accrington & District A.S. open show at New Jerusalem School, Hargraves Street, Accrington (opposite Police Station). Further information from: J. Holdings, 146 Dewey Street, Accrington, Lancs. (Tel: Acc'n. 34204).

7th June: Otley A.S. 1st open show at Kirklands Menston. Benching 12 p.m. to 2 p.m. Auction, raffle, tombola, side-shows, refreshments. Schedules from 36 West Busk Lane, Otley, West Yorkshire.

7th June: Leigh A.S. open show. Secretary: E. N. Lawless, 9 Spruce Close, Lawson, Warrington, WA3 2DG. (Tel: 0942) 604077. Mr. Lawless is also the new secretary of the F.N.A.S.

14th June: Gt. Dunmow A.S. Open Show at Poulton Hall, Gt. Dunmow, Essex. Details from Mrs. P. Perry, 5 Randall Close, Gt. Dunmow, Essex.

14th June: Northwich & District A.S. open show at Hartford High School, Greenbank Lane, Chester Road, Northwich, Cheshire. Details from Show Secretary, D. Valentine, 43 Hartford Road, Davenham, Northwich, Cheshire. (Tel: Northwich 6624).

20th June: Nailsea & District A.S. eighth open show at Clivedon Community Centre. Show Secretary: P. Fitcham, 2 Woodland Road, Nailsea, Bristol (Tel: Nailsea 83396).

20th June: South Park Aquatic (Steady) Society Coldwater Fish, Tropical and Coldwater Plant open show at Wimbledon Community Centre, St. George's Road, Wimbledon, S.W.19. Schedules from show sec: E. A. Franklin, 105 Hanscock Road, London, S.W.16 (Tel: 91-879 2880).

26th June: Sherwood A.S. open show at the Lady Margaret's Hall, Holford.

JULY

3th July: Association of Midlands Goldfish Keepers. Sunday afternoon visit to a goldfish breeding establishment. Details of membership from Hon. Secretary, Miss G. Keigh, 6 Deansgate, Houghton-on-the-Hill, Leicestershire.

3th July: Chard & District A.S. 7th annual open show at Farnham School, Chard, Somerset. Details from E. K. Gray, 63 Henson Park, Chard, Somerset. (Tel: Chard 4272).

5th July: South East London A.S. open show at 141 Greenwich High Road, SE10. For information ring 838 8344 or 892 0283.

5th July: Kings Lynn A.S. open show at the Corn Exchange, Tuesday Market Place, Kings Lynn, Norfolk. Schedules from M. Lewis, Sun-Ray, West Witch Road, Kings Lynn (Tel: K.L. 87743).

5th July: Leamington & District A.S. open show at Liffington Community Centre, Crown Way, Liffington, Royal Leamington, Warwickshire. Benching 11.30-1.30 pm.

12th July: Scarborough & District A.S. open show at Oldshore Road Junior School, Wicker Street, Scarborough. Schedules from R. Stone, 9 Cliffon Street, Scarborough, N. Yorkshire (Tel: 0723 68088).

12th July: Mid-Sussex A.S. exhibition, at the Sidney West Sports Centre, Leylands Road, Burgess Hill, W. Sussex.

19th July: Sandgrounders A.S. open show at Meads Cop School, Meads Cop Road, Southampton. Schedules later from Mr. Baldwin, 18, Olive Grove, Southampton (0704) 43384.

19th July: Sandgrounders A.S. annual open show to be held in Meads Cop School, Meads Cop Road, Southampton. Further details from Mr. B. Baldwin, 18 Olive Grove, Southampton, Merseyside (Tel: 0704 43384).

AUGUST

2nd August: Ashby Fishkeepers Society first open show. Show Secretary: E. J. Lark, 23 Botherford Avenue, Ashby, Southsore, South Humberdale DN16 3EN (Tel: 62785).

2nd August: Leicester A.S. first open show at the St. Matthew's Community Centre, Malabar Road, Leicester. Details and schedules from Show Secretary D. Sewell, 37 Parkdale Road, Thurstonville, Leicester. (Tel: 495305).

8th August: Oldham & District A.S. open show at Werneth Park, Oldham. Information and schedules from A. Chadwick, 9 Brewin Close, Chadderton, Oldham (Tel: 061-652 6207).

15th August: Northern Goldfish and Pondkeepers Society 5th open show at the Sports Centre, Silverwell Tones, Bolton. Details and entry forms from D. Lord, 40 Hospital Road, Bromley Cross, Bolton.

23rd August: Nuneaton Aquarium Society open show revised date.

26th August: Nuneaton A.S. open show at Nuneaton Arts Centre, Pool Back Street, Nuneaton. Information from Show Secretary, G. Hemmings, 182 Tomkinson Road, Nuneaton, Warwickshire (Tel: 0692 325271).

26th August: Open show of fancy goldfish in Drumelfries. Organized by the Scottish Goldfish Group. Details and schedules from Tommy McLean, 36, Carron Park, Craigshill, Livingston, West Lothian, Scotland.

30th August: Castleford A.S. open show at the Woodhouse Hill Working Men's Club, Normanton. Schedules from Miss B. Stannil, secretary, 4 Alders Grove, Airedale, Castleford. (Tel: Castleford 559635).

30th August: Fleetwood & District A.S. open show.

30th August: Long Eaton A.S. sixth open show at the Gregory's Rose Gardens, Toton, Nottingham. Enquiries to R. West, Show Secretary. (Tel: Long Eaton 63023).

SEPTEMBER

6th September: Salisbury & D.A.S. annual open show to F.B.A.S. rules, at the Activity Centre, Wilton Road, Salisbury. Schedules from show Sec., D. Edleston, 13 Somerset Road, Salisbury, Wilt. (Tel: 0722-26219) S.A.E. please.

12th September: Hounslow & District A.S. open show at the Hounslow Youth Centre, Cecil Road, Hounslow. Information from Show Secretary, T. Bellingbrooke, 2 Holmwood Close, Addlestone, Surrey (Tel: Weybridge 54976).

May, 1981

WATERLIFE RESEARCH LTD.

SeAquariums

18 Forest Hill,
Portlancraith,
Monmouthshire.

Dear Sir,

Since using your "STERAZIN" and "SEAVITA," the Discus I had been having trouble with have ceased to scratch and twitch and are eating normally.

I use the "SEAVITA" solution to soak all my fish foods in (including live foods) for about 20 minutes before feeding.

Now my fishes are healthy and have taken on much brighter colours. I put this down to the usage of your products... which in my opinion are far superior to any other preparations I've tried.

Yours faithfully, W. Howard-Thomas.

"CUPRAZIN" - "PROTOZIN" - "STERAZIN" - "MYKAZIN" - NOT ONLY THE MOST EFFECTIVE DISEASE TREATMENTS - BUT THE BEST VALUE FOR MONEY. Each pack costs £1.32 inclusive of VAT and treats from 200 gallons up to 400 gallons.

Next time they push a foreign product at you, ask how much water it treats in British gallons.

BUY BRITISH - IT'S USUALLY BEST

NORTH AVON

Show Sec.
Mr. L. Lerway,
30 Fairford Close,
Little Stoke, Bristol.
Tel: 93-61286



2nd OPEN SHOW

AQUARIST

SUNDAY
31st MAY 1981

THE HUT
(Near New Inn)
PATCHWAY
ON A.38

OPEN TO PUBLIC 3p.m.