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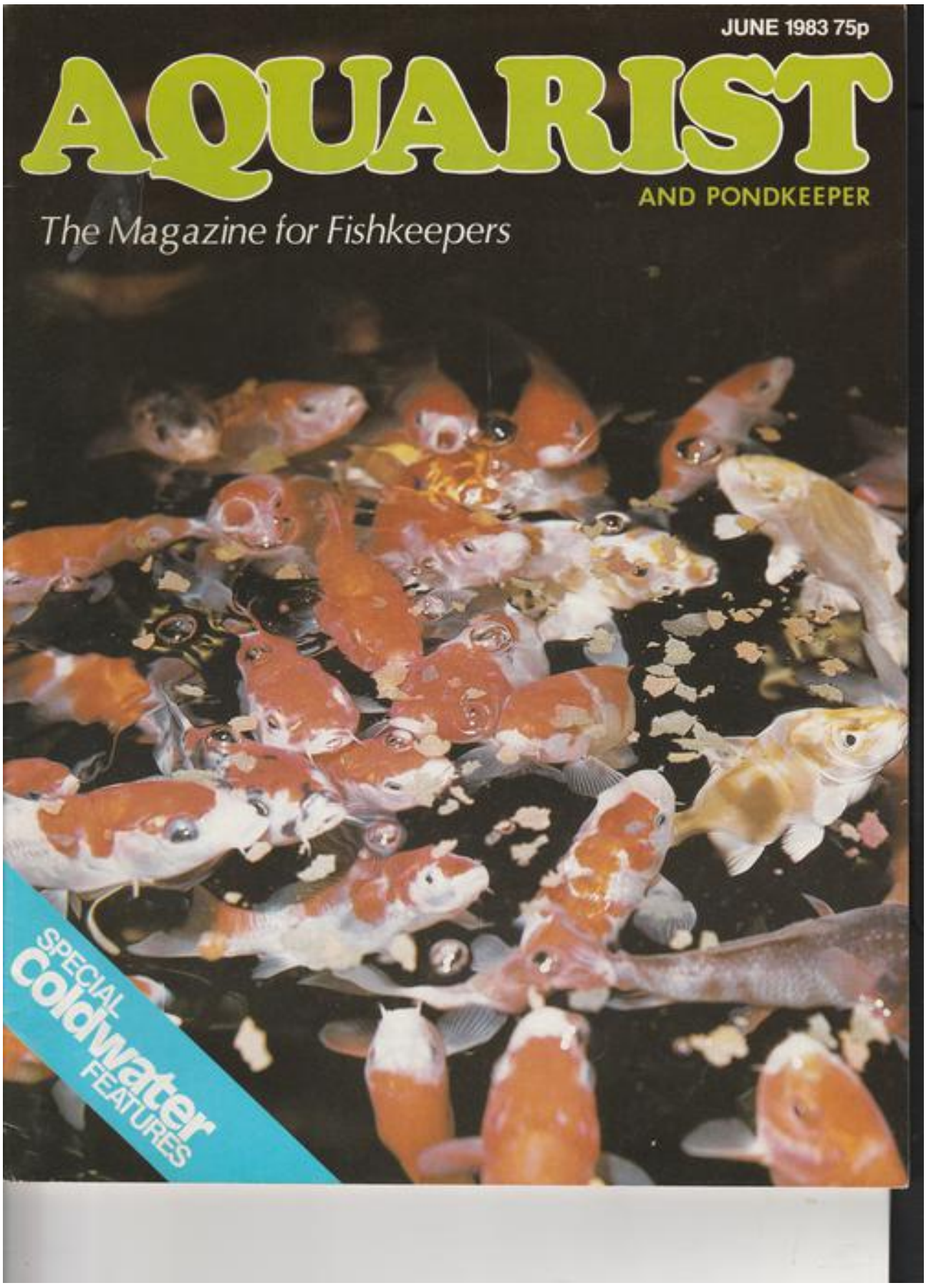
AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



SPECIAL Coldwater FEATURES

COVER STORY

Koi belong to the Cyprinidae which constitute the largest Family of fishes with about 275 genera and 1600 species. Among these are the genera *Carassius*, to which the Crucian Carp and all the Goldfish varieties belong, and *Cyprinus*, which includes, not just Koi, but also the Common Carp and its two most closely-related derivatives, the Mirror and Leather Carps.
The term Koi, itself, simply means Carp in Japanese and, although many people refer to all the domesticated forms by this name, it is more correct to use the term Nishikigoi in connection with the fancy varieties.
Carp have been kept in captivity for many centuries but the "modern" Koi that are available today are probably the descendants of stocks kept in rice paddies less than 100 years ago in some mountain regions of Japan. Therefore, the fantastic and bewildering colours and patterns that now exist have been developed in a relatively short time through intensive breeding of selected mutations (inheritable chance changes in the genetic make-up). Some of these selective programmes have resulted in individual Koi being valued at many thousands of pounds—even more than £200,000 in a few "extreme" cases. Fortunately for the aquarist, reasonable small specimens may be picked up from reputable dealers for the princely sum of £4 or £5.

CONTENTS

AQUARIST

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Your questions answered...

Having problems? Send your queries to our panel of experts who will be pleased to be of service. Every query receives a personal answer and, in addition, we will publish a selection of the most interesting questions and responses each month. Please indicate clearly on the top left hand corner of your envelope which department you wish your query to go to. All letters must be accompanied by a S.A.E. and addressed to:

Your Questions Answered, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN.

TROPICAL

Dr. C. Andrews

Tropical

water chemistry . . .

I am more than a little puzzled about pH and water hardness. Can you explain these to me and tell me how I can modify them in the aquarium?

The acidity/alkalinity of a solution is measured in terms of pH values from 1-14. Pure water has a pH of 7 and is said to be "neutral," while more "acid" water has a lower pH and more "alkaline" water a higher pH. Water hardness is related to the amounts of dissolved salts which are present. The general or total hardness (GH) consists of carbonate hardness (KH) plus non-carbonate hardness (NKH), and is expressed as °dH. When water has a general hardness of 4°dH or less, it is termed "soft" and contains little in the way of dissolved salts. The dH value increases with the hardness and at a general hardness of 30°dH or more, the water is considered "very hard" and contains large amounts of dissolved acids.

Most aquarists rely largely upon tap water to fill their tanks. The pH and hardness of tap water may vary from region to region. Whilst the pH is often neutral to slightly alkaline (pH 7·0-7·5), the hardness may differ considerably. Before setting up an aquarium or even a pond, it is a good idea for aquarists to check the pH and hardness of their tap water using a test kit available from their local aquarium shop. Depending upon the fish they wish to keep, it may be necessary to modify the pH and/or hardness.

Some tropical freshwater aquarium fish prefer soft, slightly acid water (general hardness around 5°dH or less, pH 5·5-6·5). Fish such as tetras, certain barbs, killifish, discus, etc. thrive under these conditions. Water may be made more acid by allowing it to stand in contact with aquarium peat for one or more weeks before use in the aquarium. Approximately two handfuls of peat (loosely tied in the leg of a pair of tights) should be added to every 10-15 litres (2-3 gallons) of water. This water should be tested to determine when the desired pH is reached. A pH of about 5·0 is the lower safe limit for most fish preferring more acidic conditions.

Hard water can be softened by dilution with clean rainwater, which is itself often quite acid. In industrial areas, the rainwater may be rather polluted, although this may be offset by collecting rain water in a continuously overflowing water butt. This often dilutes any pollutants that are present. Note that a piece of nylon net over the bottom of the drain pipe from the roof guttering is useful in preventing the entry of leaves and other debris.

African cichlids, like this *Melanochromis auratus*, prefer hardish, alkaline water

Tetras prefer soft, acid water

Aquarists will need to carry out one or two siting shots to determine how much rainwater to how much tap water is required to achieve the desired hardness. Of course, the process of softening and pH reduction may be carried out in one step by allowing peat to stand in contact with clean rainwater.

Certain aquarium fish (eg. Rift valley cichlids) require harder, more alkaline water (general hardness 10-15°dH, pH 7·5-8·0). These conditions may be created by allowing water to stand in contact with limestone bearing rocks or cockle shells, or even by the addition of sodium bicarbonate. (Limestone rocks may be detected by the addition of a drop of dilute acid (even vinegar)—if it foams it contains limestone). Water thus treated should be tested before it is used in the aquarium to check that the desired pH and hardness has been reached. Once again, aquarists will have to experiment a little to achieve the desired results. However, special salt mixes may be purchased to create ideal water conditions for rift valley cichlids, and, of course, water of the required pH and specific gravity for a marine tank is produced from one of the available seawater mixes.

C.A.

COLDWATER

Arthur Boarder

PLANTS

Vivian De Thabrew

KOI

Hilda Allen

MARINE

Richard Sankey

DISCUS

Eberhard Schulze

Coldwater

types of fantail . . .

Which fantails are the more suitable for the out-door pond, scaled or calico types?

The visibly scaled types are the better as the hard scales seem to enable them to stand the cold in winter and they are also a good protection against pests and diseases. The calico kinds are better for a tank as they have more attractive colours.

joining two ponds . . .

I have a concrete pond and intend to make another near it and would like to join the two by removing part of the wall of the old pond. What is the best way to connect the two ponds?

You can use a plastic liner to join the two ponds. It should be well sealed with a good sealant to avoid any leaks at the join.

size of tank . . .

I have been keeping tropicals for some time and now I would like to start with coldwater fishes. What is the minimum size for a goldfish tank, does it have to have a filter and which fancy goldfish are the best to keep?

I consider that a tank 24 × 12 × 12 inches is the best size for a beginner. I know that goldfish can be kept in smaller ones but from my experience the one suggested is very good. As long as the tank is not over-stocked with fishes there is no need to have a filter nor an aerator as long as enough water plants are added. I think that the Fantail goldfish is the best type for such a tank. They do not rush about like common goldfish and are more attractive and unusual. I may be biased about these fishes but having kept the scaled type and bred them for many years I have found that they are an ideal fish for the tank. The visibly scaled types are also very suitable for the outdoor pond. Do not have too many fishes in the tank, four three inch fish are adequate.

pond plants . . .

I am making a garden pond about 6 ft. × 4 ft. and 18 inches deep. How many water plants shall I need and which kinds?

I see no reason for including a number of different species of plants. What often happens is that if a number of kinds are used, in a short space of time, one may be very vigorous and choke out the others. One or two kinds are sufficient. I suggest you use a few clumps of *Lagarosiphon major* and *Egeria densa*. These used to be known under the Genera of *Elodea*. Another good one is Hornwort, *Ceratophyllum demersum*. This plant is very strange as it never makes any roots but seems to get its nourishment through the stems or leaves. This plant is ideal as a spawning medium as it can be placed,

Hornwort, *Ceratophyllum demersum*

with eggs, in a tank with no base compost and kept alive. You can have one of the small types of water lily. The type *pygmaea* will grow in a foot of water. Two good ones are: *Nymphaea pygmaea Alba* (white) and *N. helvola*, yellow.

A.B.

Koi

koi pond filter . . .

We write to you in a state of utter despair. Last year we made a Koi pond, it is 17 ft. × 10½ ft. × 3 ft. and holds about 2,800 gallons of water. We obtained a ¾ h.p. swimming pool pump and a filter to clear the green water, which it did for about three weeks when it again clouded.

By mid-March this year our pool is thick green and despite trying foam in the filter the water remains green. The filter costs at least £40 per quarter to run but we are unable to see our 16 Koi so frustration is but a mild description of our feelings. Any suggestions please?

I understand the various facts and figures given in your letter but it is difficult to arrive at any conclusions as I am not familiar with the filter you named and this, in conjunction with the ¾ h.p. water pump is perhaps where the problem exists.

If the filter is of a swimming pool type, usually supplied with a multi-port valve for backwash, rinse, etc., then it may only be presenting an effective filter area of between 2 to 3 square feet.

Such a filter is intended for use with a special sand media, in effect to remove the fine dirt settlement of rain, etc. Even if properly operated with the special sand, such a filter is in my opinion unlikely to mechanically filter out the amount of suspended algae that develops in Koi ponds. To pass 2,000 or more gallons of water per hour through a small quantity of sand, gravel, or even the best grade of reticulated foam rubber is, as you have already determined, a waste of effort and expensive electricity.

There should be no need to run a pump of this size and a cheap, both in capital and running costs, central heating pump providing about 800 gals./hour after friction losses, and turning over the pond volume once every 3 to 4 hours should keep the water clear PROVIDED the filter area, either as an under-gravel type within the pond, or external with several chambers, is equal to ¼ or ⅓ the pond surface area.

Only with this ratio of filter to pond and a relatively slow rate of flow through the filter, will there be any chance of building up a biological action to absorb and destroy the microscopic algae of "green water," at the same time as dealing with excess protein and nitrates from the waste products of the Koi, all of which encourage algae to flourish.

Biological filters must be run continuously throughout the year, and with a domestic central-heating pump with speed and output control, the maximum current is only 105 watts and may be used on a lower setting through the winter months.

But remember also that filters must be of an adequate size in relation to the size of pond and regular, partial water changes benefit the Koi.

Having used biological filtration for almost 14 years it is a long time since I worried about checking water quality, etc.

In any case, if there are any problems a change in the normal behaviour of the Koi would be the most certain indicator irrespective of analysis of the water.

Do not lose heart, most of us feel frustrated at some time. **H.A.**

Plants

'hairy bulbs' . . .

I recently bought two hairy bulbs with interesting leaves. I was told they were Aponogetons or something similar. I put them in the tank, water quite hard, lighting 3 ft. Grolux, temperature 80°F in about 2½-3 inches gravel over an undergravel filter, and used a well-known plant food. After about a week one of the bulbs went mad, leaves all over the show—they doubled in size in about two days, spear-shaped leaf, green with wine-coloured tinge, about 3 in.-4 in. long, 2 in-3 in wide and more coming. The second bulb appears to grow more slowly, having less leaves, which are bright green and a little like a Sword Plant, but crinkled edges.

An Aponogeton ulvaceus "bulb"

Would it be possible for you to do an article on bulbs and their likes, dislikes, etc., because if my second bulb carries on like the first I shall definitely go deeper into this attractive side of the hobby.

I am very pleased that you have got more interested in plant growing after seeing the growth of your bulbs. The bulb which 'went mad', producing the initial spear-shaped leaves is of the species *Nymphaea pubescens* (*stellata*). It eventually produces heart-shaped or round floating leaves. The other bulb which is producing bright green crinkly leaves is an *Aponogeton crispus* bulb.

There are many *Aponogeton* and *Nymphaea* species suitable for the aquarium. Most of these originate from Sri Lanka (Ceylon). They are extremely hardy, easy-to-grow plants. Several years ago I wrote some articles about a few of these species, but I have not written any article for the past three years. Instead I have concentrated on writing several books on aquarium plants. I shall certainly try to produce an article or two on the bulbs which you have mentioned. **V.T.**

Marine

breeding butterflies . . .

Having kept marines for many years, and the last three years, breeding, first the Tomato Clown and then the Common Clown. I now have about 100 Common Clowns ranging from 1 month to 4 months old.

I would very much like to try breeding Butterfly Fish, namely the Copperband or the Yellow Longnose. If it is possible to breed them in captivity, I would appreciate any information which might help me induce these fish to spawn:

1. Minimum tank size.

2. Any sexual differences if possible.

3. Do the fish spawn in pairs or in a shoal?

4. Preferred temperature and S.G.

5. Breeding times, eg. time of day, season, etc.

6. Any other information that you think might help me.

I am pleased to hear of yet another British marine aquarist successfully breeding and rearing Clown Fishes. Sadly enough the breeding of Butterfly Fishes is a considerably more complex task and I would suggest that you read the final paragraph in Martin Moe's book entitled Marine Aquarium Handbook—Beginner to Breeder. The main difficulties with Clown Fishes and Butterfly fishes is that first they generally lay much smaller eggs, which of course means the fry are considerably smaller and that the eggs are pelagic in that they float rather than adhere to a rock. However, there are some major breakthroughs being made in the United States, particularly by Martin Moe, and he is now successfully rearing the French Angel (*Pomacanthus paru*). Furthermore, to complicate matters, none of the Butterfly Fish or Angel Fish that have been reared have been tank spawned. Again

The Copperband Butterfly Fish, *Chelmon rostratus*

as Martin Moe's book describes, adult fish are selected from the ocean and hand stripped of their roe and milt, and then returned. The final complication with Butterfly Fishes is that they go through a number of fairly complex larval stages, so my advice to you would be not to look into trying to breed Butterfly Fishes, but first attempt some of the more exotic Blennies or Gobies, and then perhaps some of the highly coloured *Pseudocromis*, followed by one of the smaller Centropyges, either *C. argi* or *C. acanthops*.

R.S.

Discus

clown and discus tank . . .

After keeping fish for 2 years I am now thinking of getting a Clown Loach and Discus tank. The tank I have spare is a 48 in. × 12 in. × 15 in. all glass aquarium. The size of fish I am planning to get are three 3 in. Clown Loaches and five 1 in. Discus. As they grow and pair-off I will be selling the three 'worst' fish and keeping the best pair. Do you think this advisable?

As for filtration I have a Rena 305 internal power filter, I have an U/G filter as well—do you think I should use both types of filters?

All the fish shops I have been to in my area do not sell 1 in. Discus, could you please advise me on a dealer or breeder in my area where I can get the fish from?

What temperature would you recommend for Discus and Clown Loaches in an aquarium together?

Also, can you recommend a book on keeping Discus and what are the easiest type of Discus to keep and feed?

Clown Loaches and Discus fish usually go very well together; they make a very nice show and I am sure that you will have no problems at all but I would go for a Discus fish somewhat bigger than just 1 in. in size since the very young Discus fish often seem somewhat more troublesome, especially for a novice. Although a bigger Discus fish will cost somewhat more it often is money well spent. Once you have had some experience with the keeping of the Discus fish you can be more bold and try your hand with a smaller specimen.

As far as the selling of the three 'worst' one's are concerned I would advise you to keep them all since, what may seem the 'best' pair at the time does not always turn out to be a suitable pair. With five Discus fish you will be able to 'make' a pair in case your 'best' pair should prove to be unsuitable.

Since you have a power filter I see no point in using an U/G filter as well, but if you feel you must have a very good biological filtering system as well in your aquarium I would at least go for one of the new Oxydators which have been advertised in the magazine.

As far as a dealer or breeder is concerned I suggest that you write to all of the dealers or breeders who advertise in the *Aquarist & Pondkeeper* and ask for their price list and stock lists and I am sure that you will find someone able to fulfil your requirements.

The temperature of the water ought to be at least 85°F, the Discus fish and Clown Loaches will take this kind of temperature of the water and will be very happy. As a rule of thumb, the smaller the Discus fish, the higher the temperature and you will have less trouble. Baby Discus fish seem to do very well in a high temperature and I know of German breeders who will always keep their young Discus fish in a temperature of up to 92°F. A very good book which will give you all the information on the keeping and breeding of the Discus fish is: 'Discus,' by G. Keller, published by TFH at about £3·00.

All different types of Discus fish are either easy or difficult to keep, they will eat the same foods and will grow equally well as long as a good variety of foods are offered and many of the *Gamma* range of frozen foods are excellent. As their main diet, and this should be given at least once a day, there is nothing better than OXHEART, with a few drops of a vitamin complex added; frozen BLOODWORMS, frozen TUBIFEX, frozen LOBSTER EGGS, F/D TUBIFEX WORMS, TETRA CICHLID FLAKE, etc., etc. In fact I would suggest that you try ANY type of fare you feel they ought to have and you will find that Discus fish are not very finicky at all as was once thought. If Discus fish are kept in a reasonable environment and if they are fed at least 4 or 5 times a day they will grow very fast and within a year will become a 'show-piece' kind of specimen.

E.S.

WHAT IS YOUR OPINION?

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

Mr. G. F. Yallop wrote to me from Colemans, Launceston, Cornwall, and told me that as soon as goldfish became readily available again after the war he always had one in the inevitable bowl. Within a year or two he had graduated to a weird, home made and very non-standard aquarium. Mr. Yallop stuck with the goldfish until quite by chance he was taken to see an old fellow living a few miles away who kept fish in a couple of rambling glass houses heated with oil stoves. He said that he will never forget his first impression of a tropical fish house. The main thing, which he still enjoys, was the smell of flourishing plants in the warm, damp air. The tanks were pretty elderly, judging by the rust, but every tank was full of healthy plants, growing in crystal-clear water. He had no idea at the time that so many different types of fish existed—and he became hooked. He was invited to visit there as often as he wished. One day, soon after his first visit, the old chap gave Mr. Yallop a pair of white cloud mountain minnows, and explained that they could be kept in a reasonably warm room without additional heat. As it was summer time Mr. Yallop decided to put his new fish in his family's Anderson shelter down the garden and heat it with a small oil lamp. He hadn't the heart to get rid of the goldfish so he cut the sides and bottom out of a 7 lb. biscuit tin and glazed it. Everything in the tank died except for the *Cryptocoryne* and the minnows. He had yet to learn that *Vallisneria* and *Cabomba* don't exactly thrive in twilight. At about that time he went off for a week's holiday and left strict instructions on how the fish were to be fed during his absence. .

When he returned his Anderson-type fish shed was stone cold. He forgot to tell us that the shed was also his workshop and he had been preparing gunpowder and nitro cellulose, for 5th November, at the other end of the bench. His father had obviously discovered Mr. Yallop's small sister filling up the paraffin stove while it was still alight and surrounded by small tins of powder, etc. He thought it might blow up. Several months later it did—and made all the headlines. Fortunately Mr. Yallop had removed the fish by then; but the shelter was badly damaged.

Mr. Yallop was very annoyed about the minnows cooling off and cursed everyone for being so wicked to his fish. He was surprised to find that they were still alive and decided to take them indoors as he wasn't allowed to heat his shed. He started to sort out all the dead plants to begin again and was amazed to find nearly 100 babies sticking to the glass or swimming around. He can only assume that the dead plants had produced *infusoria* and helped the fry to thrive. He reared the minnows and took them to a large store and was very surprised to find that they were quite expensive. Many years later, when he had progressed to a quite large fish shed, he demonstrated many times to customers the simplest way of breeding white clouds. He would half fill a bucket with tap water, straight from the tap, and put in a pair of minnows. The bucket was placed on the floor of the shed, usually at about 68°F. Every night at lights out about a pint of cold water was poured in. If the fish were in good condition and the female roed up, the fish would spawn in 72 hours. The parents were not usually avid egg or fry eaters and plants were optional.

Mr. Yallop says that he has just restarted breeding fish after a lapse of 10 years and his main show tank is 7 ft. × 2 ft. × 15 in. with a 2 in. stainless frame. He has sorted out quite a number of vintage thermostats, etc., which still work well. He even has a couple of boxed new ones with 4s. 6d. on them (22½p)! The only packet of fish food not ruined by storage was a tub of Armitages Food Flakes; and Mr. Yallop's young son has raised a brood of guppies on it and they have grown well indeed.

Mr. William Bradbury's address is Isle of Skye Hotel, Dundee Road,

Killifish

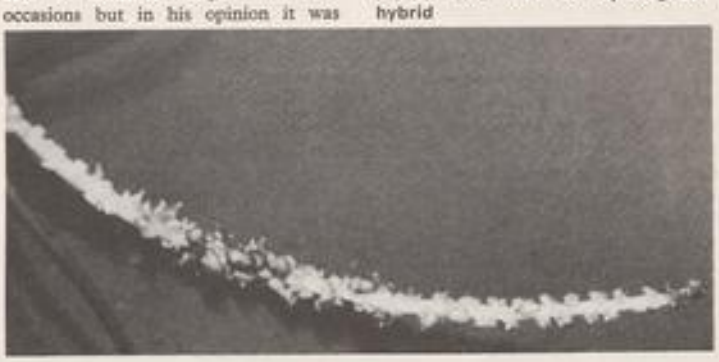
Otocinclus vittatus

Perth, Scotland, and he refers to my recent mention of my having contributed to *The Aquarist* for 19 years. He says that he cannot believe that it is so long, and that although he cannot recall my first article (February 1964—about aquarium snails) he can certainly remember the long period before I came on the scene—especially the dark days of the early fifties—and the Festival of Britain year when he was first attracted to our hobby. At that time Mr. Bradbury lived in a house without electricity and was obliged to warm his first aquarium with a paraffin heater. *The Aquarist* magazine then cost 1s. 6d. (7½p) and there seemed to be thousands of aquarist societies with novice fishkeepers clamouring for information. The cardinal tetra was then undiscovered and neons had never been bred in the British Isles. (I was still at primary school! B.W.)

Mr. Bradbury says aquarists struggled on with the usual zebras, white clouds, barbs and, of course, livebearers. He seems to remember that swordtails and platies were of extremely high standards, the red-eyed red or lutino sword being extremely popular. He says that as he was a beginner he may have over-estimated the merits of the fish but he certainly doesn't think much of the livebearers he sees nowadays. Also, he does not think there has been a great deal of advancement in the way of technical aids or cures. Fish still die of strange maladies and many people, including Mr. Bradbury, have problems cultivating aquatic plants. He remembers his first aquarium where the plants grew profusely; unfortunately so did the blanketweed as the tank was in front of a window facing south. The only significant advance in his opinion is the introduction of silicone sealer, which has done away with the necessity for angle-iron frames. They were certainly horrible, rusty contraptions, he considers; and he says that some glazing compounds were toxic. He lost a beautiful pair of lemon platies by putting them into a new-glazed 24 in. × 12 in. × 12 in. tank. He confirms that silicone sealer is a real boon to aquarists. (I must admit I still have a couple of rusty, angle-iron tanks in use—and they are messy. B.W.)

Mr. Bradbury moves on to cures and says that he cannot state, in all his experience, that he has cured a fish of any disease except white spot and velvet disease. At the moment he has a fighter suffering from finrot and although he has tried everything from antibiotics to cutting off the diseased part and dabbing with T.C.P. solution, the fish still refuses to respond to treatment. He may ask someone at his local society to have a go at curing it—if it survives until the next meeting. Recently he lost a spiny eel which seemed to exhibit symptoms of a fungus-type disease; however, he suspects it was something else—but does not know what. The fish was alive until he placed it in a 1 litre jar of mild salt solution; and after a while it just keeled over and died. He has known other spiny eels to contract fungus on other occasions but in his opinion it was always due to unsuitable gravel being used, e.g. sharp stones instead of pebble-like gravel. He sums up by saying: "Cures are a waste of time except in the case of white spot or velvet."

He has been trying to acquire suitable gravel for some time. As he is interested in a number of bottom-dwelling fish, such as *Corydoras*, he needs a substrate similar to the one he mentioned above. The nearest he can get is Dorset pea, which is smooth and round but just too big, any uneaten food just gets trapped between the particles; and worms such as *Tubifex* disappear in seconds, only to die and pollute the medium. He knows many authorities recommend 3/16 in. round gravel, but he wishes someone would tell him where he can get it. It seems to be unavailable where he lives; and he says that it would appear that some gravels are not free from lime or other such substances which can affect the water chemistry—although he knows some people who use oolite sand especially to harden the water for species such as swordtails and mollies. He says that a lot about water can be learned by asking one's local water board for an analysis of tap water—especially if one wishes to keep fish such as discus. Mr. Bradbury thinks that pH and nitrite should be tested regularly. He once bought 10 neons, put them into a community tank, and lost most of them over the next three days. Subsequently he tested the pH of the water in his own and



Flower and fruit of *Aponogeton* hybrid

in his dealer's tank and found that the dealer's water had a pH of 6·0, while his was pH 7·2.

Mr. Bradbury says he was a guest worker in the Federal Republic of Germany for six months. When he visited a variety of aquarium shops he discovered that only about one in 10 proprietoes understood English—so there was a language barrier. He discovered that German aquarists believe that power filters are essential in both marine and freshwater set-ups. The aquarium plants he saw were in marvellous condition—both those for sale and those in show tanks. The fishes were in perfect condition also. Prices varied, but he found very small neons on sale at 3p each. Mr. Bradbury says that German zoos are magnificent: he visited both Koln and Munchen Tierparken. After a couple of months he found himself forgetting the English names of some fish and he began to concentrate on their scientific names. He makes the point that such names are international.

I continue to get reasonably good value from the Woolworth's bulbs I use to illuminate my aquaria and grow my plants. The latest four to blow lasted: 115, 132, 139 and 169 days respectively.

I am still having problems with cardinal tetras. 10 that I bought were perfectly healthy for weeks—and then they suddenly began to die off, as previously. Seven of the 10 died; the three others, together with the proverbial four young pencilfish mentioned before, survived in excellent health. A couple of days ago teenage aquarist Robert Robinson telephoned me to tell me that a shop in Belfast had some good, young cardinals on sale at 55p each. Robert and his father kindly got 10 more cardinals for me and delivered them to my home the following day. They look well and appear to be healthy and happy in with the other three cardinals and the four pencilfish.

About two weeks ago two teenagers whom I did not know appeared at my door and asked if they could see my aquaria. I chatted with them for a couple of minutes and quickly discovered that I'd taught the elder brother of one of them. Gary Hodge and Stephen McCrindle are very keen, young aquarists and both had plenty of intelligent questions to ask and points to make about my fish, plants and aquaria. They left with a selection of fish foods remaining from the days when I reviewed such products for *The Aquarist*. If you have any spare foods, fish, plants or equipment that you don't need, do consider giving such items to local youngsters —especially if they are still at school, or unemployed. Once one has set up and stocked an aquarium it is inexpensive to maintain and feed the fish; young people who spend their free time looking after their aquaria are much less likely to vandalise the area in which they live.

***Ceratopteris thalictroides*—Indian fern**

This month's photographs show: (1) an attractive killifish; (2) a pair of *Otocinclus vittatus*; (3) a flower/fruit stem of an *Aponogeton* hybrid; and (4) Indian fern—*Ceratopteris thalictroides*. Please send me a few lines about any of these subjects.

I'll not pose any other topics this month because I already have a growing bundle of unused readers' letters and it would be unfair to solicit many more than I could use. Goodbye until next month.

COLDWATER PLANTS for the Aquarium

by Dr. W. Vivian De Thabrew

Egeria densa (Dense Pondweed)

1. Plants in the aquarium

Plants have a vital role to play in the aquarium: they condition the water by utilising the carbon dioxide, nitrogenous wastes and several other substances potentially harmful to fish and convert them to oxygen, which they distribute in the water; they are also directly beneficial to the fish in providing them with nutritious food and, in some cases, acting as a medicinal tonic: *Acorus calamus*, or Sweet Flag, for instance, has valuable medicinal properties; the plants also harbour food particles, algae and micro-organisms for the fish to graze on; further, they provide natural shelter for the fish. This is particularly important during the spawning period. Finally, they beautify the tank, while providing a natural setting for the fish.

2. Conditions needed for growth

(a) *Rooting medium, filtration and water condition*

The rooting medium is vital to the plants, as it provides them with a large proportion of their nutrition as well as firm anchorage, and conditions the water. Therefore a well-balanced medium is essential. One to suit most aquatic plants may consist of any of the following:

(i) Gravel: the fine or small 'pea' gravel
(ii) Coarse sand e.g. river sand

Myriophyllum spicatum (Spiked Water-Milfoil)

(iii) A mixture of clay with (i) or (ii)
(iv) A mixture of peat or leaf-mould or loam with (i) or (ii) or (iii)
(v) A mixture of peat or leaf-mould or loam with (i) or (ii) and (iii).

Whichever medium is chosen, it should be at least 3½ in. to 4 in. deep, to allow for good root development. Most species prefer slightly acid conditions, but for those few that prefer alkaline conditions, it is best to avoid using peat in the planting medium as this will make the water slightly acidic. Alkaline-loving plants need hard water and some calcium content, for example crushed shells, should be provided in the medium. Chalk may also be used to increase the calcium content, as may calciferous clay and rocks.

Filtration is not as vital for most plants as it is for fish. For many years there has been some controversy over the use of undergravel filters and their effect on plant growth. However, after years of experimentation with this method of filtration I have found that provided a sufficient depth of planting medium is used (3½ in.-4 in.) over the filter plates, excellent results may be achieved, as with bottom and outside filters. To prevent the filter-plates from becoming clogged when material such as peat, clay or leaf-mould are used in the medium, they may be covered with a fine gauze with about 1/16 ins. perforations. I have discovered that plants actually develop root-growth in such a manner that the water circulatory passages to the filter-plates have not been impeded, due to their very fibrous natures. The root-hairs flocculate the large particles around them, thus enabling free water filtration. Some plants require a certain amount of water turbulence, whereas others, such as Cabomba, only thrive in still waters.

(b) *Temperature*

Obviously no artificial heating is necessary for coldwater plants, which will tolerate quite a low temperature range, since they are native to Europe, North America and cooler parts of tropical Asia. Some of these species are also capable of tolerating much higher temperatures for limited periods, especially during summer e.g. *Limnobium spongia* (Tropical Frogbit), *Mentha aquatica* (Water-Mint), *Salvinia natans* (Water-Fern), *Myriophyllum* (Water-Milfoil), *Trapa natans* (Water-Chestnut) and many more. The majority of coldwater plants used in aquaria will grow comfortably in the unheated tank at room temperature.

(c) *Light*

Light is particularly vital in the process of photosynthesis, that is to say the process by which the manufacture of carbohydrates, the food matter of the plant, takes place. It is not always possible to give natural light to the plants, as this is governed by the position of the tank in the house, therefore artificial illumination should be provided, by tungsten type lamps or fluorescent tubes. The amount required depends on such factors as the size of the tank, the depth and clarity of the water, the extent of natural light available and the type of plants. However, as a rule of thumb, the light requirement of a typical tank e.g. 36 in. × 12 in. × 15 in., could be provided by two 30 watt tubes or two 30 watt tungsten bulbs on for eight to 10 hours per day.

3. Plant selection

Selecting plants is a difficult task for many an aquarist, confronted with plants of different shapes, colours and sizes from various parts of the world with puzzling names. It is wise to read a little about coldwater plants in order to have an idea what you wish to buy before you go to see what is available in the shops. In the summertime, of course, if time, weather and inclination permit, the keen aquarist may collect a few native species from the wild, giving him added satisfaction.

The plants under discussion may be divided into four major categories. The first, small group of plants useful for the coldwater aquarium, consists of floating ones. These plants float freely on the water-surface, with their fibrous roots growing just under the surface. They take their nutrients directly from the water.

Myriophyllum spicatum (Spiked Water-Milfoil)

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Callitriche palustris (Verna)—Vernal Water Starwort

finger, banking up the gravel around the base of the plant to anchor it firmly. Smaller, light-loving plants should be planted towards the front of the aquarium, taller plants at the sides, corner or back. Otherwise the location of the plants may be left to the artistic taste of the individual.

Aquatic plants may be propagated by stem-cuttings, root-division, runners or stolons, live-bearing plantlets or seeds.

Plants with tall stems bearing leaves on them are easily propagated by taking stem-cuttings. Such stem-cuttings should be cut to a length of about four to five inches (10 to 12 cms) and planted in the gravel. The leaves of the lower part of the stem which is buried in the gravel or sand should be removed, and about an inch (2½ cms) of the cutting buried in the medium. Pieces of stems, even if not anchored in the sand, produce roots in floating condition. These pieces, too, can be planted in the tank medium. *Apium inundatum*, *Alisma natans*, *Elatine hydropiper*, *Hygrophila polysperma*, *Ludwigia palustris*, *Lysimachia nummularia* and *Mentha aquatica* are good examples of species which propagate in this manner.

Propagation by root-division is usually possible with most water-lily species and plants with thick cylindrical or stout rootstock, such as Acorus. The rootstock should be cut with a sharp knife and separated, not torn off, as the damage thus caused would cause rotting. The piece or root cut off should be ideally dusted with charcoal dust or simply planted in a poor planting medium such as a coarse sand or a mixture of clay and coarse sand. This will enable it to root quickly. Once it has produced a shoot or two it can be planted in the tank. Most water-lilies are propagated in this manner. The point to remember is that once the root-cuttings have rooted and begun to sprout they should be kept in a moist medium and then planted in a container or tank, where the water-level can be increased very gradually over a period of time. Whether it be in the heated or unheated aquarium or the garden pool, this method of propagation is strongly advisable.

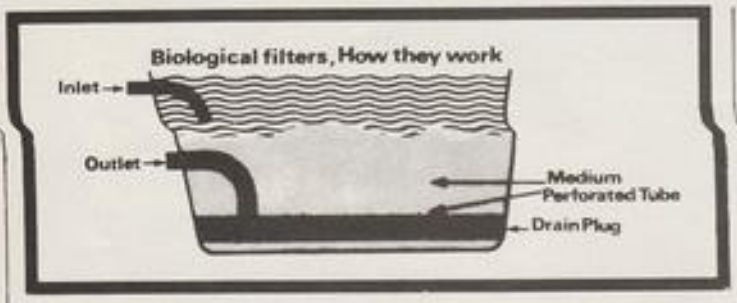
Propagation by runners or stolons is easy. The runners spreading from the main plants produce shoots or plantlets. These plantlets should be separated by using a sharp knife to cut the runner. These pieces of runners with their young plants attached to them should be planted in the same way as you would adult plants.

Some plants bear plantlets on their leaves. Examples of these are some of the water-lilies. The plantlets borne on the leaves are actual miniature replicas of the adult plants. These plantlets should be planted in sand or a sand-loam mixture and ket moist until they are established. Then these young plants should be gradually brought to a submerged condition. The length of time taken to fully submerge depends on the rate of growth of the plants. However, this can normally be achieved within a month of planting the tiny plants.

Propagation by seed is not of common occurrence in the aquarium. Nevertheless, there are some species which will only propagate by seeds. The seeds should be sown in a shallow container, like a seed-tray or dish, filled with a mixture of loam and sand. The water-level of this container should be not more than an inch. As the seeds germinate and grow, the water-level should be increased.

In the foregoing paragraphs I have attempted to give the reader the briefest understanding of the nature and culture of plants suitable for growing in cold-water. However, anyone wishing to gain a deeper knowledge of the subject is recommended to consult the following: Arber, Agnes, *Water plants*. New York: Wheldon & Wesley, 1963; Bursche, Eva M., *A handbook of water plants*. London: Warne, 1971; De Thabrew, W. Vivian, *Coldwater aquarium plants*. Cheltenham: Thornhill Press, 1983; De Wit, H. C. D., *Aquarium plants*. London: Blandford, 1964; Stodola, Jiri, *Encyclopaedia of water plants*. New Jersey: T.F.H., 1967.

Press Release



System 25 & 50 Biological Pond Filters

NEW from Aqua 83, the System 25 and System 50 free flow filters.

New generation biological filters using the latest research and technology allied to new methods of construction giving high performance at a very economical price. We believe these are the best value for money filters currently on the market.

The theory behind the biological filter is becoming better known, it does have some similarities with the traditional mechanical type but whereas water is passed through the traditional mechanical type under pressure and filtered through mediums such as filter wool, sand, gravel, etc, the medium in a biological filter has a very different purpose, it acts as an anchor on which aerobic bacteria culture can flourish. This will then consume any harmful nitrates from the pond water which passes through it, converting fish waste, etc, back into non-harmful inert substances.

Water passing through a biological filter has a much higher oxygen saturation level than the traditional mechanical filter and this makes for a healthier pond, in turn allowing for more fish to be kept. An easy way to start bacteriological growth is to place a small dead fish in the filter.

Biological filters still collect solid debris which needs to be washed from the filter from time to time. This however is an easy operation and full instructions are available on this, installation and basic maintenance.

The System 25 is a 25 gallon capacity filter which will service a 400 to 800 gallon pool.

The System 50 is a 50 gallon filter and this will service a pool of 800 to 1,200 gallon capacity.

Each filter treats 200 gallons of water per hour and if additional capacity is required to treat larger pools then more than one filter can be used in combination.

Aqua 83 have gone back to the drawing board as far as constructional methods are concerned. Both System 25 and 50 could be called basic filters, to put it simply all the complicated bits have been taken out, still allowing for high performance but reducing maintenance to the minimum making them ideal for enthusiast and professional alike.

Tetra Information Service

MANY readers will be aware that the Tetra Information Centre has now installed a 24 hour answering service to deal with urgent aquatic queries. The telephone number is Leeds (0532) 555980. Readers are requested to note the following points:

1. The answering service is intended for urgent enquiries and more routine requests for literature, etc. should be made in writing to the address below.

2. From time to time (as a result of a bad connection?) only an incomplete message is recorded by the machine. Therefore if hobbyists using this service do not receive a reply within a few days, they are advised to call again.

3. Queries can be dealt with most efficiently if a home telephone number is provided, where the hobbyist can be reached during the evening. It is also a good idea to leave an address as well, in case telephone contact proves difficult to achieve.

Tetra Information Centre,
15 Newlay Lane Place,
Leeds LS13 2BB.
Yorkshire.

David Ford back in the UK

DR. DAVID FORD, the well known aquarist who developed the Aquarian range of fish foods has returned with his family to the U.K. after spending nearly two years in Spain.

Dr. Ford developed a range of pet foods for the Spanish firm Efem Espana, a sister Company of Thomas's of Halifax.

The Aquarian laboratory has been transferred from the Animal Studies Centre in Leicestershire to Thomas's, manufacturers of the Aquarian range, and Dr. Ford has taken over as head of this 'Aqualab' to work on the development of new products.

The Aquarian brand has grown rapidly since its launch in 1976 and Dr. Ford's expertise as a scientist and aquarist will further strengthen the Aquarian Advisory Service.

PRESS RELEASE

New Garden Pump brochure from PLS Products

PLS Products Ltd., P.O. Box 114, Croydon, have produced a new full colour brochure on their range of garden and leisure pumps. Both submersible and portable surface types are covered with details of performance, specification, size and application data. Copies are available on request.

King British launch OTP

KING BRITISH Aquarium Accessories Company has announced the launch of a unique new aquarium water purification device which is assured to enhance water quality and create a healthier environment for fish and plants.

Called OTP—short for 'overhead trickle purification', the new King British system, which retails at £12·95p, is designed to fit most aquariums on the market. It incorporates a splash and trickle action, which diverts water onto a sedimentary rock bed. This helps to produce a natural, biological process thereby increasing oxygen levels and removing killer gases like carbon dioxide.

Such has been the impact of the new King British OTP system, that at the recent British Pet Industry Exhibition at Harrogate, it received the three top awards at the trade show. OTP was voted the best overall new product, the best new aquatic product and the best packaged product.

In essence King British OTP allows a greater concentration of fish more comfortably. It is the most cost effective way of meeting oxygen requirements, induces greater oxygen retention in the water, improves the discharge of carbon dioxide and precipitates out unwanted mineral excesses.

The system has been developed in the King British Research and Development Laboratory and has successfully undergone trials in the company's own major aquarium.

The OTP process draws water through a simple pre-filter and is fed to a trickle tank some three inches above the water surface. The water passes over a course and onto a bed of special porous sedimentary rock material, dispersing harmful gases and picking up oxygen on the way. The lava has been selected to propagate nitrifying bacteria on its entire surface. The water trickles through the bed slowly, allowing the bacteria access to free atmospheric oxygen. The trickling water falls back on the aquarium surface, creating a simulated rain shower, and releasing unwanted gases on the surface water. The result is high quality aquarium water and, most important of all, happier, sparkling fish.

Keith Barraclough, the chairman of King British said: "This is one of the most exciting advances in water purification in the last 30 years. The system is totally complementary to the normal filtration systems." He added: "What we have done is to develop a system of water purification for the hobbyist which, in effect, duplicates some of the processes which take place in nature."

Leaflets and further information on the OTP system can be obtained from King British Aquarium Accessories Company Limited, Hayfield Mills, Haycliffe Lane, Bradford, Yorks.

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

Sera Pond Aids

THE natural regulation of water quality is inadequate for most ornamental and garden ponds. Water must be treated and for this purpose the following products have been created.

Aquapond

This product softens mains water, which is harmful to fish and plants. It reduces the chlorine effect, binds dissolved metallic salts and neutralises other harmful and toxic substances such as acid rain, exhaust gas, etc.

Aquapond contains colloids which protect the sensitive mucous membrane of fish. It improves and stabilises the pH value. Good water quality encourages a 'flourishing water garden' particularly if, with the aid of *Pond Morenaclear* the water is simultaneously treated biologically.

Pond Morenaclear

Regular application of *Pond Morenaclear* inhibits the growth of green algae which are detrimental to ornamental carp and prevents the growth of toxic blue algae and fungus. The light filtering property (amber colours) of this biological product keeps the water germ-free in a natural way. Growing young are thereby protected against harmful bacterial attack. Germ-free water in this case also means clear water.

Florisan T.

A preparation containing selected minerals which particularly promote water lily flowers and lets them bloom longer. Young sets of Canadian soldier weed (fast growing), watercress, crowfoot, reed and bullrush, irish, marsh marigold and the like can make headway against the ever present algae

Continued on page 47

by Roy Pinks

IT is not very clear where, in the table of things to do, aquarium and pond keeping actually figure. Is this activity an art or a craft—or neither? A hobby, certainly, but not a pastime, which latter suggests that life is so intolerable that the sooner we get rid of it all, the better. This rather unclassified state of affairs is the very sort of thing that comes from an activity that is totally disorganized and aimless and which is generally in the hands of those who are not even intelligent enough to be altruistic when it would really pay them to be. What future is there for such a collection of self seeking individualists on both sides of the counter? Indeed, one could go even further and add the division that exists as between those in societies and clubs and those who go it alone. All seem to amble on, year after year, with no very clearly defined aims, getting nowhere very slowly.

I have suggested in a recent Commentary that some unifying influence is called for in the trade, but the challenge seems quite beyond the wit or ability of today's entrepreneurs—perhaps they are too elderly to put much thought to the matter. Equally, so diverse as to purpose are the national societies—certainly they are very vague—that little cheer may be expected from this direction either. In fact, so huffy do they get at the merest hint of criticism that at times it does seem that the hobby speaks with at least a dozen voices, most of them at odds with the others.

Assuming all this to be so, it may well be asked what might be done about it with the object of bringing about greater prosperity within the hobby and a longer lasting membership on the part of its practitioners. It must be remembered that there is a very large floating population (pun not altogether unintended) which simply ought not to drift away. The fact that it does is worrying because those who defect usually have an axe to grind, the word gets round and it is bad for all. Those who are about to join are put off and those just a bit fed up just give up. In such a well established hobby as gardening or darts this just doesn't happen. I wonder why? Whilst I am no expert on the latter, at least I can state that in the case of horticulture there are enough proven craftsmen practising and writing for hobbyists to have confidence in. They have found their way to the top not just by owning a flower shop but by undertaking a long and demanding apprenticeship which enables them, when qualified, to speak their minds about trees and plants and appliances without fear or favour. Most of them have passed the stage where prize tickets meant anything—they have reached positions of wider vision. In fishkeeping the unifying unit at present is the local society. Good ones can exert considerable influence, and even bad ones, with some injection of purpose, can work wonders. But don't far too many of these concentrate on the fish/prize ticket relationship to the exclusion of the factor which really matters, namely the aquarist? In the long term the societies have to think up every sort of device from table top competitions to those disgusting car treasure hunts to retain a working membership: thus, what ought to be a sort of craft union simply turns out to be yet another social club where the exhibits might well all die from the tobacco smoke!

I would suggest that what is really needed is the sponsorship from a respected and affluent source of a graded diploma of aquaculture, to be run and supervised by approved local societies and awarded to students who successfully completed the course. I don't suggest those phoney certificates awarded to those who successfully answer 732 answers from a self-teaching course priced at £75 in two hours flat. Something like a two year job with lots of practical and theoretical study is more to the point, possibly sandwiched between suitable sessions at the local technical college. It is all a bit removed from the monthly line up of those well fed fish which regularly win the red cards, but can anyone really justify competitions as they at present exist, apart from those for breeders and furnished aquaria?

This is perhaps a bit radical, and I have a fair idea of the few responsible practitioners who are likely to support it. Whether it has any chance of catching on is in the lap of those with the means to further it.

How much better if this enterprise had been channelled to greater purpose! If we had the thread of a two year diploma to bind the societies, the members and the trade, I would guess that attendances at meetings would greatly improve. I have had comments from many defectors that they gave up going to meetings because there was nothing to talk about excepting the ineptness of the judges: this does indeed pall. But a more positive and creative aim would soon get the debate going about genes and pH as well as guppys. Then we might all look a lot more respectable.

The Scottish Aquarist Festival-1983

THE Motherwell Civic Centre was once more the venue for the Scottish Aquarist Festival, just as it has been since the inception of this annual event eleven years ago. Again, just as in the past, the organisers, and all others associated with the Festival, offered us a weekend of total enjoyment and excellent hospitality. To them, we extend our most sincere thanks—their efforts were appreciated by thousands, as the attendance figures and the brisk trade in fish, food, plants, accessories and books testified.

Judging of the 500 or so entries took place on Friday and the Festival itself was opened to the general public on Saturday and Sunday. It was gratifying to see so many family parties coming to view the exhibits provided by the Societies that took part in this year's event. Some of these Societies had travelled great distances, coming from as far south as Basingstoke. Other well-known "faces" among the twenty Societies that entered tableaux were the Catfish Association of Great Britain and Workington A.S. Making a welcome reappearance were Stanley A.S., who had previously shown some four years ago, and new "faces" included Grampian A.S., Dunbar A.S. and Lakelands A.S.

Judging tableaux has always been a long, time-consuming process requiring a great deal of thought and discussion. In order to relieve the Festival judges of this burden, the S.A.F. Committee departed from past practice and enlisted the services of two independent persons with the professional skills required for the task. These were Mr. James Paterson, an architect by profession, and Mr. Richard O'Grady, the Director of Calder Park Zoo. Each tableau was judged on five points:—originality, cleanliness, construction, display of exhibits and safety. The competition turned out to be a very closely run affair with only four points separating the top five places. The winners of the Tetra Min Trophy were Dalkeith A.S. with their scaled-up model of a CB Radio, closely followed by the Scottish A.S. with their Space Rocket. Third place went to Paisley A.S. for their fishy stamp album, cleverly called "Fishately".

1983 is the 25th anniversary of the Federation of Scottish Aquarist Societies and the S.A.F. Committee decided to mark the occasion with a special feature at this year's Festival. This was an invitation to Dr. Isaac Isbrucker from Amsterdam University to give two lectures on the Saturday afternoon. He kindly accepted the invitation and, in fact, went a stage further by offering to give a third lecture on the Sunday when he heard that his departure back to Amsterdam had been delayed by a change in flight times. The lectures touched on a wide range of fish, including North Sea herring and South American Characins, but the main theme was South American Catfish. His knowledge of these fish is nothing short of amazing and any serious aquarist finding him/herself within travelling distance of an Isbrucker lecture would be well-advised to attend. After the lectures, Dr. Isbrucker, who gave his services free of charge and did much to cement relations between the Dutch and British aquarist, was presented with an Edinburgh Crystal decanter and whisky glasses. There was a picture of Edinburgh Castle and the S.A.F. logo inscribed on the decanter.

In addition to the 500 entries referred to above, there were about 200 entries in the Aquatic Art Section reserved for Schools (see 'Tomorrow's Aquarist in this issue of *A & P* for further details). The Individual Entry was won by Sean Finally, Abronhill Nursery School won the best Class Entry, and Cambusnethan Primary School the Best Furnished Aquarium Section.

The tone of the 1982 S.A.F. (referred to as the 'Year of the Cats') was taken a stage further this year, not only by the inclusion of Dr. Isbrucker's Catfish lectures, but by the award of the top prize, the Best Fish in Show, to a splendid *Corydoras sychri* owned by Jim Makin (Stirling A.S.) who also collected the Best Breeders (Egglayers) trophy with his *Corydoras ornatus*. Jim won two further trophies, the Hartlepool Trophy for the Best Loach and the Mark Aitken Trophy for the Best Catfish 'A'.

Other trophy winners were:—
'Aquarist Trophy' for Tableau with Highest Point: Dunfermline A.S.; N.E.L. Trophy for Society Furnished Aquarium: Aberdeen A.S.; F.N.A.S. Trophy for Individual Furnished Aquarium: Dunfermline A.S.; Edinburgh Pondkeepers Trophy for Best Coldwater Fish: J. O'Sullivan, Dalkeith A.S.; George Henderson Trophy for Best Livebearer: M. Strange, Basingstoke A.S.; Aquarama Trophy for Best Livebearers (Pairs): M. Strange, Basingstoke A.S.; Stan Taylor Trophy for Best Barb: D. Cruikshank, Catfish Assn. G.B.; Woodcock Trophy for Best Characin: P. Moye, Basingstoke A.S.; Bob Ferguson Trophy for Best Rasbora: T. Cruikshank, Catfish Assn. G.B.; Friendship Trophy for Best Danio or Tropical Minnow: J. Wells, Dunfermline A.S.; Belle Vue Trophy for Best Siamese Fighter: B. Hetherington, Dunfermline A.S.; Muirhouse Trophy for Best Gourami: P. Moye, Basingstoke A.S.; Rift Valley Trophy for Best Old World Cichlid: P. Moye, Basingstoke A.S.; Fotheringham Trophy for Best New World or Small Cichlid: J. Fettes, Aberdeen A.S.; Lanarkshire Trophy for Best Breeders (Livebearers): M. Strange, Basingstoke A.S.; M. & M. Trophy for Best Pair of Egglayers (not classed elsewhere): D. Long and

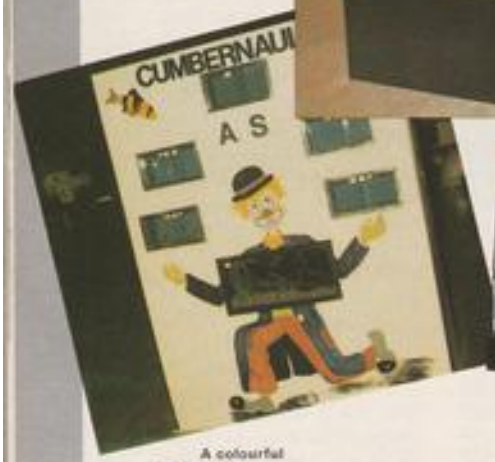
This 'CB Radio' won first prize for Dalkeith A.S.

The Scottish A.S. were over the moon when their 'Space Rocket' came second in the Tableaux section!

A stamp album entitled 'Fishately' claimed third place for Paisley A.S.

Miss Sadie Sinclair, wife of the F.S.A.S. President, presenting Derek Long of Dunfermline A.S. with 'The Aquarist' trophy for the Tableau which produced the highest number of points overall

'The Old Woman who lived in a shoe' as portrayed by Aberdeen A.S.



A colourful tableau from Cumbernauld A.S.

A section of the Schools Art Competition

K. Johnston, Dunfermline A.S.; Earl of Motherwell Trophy for Best Guppy: H. J. Adair, Workington A.S.; Aberdeen Trophy for Best O.A.S. Egglayer: D. Strachan, Aberdeen A.S.; B.K.A. Trophy for Best Egglaying Toothcarp: A. Waddell, Muirhouse A.S.; Hutchings Trophy for Best Pair of Guppies: J. Wells, Dunfermline A.S.; Ayrshire Trophy for Best Catfish 'B': T. Cruikshank, Catfish Assn. G.B.; Aquarian Trophy for Best Shark: S. Hamilton, Paisley A.S.; Duncan Fotheringham Trophy for Best Aquarium Plant: S. Naismith, Lanarkshire A.S.; Basingstoke Friendship Trophy for Best Swordtail: D. and N. McFarlane, Stirling A.S.

Goldfish in colour

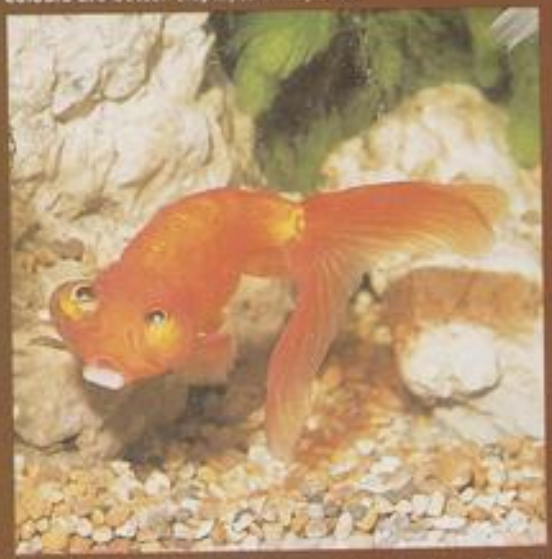
Some popular varieties

The Common Goldfish—most popular and ideal fish for the garden pond

Bristol type Shubunkin. Suitable for ponds but its colours are better displayed in aquaria

Metallic-scaled Fantail. Hardy and robust, suited to both aquaria and ponds

The Lionhead. A fancy variety lacking dorsal fin and best suited to aquaria



Celestial Goldfish. Bred originally for pond stocking from where its eyes regarded the observer

Bubble-eye Goldfish. A grotesque variety with eye-sacs quite unsuited to the rough and tumble of pond life

KOI SHOWS IN BRITAIN

by Hilda Allen

THERE can be little doubt that Koi-keeping is a very popular hobby or that people are becoming more adept in successfully managing them. This is reflected in the better quality of fish to be seen at Koi Shows held throughout Britain.

The first all-Koi Open Show was held in 1975 at Bury in Lancashire, and organised by the Northern Section of The British Koi-Keepers' Society. It attracted 42 entries including some from as far afield as Cornwall, Essex and Buckinghamshire, and cost in the region of £65 to stage. The show vats lined with blue polythene sheeting were of 3 ft., 3½ ft. and 4 ft. diameter as Koi are intended to be viewed from above and are not shown in tanks.

This modest beginning was the forerunner of the impressive displays now seen annually in many parts of the country with hundreds of entries and thousands of people attending.

Subsequent B.K.K.S. National Open Koi Shows have been held in the Botanical Gardens, Birmingham, the beautiful grounds of Tatton Park near Knutsford in Cheshire, and the attractive surrounds of Bressingham Gardens in Norfolk.

At KOI '82 held in June of last year, there was a very high standard of entries and more classes were opened to cater for new varieties. Koi that could easily have been champions in earlier years had to give way to some of the superb specimens now available in this country particularly in the large to almost jumbo size groups.

Even the smallest Koi have a fair chance of winning a first prize trophy or a rosette and certificate award, as all fish are graded and judged according to both size and variety whether of the more basic types such as Kohaku, Sanke, Bekko, Ohgon, Shusui and so on, or any other metallic or matt variations generally referred to as Hikari-Mono and Kawari-Mono.

The British Koi-Keepers' Society National Open Show KOI '83, is being held on Sunday 26th June, at Billing Aquadrome, Little Billing near Northampton. Local Shows by Sections of the B.K.K.S. are also planned and to date these are being held on Sunday 15th May at Badgers Mount near Orpington, Kent; Sunday 17th July at Gregory's Rose Garden, Stapleford, Notts; Sunday 7th August at Waveney Fish Farm, Diss, Norfolk; Sunday 21st August at A.S.S. Water Gardens, Grays, Essex; and Sunday 4th September in the Northern area, venue to be announced later.

The Yorkshire Koi Society annual Open Show will be held on Bank Holiday Monday, 29th August in the grounds of Harewood House, near Leeds.

Koi Shows are spectacular events of great interest and value not only to the enthusiast, but also to the public at large by providing an opportunity to see many wonderful Koi in all sizes and colours as well as to learn a little about these enchanting fish.

Some of the prizewinners at The British Koi-Keepers' Society National Open Show, KOI '82

The proud owner and the Grand Champion, a golden Ohgon

Best Tancho Kohaku

Best Hariwake Ohgon, Doitsu

Showa Sanke

Gin-Rin Kohaku, silver scaled

Taisho Sanke, best in Dealers' section

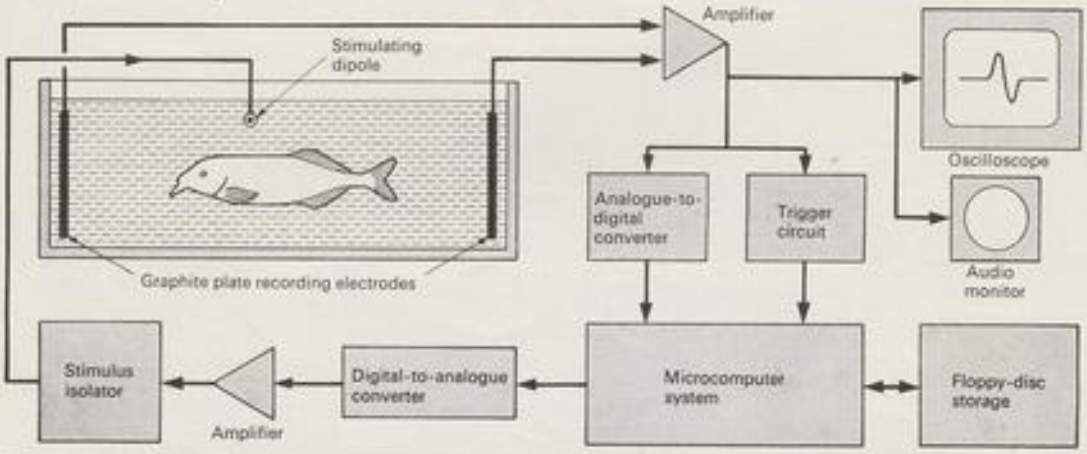
by Eric Hardy

ALL aquarists know of the Nile's electric eel stunning its prey with a 500-V pulse. Several slipped a dime into the slot at its tank in the pre-war New York aquarium to see this adapted to illuminate its name in neon above. The swimming muscles of non-electric fish generate low frequency electric signals as they swim through the earth's magnetic field. There's a play back by intruder fish which are attacked.

At Cambridge University, Cornell and now Sheffield, fascinating investigations by psychologists like Dr. G. Westby of Sheffield, as well as zoologists have shown how other freshwater fish like long-snouted Nile elephant or beaked fish workshipped by the Pharoahs, the Mormyrids, and South American knifefish, like the 200V gymnotid eel in London and New York aquaria, have evolved electrical communication or language. A series of weak signals is used to convey information of size, sex, age, threat, courtship and, like a radar, to find their way in darkness. Some can even jam predators' signals and avoid capture. It extends far beyond the grunts of spawning cod and haddock, for instance.

The electric organ in the tail produces only 2 or 3 volts, discharged from pores at its head, to pass through the surrounding "field" where any high or low-conducting objects distort it before it re-enters at the tip of the tail. Some fishes like the banded knifefish (*Gymnotus carpago*) use impulses separated by longer and more varied intervals than the other kind, "wave-type" like the glass knifefish (*Eigenmannia virescens*), with pulses of shorter intervals of 250-600 Hz frequency, with personal "private" frequencies. The former pulse types don't have this "private" frequency and their discharges can vary in 3 phases from 30 to 150 Hz, even so low as 1 Hz.

The electricity is generated from cells called electrocytes. Tuberous receptores in thousands of pores in the otherwise non-receptive skin are used to monitor the current-flow in the surrounding "field" for electrolocation of other electrical fish, giving information of size, age, sex, etc., of neighbours. Longer term variations in the discharge pattern indicate threat, submission or readiness to mate. The first pulses from young fish are



Sheffield University psychology department set-up for electric fish-language research. Elephant-fish *(Mormyrus)* in tank

SPOTLIGHT

The Crucian Carp

by Jack Hems

THE crucian carp or, to give the species its technical name, *Carassius carassius*, is found in the wild state over a wide range of northern Europe (excepting lands east of the Urals), but is patchily distributed, or completely absent, in southern Europe and the British Isles.

In this country it is confined mainly to the Thames basin or slow-moving waters in eastern counties where it can attain a length of about 10 in. or more and, exceptionally, a weight of nearly 5 lb. An unsuitable habitat as, for example, restricted swimming space in waters poor in oxygen and nutritive foodstuff will result in permanently retarded growth. For all that, *C. carassius* is a species that can endure hardship better than most river or pondfish. Indeed, its normal life expectancy in conditions not of the best may extend beyond six or seven years.

C. carassius is variable in body shape; for its living conditions determine its physical growth and form. Some individuals are similar in outline in their near relative the common goldfish (*Carassius auratus*); others have more space (depth) between back and belly. Then again, some individuals have small heads; others have big heads. Muus and Dahlstrom, in their book *Freshwater Fish of Britain and Europe*, Collins, 1971, tell us that too little swimming space and insufficient food is productive of big headed forms which they designate *'forma humilis'*.

The crucian carp is less attractive in coloration than a well-pigmented goldfish. In general it is greeny olive or greeny brown on the back shading through greeny or yellowy brown on the sides to a pale brass or yellow toned belly. The scales are large and overlaid with a metallic sheen; the mouth is toothless and barbless. Food is ground to a swallowable size or consistency by horny or bony processes in the throat before it enters the gullet.

C. carassius eats anything. To be more detailed, it will take any soft greenstuff submerged or at the surface including mossy and silky-soft algae, duckweed, small water life in general, tiny pieces of red meat, suicidal worms, crumbled bread, crumbled cake and, of course, the ubiquitous flake or pellet-shaped pondfish food.

All in all, then, the crucian carp has a lot going for it as a garden pond or coldwater aquarium fish. Ideally the aquarium for two young (small-sized) crucian carp should measure about 48 in. X 15 in. X 12 in. This size allows for reasonable but not embarrassing growth. Small pebbles are not advised as a covering for the bottom. The interstices between the pebbles permit uneaten dried or flesh food to lodge in the crevices and there turn sour. A grit with grains about the size of a split lentil can hardly be bettered. To help keep the water well-oxygenated and clear, a thick planting of *Vallisneria spiralis* is recommended. There are other plants just as efficient as oxygenators; but many have untidy growth and do not offer such favoured places of retirement which carp appreciate. The planting medium should be not less than 3 in. deep. An undergravel filter, which will guarantee clarity of water and a high standard of hygene (provided the aquarist follows the age-old rule of removing dead and decaying matter as soon as it is noticed) is a mechanical aid to successful aquarium keeping no busy or sensible fishkeeper can hardly do without. For put in other words, under-gravel filtration spares the aquarist the tyranny of siphoning the bottom clear of noxious mud every so often. Furthermore, whatever some people say to the contrary, plants grow just as well in 3 in. of grit over the u.g. filter plates as in grit spread direct on the bottom. Surely these two benefits alone are adequate reason for employing it?

Undeveloped crucian carp are not easy to sex. Quite well-grown specimens denote their sexual differences as follows. In small fish of about equal length, it is a trait of the female to grow faster than the male and soon show heavier build. The extra flesh is particularly apparent on the flanks. May to early July is the time for spawning. But spawning will not take place unless the water is

weedy and the temperature is well up on early spring levels. The fish spawn in typical carp manner. Both sexes don a brighter garb and become increasingly lively. Males drive females around and before long a couple (or couples or even a single male pursuing several females) end up, every so often, in the plant life where the shedding of male milt and female ova takes place. The eggs are adhesive and stay where they come to rest. Incubation may take place in about a week if the weather remains warm. On the other hand, a sudden drop in the temperature will retard incubation. A great number of eggs are deposited during a spawning. Reliable authorities state the number of eggs released as between 150,000 to 300,000. This, however, is nature's way of preventing the species dying out; for the toll exacted on eggs and fry is tremendous. There are untold little and large predators awaiting a feast after every spawning—in the natural pond, and in some garden ponds, too

After hatching, the fry attach themselves to fixed or waving objects by 'attachment organs in front of the eyes (Muus and Dahlstrom)' and stay until the yolk sac is absorbed. Thenceforward they go as their fancy takes them but still have their work cut out avoiding enemies and finding sufficient food to grow them on to healthy maturity. As a rule, this is reached in some four or five years of hatching. Male fish become sexually mature before female fish.

The crucian carp is not too popular with the keen angler because it robs the large and cunning carp called *Cyprinus carpio* (with barbels) of a lot of natural food. *C. carassius* is popularly known as the bronze carp.

A-Z of the Aquarium

Egglayers

One of the great advantages that water has over land is that it offers those animals living in it the possibility of external fertilization, something that is denied their land-living counterparts. As a result we find that both internal and external fertilization methods have been exploited to the full by aquatic organisms, including fish. External methods become possible in water because sperm require just such a medium in order to fulfil their role of fertilising the eggs. In land-living animals, the fluid has to be provided by the male and introduced into the body of the female along with the sperm. Once inside the female, the sperm can then swim in the normal way towards the eggs. Fish that reproduce by means of external fertilization are generally known as *Egglayers*. Egglaying is known as *Oviparity*.

When one takes into consideration the fact that fish as diverse as Sharks, Characins, Seahorses and Cichlids all exhibit oviparity, it is hardly surprising to find that numerous variations on the same basic theme or format exist.

Two batches of Bullhead eggs

These variations range from total abandonment of eggs and/or fry, as in Barbs and Tetras, to intense brooding, as in many cichlids such as Mouthbrooders and Angels. As a rule (bearing in mind possible restrictions caused by size) an increase in the intensity of parental care is accompanied by a corresponding decrease in brood size. Irrespective of the strategy employed, developing egglayer embryos derive all their nourishment from the yolk in the egg and are often born before full development is reached. This is achieved during the first few days after hatching, its completion being marked by the attainment of the free-swimming stage.

There is a second, rarer, form of egglaying that, in some ways, bridges the gap between egglayers and livebearers. This method is found in some Skates, Chimaeras (Ratfishes), Sharks, a Poeciliid (*Tomeurus*) and in a most unusual fish called *Horaichthys*. All these fish fertilize their eggs *internally* but release them into the water after a shorter or longer period of time. This type of oviparity is called *Ovi-Ovoviviparity*. As in "normal" egglayers, ovi-ovoviviparous species show synchronized reproductive behaviour between males and females to varying degrees.

Featherbacks

***Notopterus chitala*, the Clown Knifefish**

Featherbacks are also known as Knifefishes. However, they can be distinguished from other Knifefishes, such as those mentioned under "Electric Fishes," in a number of ways:

(i) The "electric" Knifefishes of the Families Gymnotidae, Apteronotidae (= Sternarchidae) and Rhamphichthyidae, all come from Central or South America while the Featherbacks are distributed from Africa to Southeast Asia. Of course, this is of little help when one is confronted with a Knifefish in an aquarium or petshop. Fortunately, there are other distinguishing characteristics.

(ii) The Featherbacks (which belong to the Family Notopteridae) have, as their name suggests, a dorsally located "feather". This refers to their small, pennant-like dorsal fin which the American Knifefishes lack, although some of the Apteronotidae may have a very long, filamentous fin without any rays. One species of Featherback, *Xenomystus nigri*, does not have a dorsal fin at all but can be distinguished from the American species by the following characteristics which it shares with its close relatives.

(iii) Featherbacks have prominent growths on their nostrils which are sometimes referred to as "tentacles." These are absent in the American species.

(iv) The eyes are large and well-formed in Featherbacks, but much less so in the American Knifefishes.

(v) The Notopteridae do not generate electricity, while the three other Families do.

There are three genera of Featherbacks, *Notopterus*, *Papyrocranus* and *Xenomystus*. Most aquarium books actually refer to only two genera, subsuming *Papyrocranus* within *Notopterus*. The species over which this confusion exists is the one usually classified as *Notopterus afer*. However, the absence of pelvic fins, the possession of fewer dorsal rays (6 to 7 as opposed to 8 to 10) and a wider range in the number of branchiostegal rays* (6 to 9 instead of 8 or 9) may well justify the separation of the two genera, making the name *Papyrocranus afer* probably the more correct of the two.

Featherbacks are large (20-60 cm), twilight or nocturnal fish with healthy appetites and a scrappy disposition. These factors, therefore, need to be borne in mind and catered for adequately if disappointment and/or disaster are to be avoided.

**Footnote:* Branchiostegal rays are slender, rod-like bones which are located below the gill-covers, ventrally, forming part of the supporting or protective structures associated with the gills.

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Electric Fishes

THE production of an electric current by some species of fish is well-known. However, in most of the publicised cases this phenomenon has been described in terms of the damage that it can cause rather than its biological significance. We are, therefore, told that the Electric Catfish (*Malapterurus electricus*) and the Electric Eel (*Electrophorus electricus*) are capable of producing 350 Volts and (in extreme cases) 650 Volts respectively, the latter being sufficient to stun a horse.

Equally significant, but less well publicised, is the fact that the generation of electricity is known in ten Families of fish, representing six Orders. In addition to those already mentioned (the Malapteruridae and Electrophoridae), there are two other "strong generators," the Electric Rays (Torpetinidae) and the Stargazers (Uranoscopidae).

Among the "weak generators" are the marine Skates (Rajidae). Of significance to the aquarist are other "weak generators," such as the Elephant-fishes (Mormyridae), the closely-related Gymnarchidae and three Families of Knifefishes, the Gymnotidae, Apteronotidae (= Sternarchidae) and Rhamphichthyidae.

The electric organs themselves are extremely interesting in that (with one exception, the Apteronotidae, where they are derived from nerve cells) they are made up of modified muscle cells, called electrocytes, which are capable of "concentrating" the electrical currents that are produced by nerve endings in normal muscular contraction and releasing the electricity in a controlled manner, each species having its own unique pattern of emission.

Although, in many species, electricity is used in attack and/or defence, some of the aquarium species may produce too little power for this. Many seem to use their electricity for two other main purposes. One is associated with the turbid environment in which these fish are often found and the twilight or nocturnal habits of the species concerned. By generating pulses, or continuous tones, they are able to bounce the signals off objects, thus painting an electric picture, as it were, of their immediate surroundings.

The Spotted Knifefish *Hypopomus artedi* can grow up to 60cm

Electrical discharges may also be used in recognition, members of the same species being able to find each other by the nature of the signals. In at least one Knifefish, *Sternopygus macrurus*, the males are reported to be able to vary the discharges in a way that the females cannot, thus taking the use of electricity even a stage further.

Fingerfishes

FINGERFISHES, also known as Moon-fishes, belong to a small Family, the Monodactylidae, represented by only three genera, *Psettias* (one species), *Schuettea* (two species—at least one authority suggests that this genus should be placed in a Family of its own), and *Monodactylus* (two species). Of these, the only genus that has ever become popular among aquarists is *Monodactylus*, alternatively known as the Monos or Malayan Angels.

M. argenteus comes from Malaysia, East Africa and the Red Sea area, while *M. sebae* hails from Tropical West Africa. Both species are found in coastal waters, estuaries and, at times, freshwater.

Monos are very active fishes which are at their best in shoals. However, bearing in mind the relatively large size they grow to (around 20cm), they are usually kept singly with one or two Scats (*Scatophagus argus*) or, at best, in small groups of two or three. Of the two species, *M. argenteus* is the one more commonly kept. *M. sebae* is only rarely imported. Besides their shape, Monos also have unusual pelvic fins which are reduced to a few tiny rays which perform no obvious useful function.

Although young Monos will tolerate freshwater, they will not survive long (i.e. rarely beyond 5cm in length) in this environment. Brackish (approx. 1 teaspoonful of salt per gallon) or fully marine conditions are essential for the long-term well-being of both species, particularly *M. argenteus*.

***Monodactylus argenteus* requires brackish or marine conditions for long-term survival**

Despite their size, Monos are quite peaceful towards other species and are, therefore, good community fish for a brackish aquarium containing species such as Mollies (*Poecilia* spp) and Chromides (*Etroplus* spp). In the wild, they are often found in large shoals in the vicinity of sewage outflows. In this way, and in the fact that virtually nothing is known about their reproduction, they are similar to Scats (*Scatophagus argus*). Specimens imported for the hobby are invariably juveniles and, almost always, attractively marked. As they grow, though, these colours fade unless a transition to truly marine conditions is effected. Therefore, if adequate conditions cannot be provided, it would be fairer to pass them on to someone who can do so when signs of distress begin to show.

BUILDING A FISH CUPBOARD

William Hogg

ELEVEN YEARS of keeping tropical fish had resulted in an assorted collection of odd shaped tanks and equipment but never the completion of a much needed fish-house, due mainly to the expense of building such a structure. The recent move into an old period house provided me with the possibility of converting a walk-in cupboard into what I was looking for.

On the credit side was the immediate advantage of not having to buy or build a shed outside and few problems of heat loss as the outside walls were made of cob and many feet thick. Nevertheless I did have the problems of an excessive weight on the floorboards as my cupboard was on the upstairs floor of the house. An approximate estimate at this stage showed that the weight of water would be around eleven hundredweight, and that rocks and gravel could add about another two hundredweight to this.

The cupboard

The size of this room was, at first glance, somewhat small for a fish-house and measured just over six feet long by five feet wide, with a height of seven feet. There was no window and thus no natural light, and access was through a door which opened outwards onto the stair landing. In the ceiling of my proposed fish-cupboard was a hatch-way which led into the loft.

The main wall in the cupboard was five feet long and on the left hand side, and this was to hold four tanks, two on top of another two. Two tanks each of three feet by fifteen inches by twelve inches, and two tanks eighteen inches by fifteen inches by twelve inches.

The right-hand side of the cupboard was broken up by a chimney breast which served a room downstairs and allowed me room for further tanks at each side of it only. Each alcove was to hold two tanks, one on top of another, and were to be all the same size. Eighteen inches by fifteen inches by fifteen inches.

The total number of tanks within this small room therefore would be eight, four on the left-hand wall and four on the right, and this would leave me with a working space in between for myself of four feet. (see diagram A).

With the question, 'would the floor hold such a weight ?' i.e. approximately thirteen hundredweight, always in mind I tackled the project in the following way.

The floor

This was my main concern and I lifted the floor-boards and examined the joists thoroughly. These were the original cross beams built into the house five hundred years ago, made of oak, and apart from a little woodworm damage, quite solid. The insulation was adequate as the original builders had left quite a lot of small rubble and wood shavings under the floor-boards when they built the house, and once I had replaced the floor-boards I covered the whole floor with chipboard to help spread the weight of the proposed tanks of water.

Diagram A
Sketch of cupboard looking down at it from above.

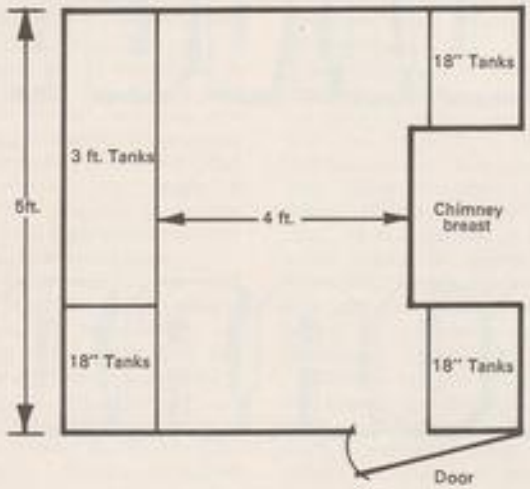
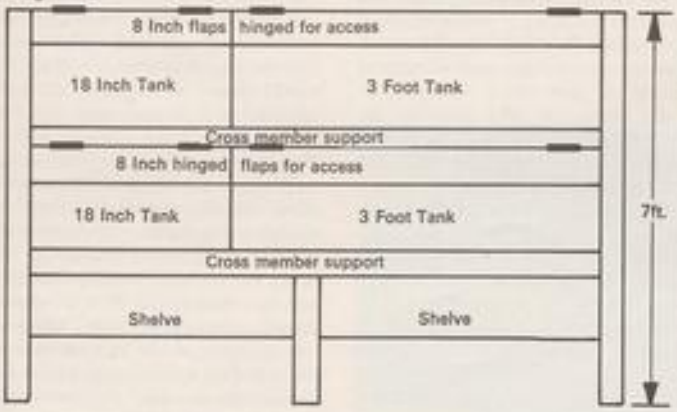


Diagram B



Insulation

As the walls were so thick I had only two areas of heat loss to concern me. The first area was the ceiling and hatchway through into the loft. This I covered with one layer of 100 mm Gypglass and I have no hesitation now in recommending this to any aquarist looking for a good insulation material.

The second area of heat loss was the door and I tackled this problem by hanging a thick curtain on the inside of the door. This has served my purpose adequately but is not highly proficient and can still be improved upon.

Framework for tanks

Building a framework to hold the tanks was the most important aspect of the project, for I had to create a system which would spread the weight evenly and yet keep as much of it as possible off the floor.

To do this on the left-hand wall I built a series of shelving, two to hold the tanks and one underneath to hold equipment and books. The cross members which supported the tanks were six inches by two inches and the upright stanchions were two inches by two inches. Each upright stanchion was fixed to a wall by screw-nails, eight inches long, which diverted most of the weight from the floor onto the walls. In addition, the cross members as well as resting on those stanchions also had eight-inch screws fixing them as well to the walls. On top of the cross members I laid a half-inch chipboard to form a level shelf to lay the tanks on.

To gain access to the tanks an eight inch high hinged flap was hung above the top level of the tanks on each shelf. (see diagram B).

The whole wooden framework, once completed, was painted black and the ceiling and walls of the room were painted white. In addition a green carpet piece was found at this stage which covered the floor space and was cut to fit it exactly.

The framework required to support the tanks within the alcoves on the right-hand wall were built slightly differently, as it was possible to ram the cross members tight across the alcove space, and resulted in this side being

completed without any weight being placed on the floor at all. Eight-inch screw nails were used as on the other side to ensure that the real weight was taken by the walls.

Fish tanks

The six eighteen inch tanks were all made for me at a reasonable cost by the local aquarist shop to the exact size that I requested, and I bought the two three foot tanks direct from their stock. It is worth mentioning at this point that one should be wary of sizes advertised as not all tanks are as much as the fifteen inches in height that they are said to be.

All of the tanks were placed in position on top of polystyrene ceiling tiles after having been cleaned out thoroughly with salt and water.

Lighting

I was able to do most of the wiring myself but nevertheless asked an electrician friend to connect it all together for me to be on the safe side. To do this I purchased double control-units, that is, the type which can feed two fluorescent tubes from the one control unit. There were three of these. One served the tanks on the left hand wall and was connected to two four foot long forty-watt tubes, one tube for each level of tanks.

Each alcove had its own double control-unit serving two eighteen inch long fifteen-watt tubes. I would recommend now, with hindsight, a stronger lighting system than fifteen watts for the alcoves.

The electrical wiring ran up through the ceiling to the control-units and connection boxes which were placed up in the loft well away from condensation, and were connected in turn to a triple switch which was placed just outside the door. One switch was for the lighting and the other two for the heaters and pumps.

Heating

For a heating system I placed two-hundred watt combined heater/thermostats in the bottom tanks only, believing that this would be adequate. This is now not recommended as the temperature in the top tanks, especially the eighteen inch ones, does not remain constant in cold weather, and all of the tanks require their own individual heating.

I chose Interpet Super Maximatic heaters principally because of their extra long wiring cables which enabled me to join them to the connection boxes up in the loft.

Filtration

I fitted C.V. undergravel filters to all of the tanks and attached their airlines to two Rena 301 pumps plus a thirty year old piston pump in the loft. This was a mistake as the water bubbling away in the tanks could be heard from the bedrooms next door and I could find no way of reducing this background noise and eventually had to do away with a permanent filtration system. The pumps and airlines nevertheless have been invaluable for syphoning out the tanks and connecting to box-filters for day time use.

I find at present that replacing one third of the water in each tank every month keeps the water fresh along with syphoning the mulm from the gravel.

Splash Lids

All of the tanks were fitted with plastic splash lids but I wasted a lot of time looking for the exact sizes that I needed, only to find out eventually that it was not possible to obtain them fifteen inches wide.

For each one of the tanks that size I used a twelve inch one and added to it a three inch strip which I cut from another splash lid.

I saved quite a bit of money here by being able to purchase used lids from an aquarist shop that no longer required them.

Setting up the Tanks

With the completion of the project and the tanks and equipment now installed came the critical moment of putting to the test the initial question 'would the floor hold the weight.'

First the gravel was installed, forty pounds in the three foot tanks and twenty pounds in the eighteen inch ones. I had already tested the strength of the shelving that the tanks were to stand on by having a friend and myself sit on them, a combined weight of three hundred pounds. Then the water was poured into the bottom tanks slowly, a few inches at a time, until they were almost full. This I left to stand for two days before I repeated the exercise with the top tanks. All was well. Nevertheless I left everything as it was for a further week to make sure that there would be no problems and this also allowed the water to mature during this period. The plants which I had ordered by post arrived at the end of this week and were installed immediately and the tanks topped up with water.

Fish

On the same day that I planted the tanks I transferred from a tank in another part of the house the first occupants of my new fish-cupboard, six full grown Angelfish and a breeding pair of Kribensis.

The following day I went on a minor spending spree and purchased ten Neon Tetra, six Cherry Barbs and six Pearl Gouramies, which I introduced into my new tanks. I also had a bonus that day as two of the Angels which I had moved in on the night before had laid a large number of eggs on the leaf of an Amazon Sword Plant, and I was able to remove those and hatch them out in a tank of their own.

Two years later

It is almost two years now since I completed my fish-cupboard and all is still well. The lower shelving has been pressed into service to hold three further small tanks of eight inches by six inches by six inches, and are used regularly for holding young fish or for hatching out eggs.

There have been minor operational problems of transporting water up and down stairs and through the house as, of course, my fish-cupboard has no water on tap, and in the summer months the room tends to overheat and I have to open both the door and the trapdoor to the loft to give a through air in order to maintain an acceptable temperature. But neither of those problems is of any consequence to a keen aquarist and indeed, probably adds to its appeal.

Tomorrow's AQUARIST

WHO *IS* "TOMORROW'S AQUARIST"?

It could be said that tomorrow's aquarist is in school today. This is true, of course, but such a view would set an artificial age limit which would restrict our definition unnecessarily.

Equally, one could say that tomorrow's aquarist is today's non-aquarist, irrespective of age. Again, this is true. However, we can take things a stage further by saying that anybody who is enthusiastic, interested or committed enough to be willing to learn will be a better aquarist tomorrow than s(he) is today. It is in this broad frame of mind that we are approaching our new series. We will, therefore, be featuring a wide range of items, all of which will have one thing in common:

They will be concerned with activities, facts, ideas, opinions, anecdotes, competitions or experiences aimed at developing the skills and knowledge of aquarists of all ages.

Whenever possible, we will be presenting a monthly 'Mixed Bag', both in terms of content and ages. Of course, the success of the series will depend, to a large extent, on the contributions that we receive from you. We, therefore, extend an open invitation to Societies, individuals (of all ages) and institutions to inform us of anything which they may feel will help 'Today's Aquarist' develop into 'Tomorrow's'.

Please send your contributions to:
'TOMORROW'S AQUARIST',
THE CONSULTANT EDITOR,
AQUARIST & PONDKEEPER,
THE BUTTS, HALF ACRE,
BRENTFORD, MIDDX.
TW8 8BN.

YOUNG AUTHORS

Two young Scottish aquarists are making a start in what could, hopefully, develop into a successful career. They are Andrew Grant and Philip Quinn, aged 14 and 13 respectively.

This is the cover of the Revised Edition of the beginners' tropical booklet

Andrew and Philip both attend Queen Anne High School in Dunfermline and have long been interested in pets, particularly fish and axolotls. Although they do not belong to any official Society, they are, obviously, very keen aquarists indeed. Andrew recently sent us copies of two booklets, one that he wrote with Philip entitled *Your First Tropical Aquarium* (Revised Edition) and another on *Axolotls* that he wrote himself.

Axolotls by Grant/Quinn Productions

Both booklets are packed full of useful hints, information and well-drawn diagrams, as the accompanying illustrations clearly show. Congratulations, lads—we wish you great success. Anyone wishing to contact Andrew or Philip may do so by writing to Andrew at 45 Cameron Street, Dunfermline, Fife KY12 8DP.

FISH BIOLOGY FOR AQUARISTS

Response to the advertisement that we carried in our March issue has been so favourable that the team of lecturers from the City of London Polytechnic who are putting on this course have gladly agreed to repeat it. The new course will run from October to December and will follow the same general pattern as the current one.

Therefore, it will include lectures, discussions, films and practical laboratory sessions on topics such as water chemistry, fish anatomy, reproduction, diseases, behaviour, algae, evolution, unusual fish (like the Electric Catfishes in the Department's collection) and many more.

Fish diseases will be dealt with on the course

No entry qualifications of any kind are required for these courses but there will be a Registration Fee of about £25 for the October/December one. This will cover tuition, equipment, chemicals and use of library facilities at the Polytechnic.

Apply to: Dr. Anne Powell, Biology Department, City of London Polytechnic, Calcutta House, Old Castle Street, Aldgate, London E1. Tel: 01-283 1030, Ext. 324.

SCHOOL ENTRIES AT SAF 1983

A small part of the Aquatic Art Section

A close-up of a beautiful Anemone

THIS year's Scottish Aquarist Festival took place at the Civic Centre in Motherwell between 18 and 20 March. (See full report elsewhere in this issue of *A & P*).

It is always very pleasing when provision is made at major fishkeeping events for young enthusiasts. In the case of S.A.F., an Aquatic Art Section is always run for the very young (up to Junior School age) and this year the 200 or so entries were particularly good. The judges must have had a very difficult job indeed in choosing the winners from the wide range of pen, pencil and crayon drawings, and papier-mache shapes of underwater creatures such as crabs, anemones, fish, etc.

The S.A.F. Committee believe in introducing potential aquarists to the hobby as early as possible, and, therefore, also run a Schools' Furnished Aquarium Section which is usually hotly contested. We offer our congratulations to the S.A.F. Committee for their foresight and to all the worthy winners (see full report for names).

A highly original Crab

Coldwater Jottings

by Frank W. Orme

THE holiday season is now getting into full-swing, as fishkeepers head for near and distant parts in the annual migration to search for the sun. There will, as usual, be others who fear to leave their fish and therefore remain at home. This unwarranted fear is much more evident amongst newcomers to the hobby, especially when the fish are housed in aquariums—pond-kept fish do not appear to cause quite so much anxiety, presumably because it is thought (quite rightly) that the owner's absence will not bring untold harm.

The truth of the matter is that, providing the fish have been properly cared for, healthy fish can be left to their own devices for two or three weeks quite safely. In fact the greatest risk to the well-being of the fish is often the over-zealous person who is asked to take care of the feeding. Over generous feeding can result in badly polluted water which, in turn, may well spell disaster as the aquarium inmates begin to die. There must have been many friendships which have been sorely tried when the fishkeeper has returned to view the sad spectacle created by a well-meaning friend or neighbour.

Feed the fish well for some days prior to the holiday, being sure to remove all uneaten non-live foods. Clean the aquarium and replace about one-third of the water with fresh clean water. It is not necessary to remove any algae from the back and side glasses, in fact the fish will enjoy browsing upon the green growth if they are able. If the lights can be operated from a time switch to provide the required hours of illumination, the plants will benefit accordingly. Finally, ensure that the fish are in good condition and healthy. Satisfy these simple requirements and you may depart for the holiday in the knowledge that, short of the unforeseen, there should be no problems to mar your return and, quite possibly, the fish may be all the better for their holiday. Take my word for it, the coldwater fish will not miss your care, or suffer, if you take a couple of weeks away from them.

Forthcoming shows

On Saturday, the 18th of this month, the South Park Aquatic (Study) Society are staging their annual coldwater open show at the Wimbledon Community Centre. They are anticipating a record entry of Fancy Goldfish, Koi, and Native and Foreign Species, plus entries in the classes for plants. The Northern Goldfish and Pondkeepers Society have arranged their very popular open show date, this will be August 6th and will be staged in the Silverwell Sports Centre, Bolton. The Goldfish Society of Great Britain are taking their open show to Scotland, and have chosen Edinburgh as the venue. 27th August is the date to note for this event. Established many years ago, the annual open show organised by the Bristol Aquarist's Society is one event that should not be missed. The venue for this show is St Ambrose Church Hall in Whitehall, Bristol and will take place on the 10th of September. Details of the specialist shows can be found, in this magazine, under 'Dates for the Diary' heading.

Enthusiasts of the coldwater fish should endeavour to visit at least one of these shows, where they will be able to view some really top quality exhibits. These events also provide an ideal opportunity to meet, and talk with, some very experienced fishkeepers, most of whom will be only too pleased to answer questions or discuss the various exhibits that are displayed.

Mrs Pauline Hodgkinson compiles the monthly newsletter of the Northern Goldfish and Pondkeepers Society, and makes an excellent job of it. In the February issue she voiced concern that a society had a remarkably similar title to that of the N.G.P.S. She felt that there was such a great similarity that it was likely to lead, at some time, to confusion between the two societies. She wondered what thought her fellow members had, and asked whether anything could be done. In point of fact I do not think anything can be done in a case of this kind; however, I do agree that the titles of the two groups are so alike that some confusion could arise. In most instances societies try to pick a title which is distinctly their own and try to avoid any similarity to the title of any other group. In this way they ensure that they cannot be mistaken for, or wrongly identified

Lionhead

Coldwater Jottings

as, another unrelated group. Perhaps diplomacy, and a tactful approach, may resolve the problem of any possible future confusion—the other alternative is to accept the situation and hope that this remains an isolated case. When all is said and done, I doubt that the similarity of the title was intentional, or intended to confuse, and, to be honest, I was not aware of the Northern Coldwater Fish and Pondkeepers Society until I saw it mentioned in the N.G.P.S., newsletter.

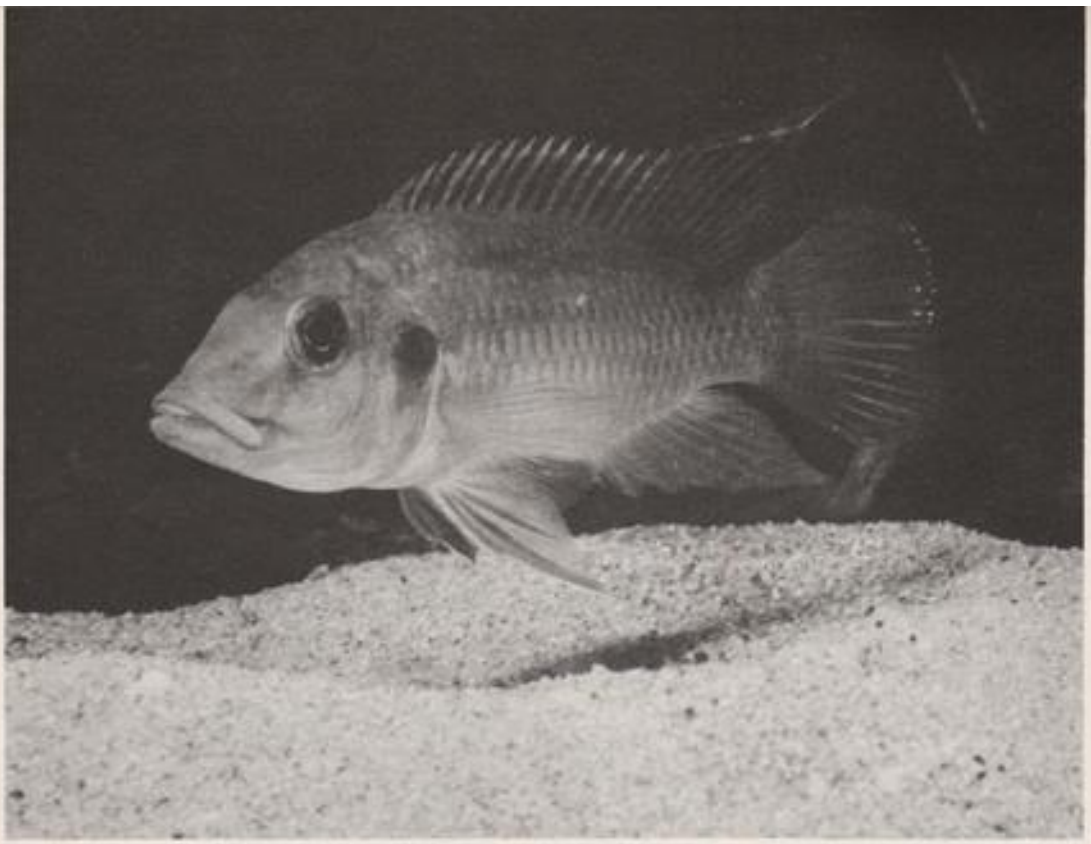
An interesting day can be spent in Cheshire visiting the Stapeley Water Gardens. This is claimed to be the largest water garden centre in Europe and covers a site area of over 35 acres; it has over 40,000 square feet of showrooms, a "Coffee Shop" and numerous landscaped display pools. Visitors will find much to interest them, the displays covering a wide field, ranging over such things as house plants, alpines, conifers, heathers, garden furniture, pool liners, rockery and paving materials, greenhouses and conservatories, aquatic and marginal plants, coldwater and tropical fish, water pumps, fountain and waterfall kits, and—well, you name it and it is probably there, right down to nets, books and fish-foods.

This privately owned company produces an excellent handbook for those who are unable to make a personal visit and this is well worth obtaining. The 1983 edition is probably the most comprehensive yet produced. Running to 55 pages it is very well illustrated in colour, and contains a great deal of useful advice. A great many items are fully described. Of particular interest is a new range of competitively priced pumps, manufactured in West Germany, which carry a 2 year replacement guarantee. A novel idea is the Illuminated Musical Fountain which is computer controlled to give changing spray patterns synchronised to the lighting and music—they are described as 'ideal for discoteques, hotels, theatres and restaurants. . . .' Also listed is a reasonably priced Power Breaker, a most sensible safety device wherever electricity is used outdoors or in proximity to water.

A copy of this excellent handbook is available by sending 25p in stamps to Stapeley Water Gardens, London Road, Stapeley, Nantwich, Cheshire CW5 7JL.

Finally, the British Koi-Keepers Society are staging their KOI '83 Open Show on Sunday the 26th of June, at Billing Aquadrome (Pleasure Park) Little Billing, Northampton. An event not to be missed by enthusiasts of the Koi.

OSCAR **G. Robinson**



The male

AN IMPRESSIVE Mouthbrooder

Chromidotilapia guentheri

by K. Lejska

Photography by R. Zukal

WHEN I FIRST read about these cichlids in our aquarist magazine, I decided I wanted to keep them. They were large, impressive fish and, furthermore, mouthbreeders in that the young were looked after in the mouth of adult males. I had to wait for a few years, however, before I was able to obtain these fish.

Chromidotilapia guentheri comes from the coastal lagoons and coastal area of the Ivory Coast as far as Gabon. They live in pairs in still or slow-moving waters which are full of sunken branches and water-plants and have a bottom of soft mud. Although the fish come from the tropics, they are able to cope with quite big fluctuations in temperature, between 18° and 28°C.

The largest fish I kept attained a size of 15 cm. In the wild they probably grow even bigger. They are imposing fish, whose most attractive features, I find, are their large mouths and eyes. The females have a brighter coloration than the males. Their orange dorsal fins with black markings at the base of the fin are very attractive. The upper edge of the caudal fin is also orange. The dorsal fin of the male is almost colourless, only the inner edge is decorated by an orange band and the ends of the finrays are black. The ground colour is light brown, with the abdomen yellowish-brown. The head is darker, having an olive green colour and the upper half of the body has a greenish sheen. The sides of the head have a rather indistinct black or, more accurately, darkish spot. The eye is large and dark with a red iris. The body has, in differing degrees of intensity, horizontal and vertical bands. The horizontal bands are in the middle of the body, supplemented by four to five vertical bands. The colour intensity is dependent upon the mood of the fish. At night the fish are much darker than when the aquarium is illuminated. The coloration as a whole can be simply described as elegant.

Large specimens are relatively shy. If they are kept on their own, they stay in a number of hiding places between stones and plants and only swim out at feeding times. The presence of other peaceful, largish fish reduces their shyness. Although

I have read that individual specimens may be aggressive, I have never observed this in my own fish and so cannot confirm this claim. All the specimens of *C. guentheri* I have kept have been gentle, other species were not attacked and the presence of other fish ignored, even when these were small fish. Even small species of livebearers came to no harm. The males indulge in fights of rivalry amongst themselves. The result is an interesting spectacle and, apart from torn fins, I have never witnessed serious injury. During the combat they threatened each other with wide-spread gill-covers and by puffing out their bodies in the area of the gullet, before hitting at each other with their caudal fins.

I feed them with *Tubifex*, mosquito larvae, live *Daphnia* and Cyclops. In other words, with relatively small foodstuff, as they do not accept chopped meat or earthworms as other large cichlids do. They dig up the bottom in the vicinity of the spot where they are fed, but plants are not dug up or otherwise destroyed. In addition, I have had no problems in keeping the water in the aquarium clean.

I obtained some of these fish for the first time in 1968, but was unsuccessful in breeding them. The fish spawned willingly enough, but the hope of young fish was always removed by the male, who had kept the eggs in his mouth, eating the brood after a few days. I did not manage to rear any young until 1975, through a newly obtained pair. Bringing together a suitable pair is the greatest problem. Success depends on both partners, in fact, for the female has her part to play too in looking after the young. From the small number of young I retained only twelve for use in further breeding experiments. From these specimens I formed two excellent pairs and in the following year I was able to rear many more young fish.

I placed a few curved roof tiles in a 160 litre tank, so the fish had sufficient cover for their love life. Out of the large number of spawnings which took place over a few years I was able to observe only two. On the first occasion, the eggs adhered to the rear wall of the tank and, grouped like a bunch of grapes, they swung to and fro with any movement in the water, attached to the glass by short filaments. The female added further eggs after adopting a position with her head pointing downwards. Then the male relieved her and fertilised the eggs in a similar fashion. Other fish were driven away from the vicinity of the spawning site. In order that the fish which were spawning would not be disturbed, I carefully removed all the other fish. After about an hour the male took the eggs into his mouth. The second spawning I was able to witness resulted from the eggs being deposited on a stone set at a sharp incline, but as always the fish spawned in a secluded spot. The eggs are yellowish and number between a hundred and a hundred and fifty.

In the case of good pairs the female behaves with tact—if one can so describe it—towards the male and when the young leave the father's mouth she helps him to watch over them. After spawning the throat of the females also increases in volume, but the females feed after spawning and do not look after the offspring until after they have hatched. This is not a hard and fast rule, however, for I have seen a female engaged in mouth-brooding activity. During the whole time of their development she did not feed and arranged the young in her mouth with the typical chewing movement. Many females pursue the male after spawning and if they are not removed the male may be injured or even killed. Perhaps they are intent on obtaining a share of the eggs for themselves in order to look after them. In most cases such an occurrence results in the male eating the eggs. In general, one must say that no definite conclusions can be made on the basis of a single pair which could automatically be applied to another pair of fish. The fish are individual in character.

The time the eggs take to develop varies and depends on the water temperature. At a temperature between 25° and 28°C. the fish leave the father's mouth after about fourteen days. When it is not necessary to remove the female after spawning, both of the parent fish lead the young about the tank and offer them a refuge in their mouths during the first days of life. The young are about 8 mm in size after their first forays into the open and grow quickly. I feed them immediately with small Cyclops. Larger foodstuff is pulped by the adult fish and spat out amongst the young, as is the case with *Cichlasoma meeki*. One can soon feed with chopped *Tubifex* and medium-sized *Daphnia*. After three months the young are about 4 cm in size and after nine months at a size of 8 cm they are sexually mature.

These fish are, at present, kept only by cichlid specialists. In the bare tanks of aquarist dealers the young fish are shy, colourless and keep near to the bottom, with the result that aquarists take no great interest in them, since they have no idea into what splendid fish they will grow. I hope these fish will come to enjoy greater interest from aquarists in future.

The female

Meet the Societies

HARINGEY AQUARISTS' SOCIETY

The H.A.S. Logo

Tilapia buttikoferi

"UNLIKE Piranha, we don't bite!" So reads the open invitation offered to aquarists in the North London area by the Committee of this relatively new and thriving aquarium society. You'll certainly be made more than welcome on the 1st and 3rd Thursdays of every month at 8.15 p.m. at Pax Hall, 59 Park Road, Hornsey, London, N8 (opposite the "Maynard Arms" Pub)—A good location if ever there was one!

H.A.S. was formed in February 1980 to enable aquarists in the North London area to meet and exchange stories, views and fish. Shortly afterwards, the Society joined the Federation of British Aquatic Societies (F.B.A.S.) who provided the backbone of the first year's programme.

In its second year, the Society launched its Newsletter, "Guppy Gossip", aimed at keeping members abreast of developments. This year, "Guppy Gossip" has been expanded into a full magazine featuring Club News, articles, quizzes and advertising from local dealers.

H.A.S. runs a number of competitions, leading to various awards, such as Clubperson of the Year, Showperson of the Year and the Best Breeder Trophy. The Guppy Gossip award goes to the author of the best article published in the magazine in the previous year. In addition, all members are encouraged to show their fish at the twice-monthly meetings, culminating in the Society Supreme Championship at the end of the year.

H.A.S. held its first Open Show in March 1983 and attracted over 450 entries. More than 300 people attended the Show, giving the Committee great encouragement for the future. As a result, shows are now being planned on coldwater, tropical and marine fish, as well as plants and "international" aquaria.

Weekend activities include trips to the major National Shows, the Goldfish Bowl in Oxford and a "Tour de Fish" when Society members meet and visit several aquatic shops in one specific area.

Subscription Rates: Single Membership, £5·00; Juniors (under 16) and O.A.P.s, £2·00; Half-yearly Membership, £2·50 and £1·00 respectively.

Apply to: Mr. Adrian Dempsey on 01-272 1884 (evenings) or Mr. John Taylor (Membership Secretary) on 01-800 7772.

THE BRITISH KOI-KEEPERS' SOCIETY

The B.K.K.S. Logo

Prize Koi

KOI, so popular today, have enjoyed a spectacular "rise to fame" in this country since the birth of the B.K.K.S. in 1970 under the auspices of the late Ken Fawcett. Such was the enthusiasm of the small group of founder members, and such is the beauty and fascination of these magnificent fish that, within five years, the Society had recruited some 400 members. By April 1983, this number had risen to 2,450 and this is likely to continue as more and more people become better acquainted with Koi. The history of the B.K.K.S. is, therefore, one that is probably unequalled in the fish world. The regular influx of members is such that in 1983 subscriptions will remain unchanged for the fourth year running.

With such a fast-growing membership, it soon became desirable to establish area groups, the first of these being the Northern Region (constituted in 1973). Today there are sixteen Sections throughout the UK, namely in: Birmingham, North of England, South Wales, Avon, Wessex, Swindon, London, Lower Thames-side, Essex, East Anglia, Norwich, Peterborough, Northampton, Nottingham, South East and Mid-Staffordshire.

These groups meet regularly and contribute, in no small measure, to the firm establishment of the Society. Details of local Secretaries may be obtained from the Membership Secretary.

B.K.K.S. run regular seminars and invite experts in particular fields to address the membership at both national and regional meetings. In addition, there is a monthly magazine as well as regional and national competitive Koi-Shows.

Incidentally, take a close look at the B.K.K.S. logo that accompanies this article. Can you make out the map of the British Isles? Brilliant—isn't it?

Subscription Rates: Single Membership (UK), £7·00; Family Membership, £7·50 (50p for each additional member); European Membership, £12·00; Overseas Membership (Non-European), £15·00.

N.B. Anyone joining during the Society year (1st May—30th April) will pay the annual rate and will receive the magazines for the whole of that year.

Apply to: The Membership Secretary (Mrs. E. Liddicoat), 2 Horncastle Road, Moston, Manchester M10 9GD.

NEWS...

From Aquarists' Societies

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

SOUTH WEST

THE **Bournemouth A.S.** held its annual open show on 8th May and the winners of each class were as follow: Class B: N. A. Pavey (Petersfield). C: S. Norris (Bracknell). Ca: M. Paxton (Basingstoke). D: W. Knight (Havant). Da: D. Cox (Yeovil). Db: D. J. Rumsey (Ind.). Dc: J. Varndell (Plymouth). E: C. H. Amey (Dorchester T.F.S.). Ea: J. Robinson (Portsmouth). F: D. J. Rumsey. G: P. Armstrong (Bracknell). H: M. Paxton (Basingstoke). J: C. H. Amey (Dorchester T.F.S.). K: I. Bebb (Bournemouth). L: S. Norris. M: S. Norris. Nb-m: G. Ford (Bracknell). No-t: A. Chaplin (Basingstoke). Ma: C. H. Amey. O: C. T. Ralph (Basingstoke). P: P. Andrews (Reading). Q: A. Chaplin. R: C. H. Amey. S: R. P. Adams (Salisbury). T: C. Tonna (Reading). U: A. Barnes (G.S.G.B.). Ua: L. A. Goff (Blackmore Vale). V: A. Barnes. W: J. Varndell. Xb-m: F. Armstrong; Xo-t: C. Tonna. Xu-w: A. Barnes.

WE take this opportunity to thank the judges, G. Barkham, N. Davis, D. Eidlestein, I. Goddard, V. Hunt, D. Jones, J. Stillwell and A. Weaire for their services, and also *Practical Fishkeeping* and *The Aquarist & Pondkeeper* magazines, Messrs. Interpet Ltd., Rosewood Ltd., Peterama Ltd. and Philips Yeast Products Ltd. who gave their support.

* * *

MR. 'Bill' Leach, speaking to **Bristol A.S.** illustrated his remarks with an excellent series of slides of Hong Kong. These naturally included some of the fish farms and of the shops selling Goldfish. These looked more like holding units than anything else. The fish appeared to be put into an aquarium till full, water added and then the aeration turned on. The wonderful views of Hong Kong, the fishy interest, provided a fascinating evening for which the speaker was cordially thanked. Mr. Harper brought in some Eheim pumps for members' closer inspection and he answered many queries. Table Show results: Common Goldfish (19): 1 and 2, A. McDonald; 3, W. Ham; 4, M. Kimberly. Veiltails (9): 1, P. Norman; 2, 3 and 4, J. Day. During the evening a presentation was made to Stan Lloyd, the retiring President, for his services to the Society.

* * *

RESULTS for **North Avon A.S.** open show held 7th May at Hanham Folk Centre, High Street, Hanham, Bristol. The Aquarist Gold Pin for the Best Fish in Show was awarded to Mr. P. Long, for Killifish (Nothobranchius rachovii), also Top Tank Awards for best fish, and a special trophy donated by Mr. Gordon Churchill for best Killifish. Mr. Long is a North Avon member. Top Tank Awards were awarded to Mr. P. Cooke of Nailsea A.S. for both classes: Best Breeder and Best Pair. Severnside Aquarist Association Challenge Trophies for nominated classes were awarded to: Mr. J. Egan (Port Talbot) for Barbs—barbodes. Mr. R. Collier (Swindon) for Sharks—Labeos. Other special trophies were awarded to P. and N. Watts (Highest Individual Points) Mr. D. Spence (Highest Points Club Member) and Droitwich A.S. (Highest Points Visiting Club). Other results were as follows, trophy awarded for 1st in each class: Class 1: 1, P. Taylor; 2 and 3, P. and N. Watts; 4, A. Clipstone. 2: 1 and 2, P. and N. Watts; 3, J. Egan; 4, P. Gadd. 3, 1 and 2, J. Egan; 3, R. Collier; 4, P. Perkins. 4: 1, R. Collier; 2, D. Spence; 3, K. Fellows; 4, Nelder/Bowyer. 5: 1, P. Taylor; 2, C. Curtis; 3, P. and N. Watts. 5a: 1, S. Walters. 6: 1, J. Egan; 2, Mr. and Mrs. Griffiths; 3, D. D. Spence; 4, G. Darby. 7: 1, 2 and 4, Nelder/Bowyer; 3, E. Perkins. 8: 1, A. B. Clipstone; 2, P. Cooke. 9: 1, Nelder/Bowyer; 2 and 4, D. Spence; 3, P. Cooke. 10: 1, Mr. and Mrs. Griffiths; 2, I. Hughes. 11: 1, R. Collier. 12: 1, P. and N. Watts; 2, Mr. and Mrs. Griffiths; 3, E. Perkins; 4, P. Cooke. 13: 1, P. and N. Watts; 2, Mr. and Mrs. Griffiths; 3 and 4, J. Egan. 14: 1, C. Curtis; 2, P. Cooke. 14a: 1 and 2, P. and N. Watts; 3, W. Irving; 4, J. Bridge. 15: 1, I. Hughes; 2, J. Hughes; 3, J. Egan; 4, W. Clipstone. 16: 1, J. Egan; 2, P. Gadd. 17: 1, E. Perkins; 2, P. and N. Watts; 3, Lee Williams; 4, P. Taylor. 17a: 1, P. Gadd. 18: 1, D. Spence; 2, J. Egan; 3, G. Tanner; 4, R. Collier. 19: 1, P. and N. Watts; 2, D. Spence; 3, N. Belcher; 4, A. Clipstone. 21: 1, D. Spence; 2, K. Fellows. 22: 1 and 3, P. Long; 2, Nelder/Bowyer; 4, P. Gadd. 23: 1, P. Cooke; 2, J. Bridge. 24: 1, P. Cooke; 2, Mr. and Mrs. Griffiths; 3, K. Fellows; 4, P. Long. 25: 1, P. Cooke. 26: 1, J. Bridge; 2, P. and N. Watts; 3, J. Bridge; 4, N. Curry. 27: 1 and 4, S. Howells; 2, P. and N. Watts; 3, M. Dibble. 27a: 1, P. Taylor; 2, D. Spence; 3, P. Gadd. 27b: 1 and 3, S. Howells. 28: 1, P. Cooke; 2, K. Fellows; 3, M. English. 29: 1, 2 and 3, M. English; 4, M. Dibble. 30: 1 and 2, R. Cooke; 3, A. Hughes; 4, E. Fellows. 32: 1, P. Gadd. Other Societies in attendance were: British Cichlids Association, Bristol Cavie Society, Southern Counties British Foreign Birds, and Bristol Budgerigars and Foreign Birds. All trophies and cards were presented by Mr. H. C. B. Thomas, President of Severnside Aquarists Association.

SOUTH EAST

THE **Tongham Aquarists'** held a meeting on 3rd March which was very well attended and the show secretary gave a talk on Carps (family Cyprinidae). Mr. M. Long judged the results. Class 8: 1, M. Bird; 2, J. Ottley; 3, R. Cooke. Class 9: 1 and 2, M. Martin; 3, R. Cooke. A.O.V.: 1 and 2, R. Cooke; 3, D. Barnit. The meeting on 17th March was also well attended, the talk was on Rift Valley Cichlids, by Ray Cooke. Show results: Class 8: 1, M. Bird; 2, S. Knott; 3, D. Barnit. Class 19: 1, A. Burges; 2, C. Pearce; 3, M. Martin. A.O.V.: 1, G. Horsen; 2, A. Burges; 3, S. Knott. All meetings are held at the Victoria Hall, Ash Hill Road, Ash. Forthcoming attractions will include talks on Filters, Fish and Nip, Furnished Aquaria and American Cichlids. For further details contact J. Ottley on Aldershot 310862.

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AT the **Reading & District A.S.** meeting on 21 March they had a very successful talk and demonstration on Tank Making by Rod Norris. All Reading members found it very interesting and even had a go themselves. Meetings are held on the 1st and 3rd Monday of each month at the "Crown" Public House, Crown Street, Reading. Any newcomers welcome.

Wycombe Marsh A.S. meets at 8.30 p.m. at the Young Adult Centre, Wycombe College, High Wycombe, Bucks. on the 1st and 3rd Thursdays of the month. Further details from the secretary, Jeff Woodbridge. (Tel: High Wycombe 882875). Events planned include 2nd June, Trip to Pet Care, Thame.

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A FASCINATING talk by member John Gilbert was enjoyed by the **East Kent Aquatic Study Group** at their April meeting. John who is not only an aquarist but also a philatelist, brought along several hundred stamps from his collection, all of which pictured various forms of aquatic life. He was able to explain the origins of the stamps and pointed out some of the mistakes which occur in the art work of such stamps. Pride of his collection are the set of British stamps by local artist A. W. Jardine. Table Show judge was Mr. J. Edwards. He gave tips on the best way to present fish for competition and explained the new rules for permitted show tanks. He awarded place cards to: Class T, A.O.V. Livebearers: 1, 2, 3 and 4, A. Aspital. Class M, A.O.V. Egglayers: 1, D. Bridgeman; 2, M. Boniface; 3, T. Wetzell; 4, G. Neaves.

If you have an interest in fishkeeping why not come to our next meeting at the Memorial Hall, Bellinge, Herne Bay, on the second Tuesday of the month. For details ring Canterbury 52382.

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RESULTS of open show held in April by the **Croydon A.S.** Class Ag: 1 and 2, P. Mills (WDAS); 3, Mrs. J. Tonna (Reading); 4, P. Cox (WDAS). Ba: 1, A. I. Feast (Tonbridge); 2, P. Somers (SELASS); 3, Mr. and Mrs. Brook (Croydon); 4, J. Partt (LTE). Bz: 1, J. Rowney (Bexleyheath); 2, C. Tonna (Reading); 3, P. Whiddett (Tonbridge); 4, Mrs. D. Threbold (East Dulwich). Ca: 1 and 3, Mrs. P. Edwards (East Kent); 2, D. Ford (Bracknell); 4, A. J. Feast. Cb: 1, P. Whiddett; 2, Mrs. D. Winder (East Dulwich); 3, J. Rowney (Bexleyheath); 4, Mrs. P. Edwards. Cz: 1, J. Edwards (East Kent); 2, J. Partt; 3, Mrs. Threbold; 4, B. Hastings (SELASS). Da: 1, C. Smith (East Dulwich); 2, J. Edwards; 3, M. Cardus (Croydon); 4, D. Brooks (Croydon). Db (F.B.A.S. Championship Class): 1, W. Chapman (CADAS); 2, R. Somers (SELASS); 3, A. Fuller (DAS); 4, Judith Owen (Orpington). Dc: 1, D. Ford (Bracknell); 2 and 3, M. Draper (Tonbridge); 4, A. Fuller. Dz: 1, G. Moore (Romford); 2, R. Somers; 3, J. Rowney; 4, D. Ford. Ea: 1 and 2, T. Laughan (Haringey); 3, D. Hume (Tonbridge); 4, W. Chapman (CADAS). E: 1, J. Edwards; 2, R. Scotting (ADAS); 3, Mrs. D. Winder (East Dulwich); 4, I. Feast. F: 1 and 2, J. Owen (Orpington); 3, P. Somers; 4, W. Chapman. G: 1, P. Somers; 2, D. Winder; 3, G. Hicks (Bexleyheath); 4, J. Edwards. Ha: 1, J. Partt; 2, Mr. and Mrs. Brook (Croydon); 3, G. Rowney (Bexleyheath); 4, D. Winder. Hz: 1, G. Hicks (Bexleyheath); 2, B. Hastings; 3, C. Tonna; 4, J. Partt. J: 1 and 3, Mrs. D. Threbold; 2, A. J. Feast; 4, G. Owen. K: 1 and 3, D. Millins (WDAS); 2, Mrs. D. Winder; 4, P. Whiddett (Tonbridge). L: 1, D. Winder; 2, J. Edwards; 3, C. Hogan (East Dulwich); 4, A. I. Feast. Ma: 1, A. I. Feast; 2, P. Somers; 3, G. Hicks; 4, M. Marsh (Romford). M: 1, A. Fuller; 2 and 4, Mrs. D. Winder; 3, P. Mills (WDAS). Nb-m: 1, Mrs. P. Edwards; 2, D. Ridgewell (SLADAS); 3, A. Fuller (DAS); 4, M. Smith (Sunbury). No-t: 1, P. Mills; 2, F. Scarr (East Kent); 3, R. Somers; 4, C. Tonna. O: 1, R. Orr (Sudbury); 2, W. Chapman; 3 and 4, T. Laughlan. P: 1, G. Freeman (Tonbridge); 2, L. London (Tonbridge); 3, P. Somers; 4, R. Orr (Sudbury). Q: 1, J. Partt; 2, G. Owen; 3, M. Marsh (Romford); 4, R. Scotting (ADAS). R: 1, R. Scotting; 2, C. Tonna; 3, M. Marsh; 4, L. London. S: 1, P. Cox; 2, M. Smith; 3, R. Somers; 4, J. Rowney (Bexleyheath). T: 1, B. Cox (Croydon); 2, R. Nurse (Croydon); 3, P.

Mills; 4, C. Tonna. U: 1, L. London; 2 and 3, C. Chisholm (Croydon); 4, P. Mills. V: 1 and 4, S. Grantham (SPASS); 2, Miss V. Cronan (East Dulwich); 3, T. Laughlan; W: 1, J. Taylor (Haringey); 2, G. Owen; 3, P. Whiddett (Tonbridge); 4, Mr. and Mrs. Brook (Croydon). Xb-m: 1, Mr. and Mrs. Brook; 2, F. Scarr (East Kent); 3, M. Smith; 4, D. Ridgewell (SLADAS). Xa-t: 1, C. Tonna; 2, G. Owen; 3, P. Cox; 4, M. Clarke (Bracknell). Za: 1 and 2, Mrs. Grantham; 3 and 4, P. Mills. Amphibians: 1, 2 and 4, S. O'Connor; 3, C. and D. Bridgeman (East Kent). Reptiles: 1, C. W. Atkinson; 2, S. O'Connor; 3, P. Taylor; 4, D. Brooks (Croydon). Best Fish in the Show (Class Dc): Mr. Derek Ford (Bracknell Society). Highest Points obtained by a Lady: Mrs. Doris Winder (Presented with the Ladies Rosebowl). Highest Points gained by Visiting Society: Tonbridge Society (Presented with the Croydon Cup). F.B.A.S. Championship Class (Db): W. Chapman (CADAS). Total entries: 481 fish classes; 8 amphibians; 5 reptiles.

MIDLANDS AND WALES

A GROUP of aquarists who have all been members of various Midland clubs for many years and have all become somewhat disillusioned with the various rules and regulations, and some of the dictatorial attitudes of club members who seem to forget why they join these clubs. Fishkeeping is a hobby and as such should be a relaxation and a visit to the local society should be a pleasure. Consequently they have formed **Willenhall Aquarist Group.** Their aim is to make club nights something to look forward to. They will raise funds and will have rules but they will aim to make fund raising as painless as possible and rules will be limited and flexible. Their basic aim is to further the cause of fishkeeping as a relaxing hobby, and they hope to cater for anyone with anything from a goldfish bowl to a fish house. Old and young are all welcome and they will be forming a junior league with special show classes for them. Details of membership and meetings may be obtained from A. W. Davis, 5 Star Close, Bentley, Walsall. (Tel: 646265).

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Malvern & District A.S. open show results Class A: 1 and 2, Mrs. B. May (Pangbourne); 3, T. Waller (Southend); 4, A. Waller (Southend). Ba: 1, D. and P. Lambert (Halesowen); 2 and 3, G. Crumpton (Bexley Hill); 4, Mr. and Mrs M. Griffiths. Bz: 1 and 3, Mrs. D. Cruickshank (Hendon); 2 and 4, D. A. Waller. C: 1 and 4, J. Egan (Port Talbot); 2, Mr. and Mrs. M. Griffiths; 3, J. T. F. Mayle (Nuneaton). Ca: 1, 2 and 4, A. Waller; 3, P. and N. Watts (Droitwich). Da: 1 and 3, C. Smith (EDAS); 2, J. Egan; 4, P. and N. Watts. Db: 1, C. E. Curtis (Swindon); 2 and 4, K. Shaw (Halesowen Central); 3, G. Crumpton (Halesowen Hill). Dc: 1 and 2, P. and N. Watts; 3, F. May (Pangbourne); 4, C. Smith. Dz: 1, J. Egan; 2 and 4, P. Taylor (North Wilts); 3, Mr. and Mrs. Bishop (Droitwich). E: 1, P. and N. Watts; 2, A. Parsons (MADAS); 3, C. Smith; 4, A. Waller. Ea: 1, Brockhouse Family (Dudley); 2, A. Waller; 3, A. Parsons; 4, Mr. and Mrs. Yallop. F: 1, 2 and 4, G. Crumpton; 3, F. May. Ga: 1, T. Hudson (Halesowen Central); 2, P. and N. Watts; 3, A. Parsons; 4, Mr. and Mrs. Perks (MADAS). Gz: 1, J. T. F. Mayle; 2, Mrs. B. May 3, Onions Family (Dudley); 4, Mrs. D. Cruickshank (Hendon). H: 1, A. Waller; 2, Mr. T. Cruickshank; 3, T. Hudson; 4, J. Egan (Port Talbot). J: 1, G. Hemmings (Nuneaton); 2, A. Waller; 3, Mr. and Mrs. Yallop; 4, D. Killworth (Dudley). K: 1, G. Hemmings; 2 and 3, A. Waller; 4, K. Wheatley (Dudley). L: 1, A. Waller; 2, Griffiths (Halesowen Central); 3, T. Waller; 4, A. Parsons. M: 1, J. T. F. Mayle; 2, Mrs. B. May; 3, Mr. and Mrs. L. Perks 4, D. Killworth. Ma: 1, A. Parsons; 2, R. Hampton (Dudley); 3, P. Johnson (DDAS); 4, Mr. and Mrs. Bishop. N: 1, Mr. D. Cruickshank; 2, J. T. F. Mayle; 3, Onions Family; 4, D. and P. Lambert. O: 1, P. Taylor (North Wilts); 2, 3 and 4, A. Davis (Wolverhampton). P: 1, A. Waller; 2, T. Waller; 3, Mr. and Mrs. Yallop; 4, A. Davis. Q: 1, T. Waller; 2, K. A. Fellowes (Swindon); 3, R. Collier (Swindon); 4, A. Parsons. R: 1, D. and P. Lambert; 2, J. Egan; 3, A. Waller; 4, A. Davis. S: 1, P. Taylor (North Wilts); 2, C. E. Curtis (Swindon); 3, Mr. and Mrs. Yallop; 4, C. Smith. T: 1, J. T. F. Mayle; 2, A. Davis; 3 and 4, D. and P. Lambert. U: 1 and 3, P. and N. Watts; 2, Griffiths Family (Halesowen Central); 4, P. Taylor. V: 1 and 4, T. Hudson; 2, Griffiths Family; 3, P. Taylor. W: 1, T. Cruickshank; 2, P. S. Parsons (Hendon); 3, Mr. and Mrs. Yallop; 4, T. Hudson. X-bm: 1, 2 and 4, P. and N. Watts; 3, Joyce Smith (EDAS). X-or: 1, A. Waller; 3 and 3, J. T. F. Mayle; 4, D. and P. Lambert. Z: 1 and 3, A. Parsons; 2, A. Waller. 4, C. Smith. Mr. S. K. Yallop, Secretary and Open Show Secretary of MADAS, takes this opportunity to thank all who helped and took part in making the Show a success.

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Gloucester A.S. now have a new venue at King's School, Pitt Street, Gloucester (Junior School Art Room). The Club meet at 8 p.m. on the first Tuesday of each month (with the exception of August when there is no meeting). The Club covers both coldwater and tropical fishkeeping. New and past members extremely welcome.

NORTH

RESULTS of **Stretford and District A.S.** open show, held on 1st May, at Humphrey Park Community Centre, Humphrey Lane, Urmston, Manchester. The Best Fish in Show was a Polypterus with 81 points, owned by Mr. and Mrs. Baldwin (Sandgrounders). Guppies: 1, S. Whiting (North Staffs); 2, M. Daniels (Blackpool); 3, J. Yates (Ind.). Platies: 1, Mr. and Mrs. Marshall (Merseyside); 2, D. T. Armour (Ellesmere Port); 3, S. Whiting. Swordtails: 1, Mr. and Mrs. Baldwin; 2, A. Chadwick (Oldham); 3, Mr. and Mrs. Marshall. Mollies: 1 and 2, J. Yates (Ind.); 3, A. Rowbotham (Macclesfield). A.O.V. Livebearers: 1, Mr. and Mrs. Goddard (Macclesfield) Section Winner; 2 and 3, J. and K. Corbett (Merseyside). Small Anabantids: 1, D. T. Milner (Darwen) Section Winner; 2, R. I. Payne (Merseyside); 3, Mr. and Mrs. Bibby (Sandgrounders). Large Anabantids: 1, M. and D. Hartly (Sandgrounders); 2, S. Lavender (Stretford); 3, D. T. Armour (Ellesmere Port). Fighters: 1, M. Daniels (Blackpool); 2, R. I. Payne (Merseyside); 3, Mr. and Mrs. Marshall. Small Barbs: 1, D. T. Milner (Darwen) Section Winner; 2, Mr. and Mrs. Marshall; 3, B. Parr (Oldham). Large Barbs: 1, Mr. and Mrs. Baldwin; 2, J. Lynch (Merseyside); 3, Mr. and Mrs. Whittaker (Sandgrounders). Small Characins: 1, D. T. Milner (Darwen); 2, Mr. and Mrs. Bibby (Sandgrounders); 3, Mr. and Mrs. Baldwin. Large Characins: 1, Mr. and Mrs. Eatough (Sandgrounders) Section Winner; 2, R. I. Payne; 3, B. Parr (Oldham). Small Cichlids: 1, Mr. and Mrs. Baldwin Section Winner; 2, A. and C. Leebetter (Stretford); 3, J. Lynch. Large Cichlids: 1, Mr. and Mrs. Bibby (Sandgrounders); 2, Mr. Pritchard (St. Helens); 3, Mr. Hartly (Sandgrounders). Rift Valley Cichlids: 1, Mr. and Mrs. Eatough; 2 and 3, Mr. and Mrs. Williams (Ellesmere Port). Angels and Discus: 1, 2 and 3, P. Glover (Ellesmere Port). Corydoras and Brochis: 1 and 2 Mr. and Mrs. Baldwin; 3, J. T. Morris (Sandgrounders). A.O.V. Catfish: 1, 2 and 3, J. T. Morris Section Winner. Loaches and Botias: 1 and 2, Mr. and Mrs. Baldwin; 3, Mr. and Mrs. Bibby. Killifish Top Spawning: 1 and 2, D. Parkinson (St. Helens) Section Winner. Killifish Bottom Spawning: 1, D. Parkinson. Rasboras, Danios and Minnows: 1, Mr. and Mrs. Baldwin Section Winner; 2 and 3, A. M. Redman (Blackpool). Sharks and Foxes: 1, Mr. and Mrs. Baldwin; 2, Mrs. Price (Ellesmere Port); 3, R. I. Payne. A.O.V. Tropical: 1, Mr. and Mrs. Baldwin; 2, M. Davies (Ellesmere Port); 3, M. and D. Hartly. Pairs (Livebearers): 1, J. and K. Corbett (Merseyside) Section Winner; 2, Mr. and Mrs. Marshall; 3, J. and K. Corbett. Pairs (Egglayers): 1 and 2, J. T. Morris (Sandgrounders); 3, B. Parr. Breeders (Livebearers) 3 and 4: 1, J. Lynch (Merseyside); 2, Mr. and Mrs. Marshall; 3, P. Johnson (Stretford). Breeders (Egglayers) 1 and 2: 1, J. T. Morris (Sandgrounders) Section Winner; 2, B. Dainton (YCSG); 3, R. I. Payne. Breeders (Egglayers) 3 and 4: 1, D. T. Milner (Darwen); 2, J. T. Morris; 3, Mr. and Mrs. Marshall. Single Tail Goldfish: 1, Mr. and Mrs. Bibby; 2, R. and D. Parr (Oldham); 3, Mr. and Mrs. Colley (Oldham). Twin Tail Goldfish: 1, Mr. and Mrs. Bibby; 2, Mr. and Mrs. Colley (Oldham); 3, J. and S. Crosswell (Preston). A.O.V. Coldwater: 1, Mr. and Mrs. Baldwin Section Winner. Furnished Mini-Tanks: 1, 2 and 3, D. T. Milner (Darwen) Section Winner. Juniors: 1, G. Hoey (Stretford); 2, V. Kenyon (Stretford); 3, G. Cummins (Stretford).

S.&D.A.S. would like to thank all those who contributed to make this a successful event.

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Bishop Auckland A.S. held their annual open show at the Barrington School, Bishop Auckland on 10th April. Winners were as follows: Class Ba: 1, J. McCutheon (Gateshead); 2, 3 and 4, D. Clark (Hexam). Bz: 1, Mr. and Mrs. Roe (Bp. Auck.); 2, J. Middlemast (Stanley); 3, J. McCutheon; 4, R. Atkinson (Anfield Plain). Ca: 1, R. and A. Johnson (Piscene); 2, T. Sayers (Stanley); 3, A. Bell (Gateshead); 4, R. Howard (Cast Urfa). Cz: 1 and 2, J. Middlemast; 3, G. Hunt (Novos); 4, R. Cutler (Newton Aycliffe). Da: 1 and 2, D. Morgan (Newton Aycliffe); 3, L. Burdus (Hexham); 4, Mr. and Mrs. Zamir (Bp. Auck.). Db: 1, D. P. Robson (Darlington); 2, Mr. and Mrs. Rodway (Darlington); 3, J. and L. Wilson (Redcar); 4, Mr. and Mrs. Clark (Sunderland). Dc: 1, Mr. and Mrs. Roe; 2, Mr. and Mrs. Gowland (N. Aycliffe); 3, C. Marsh (N. Aycliffe); 4, D. P. Robson. Dz: 1, S. D. Smith (Hartlepool); 2, Mr. and Mrs. Gowland; 3, G. Errington (Stanley); 4, W. N. Freeman (Houghton). Ea: 1 and 3, J. and L. Wilson; 2, G. R. Sayers; 4, Mr. and Mrs. Roe. Ez: 1, R. and A. Johnson (Piscene); 2, R. Cutler (Aycliffe); 3, E. and L. Williams (Hartlepool); 4, J. Brady (Bimbi). F: 1 and 3, H. Lake (Stanley); 2, P. Riley (Stockton); 4, Mr. and Mrs. Clark. G: 1, S. D. Smith; 2, Mr. and Mrs. Clark; 3, A. Scott (Bp. Auck.); 4, A. V. Brown (Bp. Auck.). H: 1, S. Kelly (Aycliffe); 2, P. Riley (Stockton); 3, G. A. Chapman (Darlington); 4, R. A. Johnson. J: 1, L. Burdus (Hexham); 2, R. Brogden (Bp. Auck.); 3, D. Russell (Stanley); 4, A. Richardson (Gateshead). K: 1, L. Burdus; 2, Mr. and Mrs. Roe; 3, R. Atkinson; 4, Mr. and Mrs. Clark. L: 1, E. and L. Williams (Hartlepool); 2, J. Brady (Bimbi); 3, R. Atkinson; 4, J. and P. Duffhill (Redcar). Ma: 1, A. Brown (Bp. Auck.); 2, S. D. Smith (Hartlepool); 3, D. Morgan (Aycliffe); 4, J. and L. Wilson. Mz: 1, D. Hall (Aycliffe); 2, J. Brady; 3, Mr. and Mrs. Gowland (Aycliffe); 4, Mr. and Mrs. Clark. Nb-m: 1, J. Middlemast (Stanley); 2, R. and A. Johnson; 3, D. Morgan; 4, D. Hodgson (Stanley). Na-t: 1 and 2, M. Hepton (Sunderland); 3, Mr. and Mrs. Redway (Darlington); 4, T. Ogden (Bimbi). O: 1, H. Lake (Stanley); 2, E. and L. Williams; 3, G. and L. Potts (Sunderland); 4, Mr. and Mrs. Rodway. P: 1, M. Hepton; 2, G. and L. Potts (Sunderland); 3, J. Brady; 4, H. Lake. Q: 1, S. D. Smith; 2, S. Kelly (Aycliffe); 3, F. Wade (Aycliffe); 4, R. Brogden (Bp. Auck.). R: 1, D. Hodgson (Stanley); 2, T. Sayers (Stanley); 3 and 4, F. Parker (Redcar). S: 1, M. Hepton; 2, S. Kendall (Anfield Plain); 3, E. and L. Williams; 4, W. N. Freeman (Houghton). T: 1, M. Hepton; 2, G. A. Chapman (Darlington); 3, S. D. Smith; 4, Mr. and Mrs. Rodway. U: 1 and 2, Mr. and

Mrs. Roe; 3 and 4, R. Elliott. V: 1 and 4, D. Clark (Heatham); 2 and 3, K. Dodd (Bp. Auck.). W: 1, G. Hunt (Novos); 2, D. Clark; 3, Mr. and Mrs. Roe. Xbn: 1, M. Hepton; 2, G. A. Chapman; 3, H. Lake; 4, A. Brown (Bp. Auck.). Xn+: 1, H. Lake; 2 and 3, G. A. Chapman; 4, Mr. and Mrs. Burrows (Bp. Auck.). Y: 1, 2 and 3, W. Taylor (Novos); 4, S. Wilson (Redcar). Best Breeders: M. Hepton (Sunderland). Best Pairs: M. Hepton. Best in Show: J. Middlemast, Class Cl. Best Society: 1, Stanley (46 points); 2, Bishop Auckland (43); 3, Newton Aycliffe (36).

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RESULTS of Macclesfield Aquarium Society open show held on 8th May. From an entry of 315 fishes, the Best Fish in Show was a A.O.V. Livebearer, Characodon lateralis, owned by J. and K. Corbett of Merseyside Society. The FNAS Society with the most points was Sandgrounders Society, 2nd Macclesfield and joint 3rd Merseyside and Darwen. Macclesfield Aquarium Society would like to thank every society that made the effort to attend to make the show the success that it was. We would also like to take this opportunity to inform everyone of a change of club meeting venue to the Commercial Hotel, Brook Street, Macclesfield on the last Wednesday in every month. Guppies: 1, Mr. and Mrs. Daniels (B/P); 2, G. Janion (R/Corn); 3, M. A. Daniels (B/P). Platies: 1, J. Kidd (Macc.); 2, Mrs. C. McDonald (S/G); 3, S. Whiting (N/S). Swordtails: 1, Mr. and Mrs. Baldwin (S/G); 2 and 3, S. Whiting. Mollies: 1, Mr. A. Rowbotham (Macc.); 2, Mrs. P. Hazlehurst (S/G); 3, Mr. and Mrs. Daniels (B/P). A.O.V. Livebearers: 1 and 3, J. and K. Corbett (M/S); 2, Mr. and Mrs. Goddard (Macc.). Small Anabantids (up to 6 cm.): 1, D. T. Milner (Darwen); 2, S. and A. Graham (B/well); 3, M. and D. Hartley (S/G). Large Anabantids (over 6 cm.): 1, Mr. and Mrs. Baldwin; 2 and 3, M. and D. Hartley (S/G). Fighters: 1, C. A. Daniels (B/P); 2, J. Kidd (Macc.); 3, M. A. Daniels (B/P). Small Cichlids (up to 10 cm): 1, Mr. and Mrs. Baldwin; 2, P. and S. Spencer (P/ton); 3, J. and S. Cresswell (P/ton). Large Cichlids (over 10 cm): 1, Mr. and Mrs. Bibby (S/G); 2, Mr. and Mrs. Pritchard (St. H); 3, P. and S. Spencer. Angels: 1, P. and S. Spencer; 2, Mr. and Mrs. Stevenson (Old); 3, T. W. Steel (B/Well). Rift Valley: 1, Mr. and Mrs. Eatough (S/G); 2 and 3, Mr. and Mrs. Waterhouse (M/S). Small Barbs (up to 7.5 cm): 1, D. T. Milner; 2, J. Kidd (Macc); 3, S. Whiting. Large Barbs (over 7.5 cm): 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Whittaker (S/G); 3, Mr. and Mrs. Daniels. Small Characins (up to 5 cm): 1, S. and A. Graham (B/Well); 2, J. Cook (Buxton); 3, D. T. Milner. Medium Characins (up to 12 cm): 1 and 2, Mr. and Mrs. Eatough; 3, Mr. and Mrs. Bibby (S/G). Large Characins (over 12 cm): 1, Mr. and Mrs. Daniels (B/P); 2, Mr. and Mrs. Mulla (M/S). Toothcarp (Top Spawning): 1, M. Agnew (Buxton); 2, D. Parkinson (St. H); 3, S. Tomlinson (Macc). Toothcarp (Bottom Spawning): 1 and 3, M. Agnew; 2, S. Tomlinson (Macc). Minnows: 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. A. Goddard (Macc); 3, D. T. Milner. Danios: 1, Mr. and Mrs. Baldwin; 2, P. and S. Spencer; 3, A. Rowbotham (Macc). Rasboras: 1, D. T. Milner; 2, Mr. and Mrs. Baldwin; 3, A. M. Redman (B/P). Corydoras and Brochis: 1 and 3, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Waterhouse (M/S). A.O.V. Catfish: 1 and 3, J. T. Morris (S/G); 2, Mr. and Mrs. Waterhouse. Loaches: 1, Mr. and Mrs. Bibby (S/G); 2, Mr. and Mrs. Stevenson (Old); 3, Mr. and Mrs. Baldwin. Sharks: 1, Mr. and Mrs. Baldwin; 2, T. W. Steel (B/well); 3, Mr. and Mrs. Eatough. Flying Foxes: 1, Mr. and Mrs. Stevenson (Old); 2, Mr. and Mrs. Edwards (B/well); 3, D. T. Milner. Breeders (Egglayers): A & B: 1 and 3, J. T. Morris (S/G); 2, D. T. Milner. Breeders (Egglayers) C & D: 1 and 2, D. T. Milner; 3, J. T. Morris (S/G). Breeders (Livebearers) C & D: 1, J. and K. Corbett (M/S); 2, T. W. Steel (B/well). True Pairs (Egglayers): 1, J. T. Morris (S/G); 2, Mr. and Mrs. Baldwin; 3, M. and D. Hartley. True Pairs (Livebearers): 1, Mr. and Mrs. Baldwin; 2 and 3, J. and K. Corbett (M/S). A.O.V.: 1, M. Alcock (B/well); 2, Mr. and Mrs. Pritchard (St. H); 3, M. and D. Hartley. Goldfish and Comets: 1, Mr. and Mrs. Bibby (S/G); 2, Mr. and Mrs. Colley (Old); 3, C. A. Daniels (B/P). Shubunkins: 1, J. and S. Cresswell (P/ton); 2, D. Middleton (Buxton); 3, Mr. and Mrs. Stevenson (Old). Moors: 1, 2 and 3, Mr. and Mrs. Finney (Macc). Fantail: 1, Mr. and Mrs. Bibby (S/G); 2, Miss L. Finney (Macc); 3, Mr. and Mrs. Finney. A.O.V. Fancy Goldfish: 1, Mr. and Mrs. Colley (Old); 2 and 3, Mr. and Mrs. Finney. A.O.V. Coldwater: 1, Mr. and Mrs. Baldwin; 2, Mr. and Mrs. Colley; 3, D. Parkinson (St. H).

Key (B/P), Blackpool; (R/Corn), Runcorn; (Macc), Macclesfield; (S/G), Sandgrounders; (N/S), North Staffs; (M/S), Merseyside; (B/well), Bradwell; (P/ton), Preston; (St. H), St. Helens; (Old), Oldham.

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OFFICERS elected for 1983 to the **Rothwell A.S.**: Chairman, L. Nicholson; Secretary, S. Ryan, 86 Sandway, Leeds 15; Treasurer, D. Clark; Show Secretary, E. Whitham; Committee members: Mrs. S. Nicholson, S. Aldred. R.A.S. meetings are held every 2nd and 4th Wednesday of the month, at Carlton Working Men's Club, 8 p.m. For further details phone Leeds 821208 or 646017.

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RESULTS of the Hull A.S. open show, held at the Shire Hall, Howden. Guppy: 1, R. Haggan (Ebor); 2, Mr. and Mrs. Pickford (HCAG); 3, J. Edwards (Ind.). Sword: 1, M. Fawcett (York); 2, Mr. Littlewood (Withernsea); 3, D. Barrett (BBC). Platty: 1, D. Barrett; 2, S. Taylor (Wyke); 3, B. Sharp (Bradford). Molly: 1, D. Barrett; 2, G. A. Todd (Hull); 3, J. Edwards. A.O.V. (Livebearer): 1, D. Barrett; 2, S. Taylor; 3, Andrew Littlewood (Darfield). Loaches: 1, Mr. and Mrs. Cutts (Grimethorpe); 2, Mr. and Mrs. P. Hovell (A&D); 3, Mr. and Mrs. J. Riley (Leeds P.O.). Sharks and Fvnes: 1 and 2, Mr. and Mrs. P. Hovell; 3, R. Beall (Huddersfield). A.O.V.: 1, Mr. and Mrs. Cutts; 2, Mr. and Mrs. P. Hovell; 3, A. Taylor. A.V. Female (Egg): 1, Mr. and Mrs. Lake (Grimsby and Cleethorpes); 2, Mr. and Mrs. J. Riley; 3, Mr. and Mrs. Silk (SJS). Pairs (Egg): 1 and 2, Mr. and Mrs. Lake; 3, D. Andrews (Wyke). Breeder (Egg) 1 and 2: 1, D. Farrand (Bridlington); 2, R. Beall; 3, Brian Todd (Grimsby). Mins. and Dans: 1 and 3, Mr. and Mrs. Lake; 2, G. Clarke (BBC). Rasboras: 1, Mr. and Mrs. P. Hovell; 2 and 3, Mr. and Mrs. Lake. Barbs (up to 10 cms): 1 Mr. and Mrs. J. Riley; 2, C. Calvert (York); G. and D. Kenning (Ind.). Barbs (over 10 cms): 1, Mr. and Mrs. P. Hovell; 2 and 3, M. H. Smith. A.O.V. Cats.: 1, Mr. and Mrs. P. Hovell; 2, M. H. Smith; 3, Mr. and Mrs. J. Riley. Angels: 1, C. Calvert; 2, Mr. and Mrs. Johnson (L and E. Louth); 3, Mr. and Mrs. P. Hovell. A.O.V. Cichlids (up to 10 cms): 1 and 2, Mr. and Mrs. J. Riley; 3, M. Cook (Wyke). A.O.V. Cichlids (over 10 cms): 1, L. Barker (Wyke); 2, G. and D. Kenning (Ind.); 3, R. Haggan (Ebor). Rift Valley: 1, Mr. and Mrs. Lake; 2, S. H. Shield (Ebor); 3, G. and D. Kenning. Characins (up to 7 cms): 1 and 2, Mr. and Mrs. Lake; 3, Mrs. L. Pearson (Grimsby and Cleethorpes). Characins (over 7 cms): 1, Mr. and Mrs. P. Hovell; 2, Mrs. Anderson (Wyke); 3, L. Barker. Breeder (Egg) 3 and 4: 1, M. Fawcett (York); 2, S. H. Shield; 3, Mr. and Mrs. Brackenbury (HCAG). Common and Comet Goldfish: 1, Mr. and Mrs. Silk; 2, Mr. and Mrs. K. Allard (A&D); 3, Mr. and Mrs. Cutts. Fancy Goldfish: 1 and 2, Mr. and Mrs. Silk. A.O.V. Coldwater: 1, Mr. and Mrs. Silk; 2, R. Haggan (Ebor); 3, C. Calvert. Fighters: 1, Mr. and Mrs. Brackenbury; 2, D. Sharp; 3, M. Fawcett (York). Anabantids (up to 10 cms): 1, Mrs. Anderson (Wyke); 2, Mr. Lawton (Wyke); 3, Mr. and Mrs. P. Hovell. Anabantids (over 10 cms): 1 and 2, Mr. and Mrs. P. Hovell; 3, Mr. and Mrs. Pickford (HCAG). Egglaying Toothcarps: 1, D. Andrews (Wyke); 2, Mr. and Mrs. Lake; 3, R. Willerton (Hull). Corydoras: 1, G. and D. Kenning (Ind.); 2, Mr. and Mrs. Campbell (Harrogate); 3, Mr. and Mrs. J. Riley. A.V. Female (Livebearer): 1, D. Barrett; 2 and 3, Mr. and Mrs. Silk. Pairs (Livebearer): 1, D. Barrett; 2, S. Taylor (Wyke); 3, S. Wilson (BBC). Breeders (Livebearer) 1 and 2: 1, Mrs. Anderson (Wyke); 2, M. Fawcett; 3, S. Wilson. Breeders (Livebearer) 3 and 4: 1, Mr. and Mrs. Pickford; 2, M. Fawcett; 3, Mrs. Anderson. Best Fish in Show: D. Barrett (BBC). Best Exhibit in Show: Mr. and Mrs. D. Farrand (Bridlington).

SCOTLAND

THE **Paisley & District A.S.** held a meeting on 5th April, with its annual auction and quiz competition. The tableshow comprised Labyrinths and the results: 1, Three Spot Gourami, Ian Lindsay; 2, Golden Gourami, Evelyn Lindsay; 3, Dwarf Gourami, J. McGann; 4, Three Spot Gourami, Evelyn Lindsay. Meetings are held on the first Tuesday of every month at the Paisley Museum & Art Galleries, High Street, Paisley at 7.15 p.m. to 9.15 p.m. Everyone welcome; further information can be obtained from the Club Secretary, Mrs. E. Lindsay, 71 Wright Street, Renfrew PA4 8AS. (Tel: 041-889 5772).

Dates for the diary

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

JUNE

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

5th June 1983: SUDBURY A.S. 11th open show at Nearden High School, Quainton Street, Neasden, NW10. Further details from Barry Wittaridge (tel: 01-450 6745).

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

5th June: ARBROATH A.S. open show in the Community Centre Mackergate, Arbroath. Details from Show Manager, John Steven, 95 Brechin Road, Arbroath.

5th June: MID-SUSSEX A.S. open show, at Sidney West Sports Centre, Leylands Road, Burgess Hill, Sussex. Schedules from A. Fall, 7 Fairford Close, Oathall Road, Haywards Heath, Sussex. (H/Heath 453492) F.B.A.S. Championship Class "B" (Platies).

5th June: REDCAR A.S. open show, Redcar Racecourse. Enquiries: Mr. Duffill. Telephone: Redcar 475838.

5th June: The **SOUTH EAST A.S.** are inviting you to come along to their Bring and Buy which is being held at the "Reverre," Hampton Football Grounds, Beaver Close, Station Road, Hampton, Middlesex, starting at 8 p.m.

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

11th June: LLANTWIT MAJOR A.S. open show at the School Hall, Ham Lane, Llantwit Major, South Glamorgan. Further details from the Secretary, Mr. J. Baker, 79 Bishopswood, Brackla, Bridgend, Mid. Glam. (Tel: Bridgend 68258).

12th June: NORTHWICH & DISTRICT A.S. open show at Hartford High School, Greenbank Lane, Chester Road, Northwich, Cheshire, details from Show Secretary, D. Valentine, 43, Hartford Road, Davenham, Northwich, Cheshire. (Tel: Northwich 66241).

12th June: DUNMOW & DISTRICT A.S. open show at the Foakes Hall, High Street, Dunmow, Essex.

12th June: D.D.A.S. open show. Show Secretary: Mr. D. Perry, 5 Randal Close, Gt. Dunmow, Essex. (Tel: Gt. Dunmow 2601).

12th June: GATESHEAD A.S. 2nd annual open show at Gateshead Leisure Centre, Alexander Road, Gateshead, Tyne and Wear. Benching, 12 to 2; judging, 2.15. Details J. McCutcheon, 2 Lyndhurst Drive, Low Fell, Gateshead NE9 6BB.

18th June: CORRINGHAM & DISTRICT A.S. closed show, run in conjunction with a fishkeeping exhibition open to the public.

19th June: EAST DULWICH A.S. open show at Painley Community Hall, Stopford Road, Walworth, London SE17. Enquiries to: Mrs. D. L. Winder, Show Secretary, 32 Biddystone Road, Brockley, London SE4 2DE.

18th June: SOUTH PARK AQUATIC (STUDY) SOCIETY Fish and Plant open show at Wimbledon Community Centre, St. George's Road, SW19. Show Secretary: Mrs. L. Gray, 10 Ridge Road, Sutton, Surrey SM3 9LJ. Tel: 01-644 3771.

19th June: BASINGSTOKE & DISTRICT A.S. 25th open show at the Carnival Hall, Basingstoke. Schedules from Show Secretary, M. Strange, 10 Loddon Court, Neville Close, Basingstoke. (Tel: Bas. 67039).

19th June: ALFRETON & DISTRICT A.S. open show at Alfreton Hall, Alfreton, Derbyshire. For further details contact M. Darrington, 48 Pennine Avenue, Riddings, Derbyshire: (0773 602077).

19th June: SOUTHERN LIVEBEARER AQUATIC GROUP 2nd All Livebearer open show to be held at the Carnival Hall, Basingstoke. Schedules from M. Strange, 10 Loddon Court, Neville Close, Basingstoke RG21 3HJ. (Tel: 0256 67039).

19th June: S.M.T. A.S. & CLYDE A.C. annual open show at Murray Hall, The Murray, East Kilbride.

25th June: TONGHAM AQUARISTS open show. For schedules and information contact Show Secretary, Mark Mitchell, 12 Ash Church Road, Ash, Aldershot, Hants.

25th June: PORT TALBOT & DISTRICT A.S. 13th annual open show at the Talbach Youth Centre, Port Talbot. Details from John Egan, 47 Beverley Street, Port Talbot, West Glam., S. Wales SA13 1EB. (S.a.e. please).

26th June: THE BRITISH KOI KEEPERS SOCIETY 8th National Show—Koi '83, at Billing Aquadrome, Little Billing, Northampton, Northants, 11.00 a.m. till 5.00 p.m. Further details from: Show Secretary 85, Finedon Street, Burton Latimer (Nr. Kettering), Northants.

26th June: ST HELENS A.S. annual open show, Rainhill Village, Rainhill, Nr. Liverpool. Further details from Mrs. H. Steadman, 10 Ribble Avenue, Rainhill, Liverpool L35 0NJ.

26th June: STROOD & DISTRICT A.S. open show at Springhead Hall, Springhead Road, Northfleet, Kent.

JULY

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

3rd July: CHARD & DISTRICT A.S. open show at Furham School, Chard. Further details from D. Shepherd, 30 Forton Road, Chard. (Tel: Chard 3985).

3rd July: LYTHAM AQUARIST SOCIETY annual open fish show at Ansdell Institute, Woodlands Road, Ansdell, Lytham St. Annes, Lancs. Schedules available from Peter Ham, Show Secretary, 1 Wyndene Grove, Freckleton, Preston, PR4 1DE. (Tel: Freckleton 633182 or 635221).

10th July: DUDLEY & DISTRICT A.S. 2nd open show at the Blind Institute, Wolverhampton Road, Sedgley, West Midlands. For further information contact Show Secretary, K. Wheatley, c/o. 36 Westgate, Lion Farm Estate, Oldbury, Warley, West Midlands B69 1BA or ring G. Brookhouse (Sedgley 77649).

10th July: BILLINGHAM A.S. open show, Billingham Community Centre, Billingham. Schedules from Mr. G. McGregor, 59 Cleadon Avenue, Billingham or Mr. D. Readman, 1 Lovat Avenue, Redcar, Cleveland. (Please enclose s.a.e.).

10th July: SCARBOROUGH & DISTRICT A.S. open show at Friarage County Primary School, Longwestgate, Scarborough. Further details from Mrs. G. Gray, 112 Osgodby Lane, Scarborough.

17th July: SANDGROUNDERS A.S. open show at Meals Cop School, Meals Cop Road, Southport. Show Secretary, Bernie Baldwin, 19 Olive Grove, Southport, Merseyside PR8 6BG. Tel: 0704 43384.

AUGUST

6th August: NORTHERN GOLDFISH AND PONDKEEPERS SOCIETY 7th open show at the Sports Centre, Silverwell Street, Bolton, Greater Manchester. Details and entry forms from R. Hodgkinson, 9 Stratford Close, Farnworth, Bolton BL4 0LZ. S.a.e. with application please. (Tel: 0204 75281).

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

6th & 7th August: LF.A.S. annual open show in Bangor Leisure Centre, Bangor, N.I. Contact: J. Lynde, 26 Grays Park Avenue, Belvoir Estate, Belfast, N.I.

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

7th August: LEICESTER A.S. third open show at St. Matthew's Community Centre, Malabar Road, Leicester. All enquiries for schedules and further information to Show Secretary, J. Richards, 26 Haggett Close, Rushey Mead, Leicester. (Tel: Leicester 666314).

13th August: WESTON A.S. second open show at the Emmanuel Church Centre, Oxford Street, Weston-super-Mare, Avon. Benching will take place between 10.30 a.m. and 12.30 p.m. Doors open to public from 1.0 p.m. until 5.0 p.m.

14th August: DORCHESTER TROPICAL FISH SOCIETY 3rd open show at the Boys Brigade Hall, Sawmills Lane, Weymouth Avenue, Dorchester, Dorset. Schedules from Mr. B. Symes, 3 Arnhem Green, Poundbury, Dorchester, Dorset or phone Dorchester 67557.

14th August: GRIMSBY AND CLEETHORPES A.S. at the T.A. Centre, Westward Ho, off Bargate, Grimsby, South Humberside.

14th August: PRESTON & DISTRICT A.S. 1st open show at Preston North End Supporters Club, Deepdale Road, Preston. Enquiries to: Mr. W. Rawlinson, 364 St. George's Road, Preston (Show Secretary).

20th-21st August: YORKSHIRE AQUARISTS FESTIVAL. Doncaster Racecourse. Details from Mr. N. Bolben, 11 Sherburngate Drive, Pocklington, Yorkshire. Tel: 07592 3177.

28th August: LONG EATON A.S. open show in Gregory's Rose Gardens, Toton.

28th August: NUNEATON AQUARIUM SOCIETY open M.A.L. show at the Trinity Centre, Attleborough Road, Nuneaton.

SEPTEMBER

4th September: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Soham at the home of Mr. P. E. Jarvis. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

4th September: SALISBURY & DISTRICT A.S. open show at the Activity Centre, Wilton Road, Salisbury. Schedules and further information from Mr. D. Eidelstein, 33 Somerset Road, Salisbury. (Tel: 0722 26219).

4th September: ANNFIELD AQUARIST ASSOCIATION open show. New Venue Leadgate Cricket Ground, Near Consett. Further information from secretary Mrs. E. Ebbleton, Annfield Aquatics, Front, St. Annfield Plain, Co. Durham.

4th September: WELLINGBOROUGH & DISTRICT A.S. open show at Westfield School for Boys, Brickhill Road, Wellingborough, Northants. Further information from Andrew Barton, 86 Rocheway, Wellingborough, Northants NN8 3YE. (Tel: Wellingborough 675862).

10th September: BRISTOL A.S. coldwater fish show at St. Ambrose Church Hall, Stretford Road, Whitehall, Bristol. Details and Schedules from the Show Secretary, I. Milden, 67, St. John's Lane, Bristol BS3 5AB. (Tel: 0272-712383).

10th September: HOUNSLOW & DISTRICT A.S. open show at the Hounslow Youth Centre, Kingsley Road, Hounslow. Details from show secretary, T. Bolinbroke, 2 Holmewood Close, Addlestone, Surrey (telephone: Weybridge 54976).

11th September: LEAMINGTON & DISTRICT open show.

11th September: DUNFERMLINE & DISTRICT A.S. annual open show at Netherton Institute, Dunfermline. Any Enquiries, Telephone Mr. Derek Long, Inverkeithing (413275).

11th September: HUDDERSFIELD TROPICAL FISH SOCIETY annual open show at Slaithwaite Civic Hall, Slaithwaite, Huddersfield.

17th September: KINGSTON & DISTRICT open show at Raynes Park Methodist Church Hall, Worple Road, Raynes Park S.W.20.

17th-18th September: EAST KENT AQUATIC STUDY GROUP 4th Annual Exhibition of Fishkeeping at the Village Hall, Littlebourne, Canterbury.

18th September: NORTHAMPTON & DISTRICT A.S. open show at the Gladstone Centre, Gladstone Road, Northampton.

18th September: CHESTERFIELD AND DISTRICT A.S. open show at Westfield Upper School, Mosborough, Sheffield. Schedules from A. Joyce, show Secretary, 27 Darcy Road, Eckington, Sheffield S31 9BN.

18th September: NORTH WILTS A.S. open show. For further information contact Mrs. J. A. Quinn, 9 Netherton Close, Park South, Swindon, Wilts. SN3 2AN.

OCTOBER

2nd October: The Norwich Section of the **BRITISH KOI KEEPERS' SOCIETY** monthly meeting in Norwich at the home of K. J. Allen. For further details contact the Secretary, Mrs. O. Crosby on Norwich 412095.

2nd October: SUNDERLAND A.S. 1st open show at Pennywell Community Centre, Sunderland. Schedules can be obtained from the Show Secretary, Mrs. M. Hepton, 3 Hume Street, Millfield, Sunderland, Tyne and Wear SR4 6HU.

2nd October: A & D FISHKEEPERS 3rd open show at the Hillocks Social Services Centre, Sutton in Ashfield.

9th October: READING & DISTRICT A.S. open show at the Youth Club in Northumberland Avenue, Reading. Schedules from chairman, C. Tonna, 51a Shirley Avenue, Reading.

9th October: BETHNAL GREEN & INDEPENDENT A.S. 3rd open show at Windsor Road School, Manor Way, East Ham, London E6 4ED. Benching from 9.30 p.m., Saturday, 8th October to 11.30 a.m. Sunday, 9th October. Schedules and further information from Mr. and Mrs. B. Rendell, 18 Tilbury Road, East Ham, London E6 4ED. (Tel: (0)472 7981).

16th October: BEXLEYHEATH & DISTRICT A.S. open show at Lessnessheath Primary School, Belvedere, Kent. Further details from Show Secretary, John Rowney (Tel: 01-304 5756).

18th October: BRACKNELL A.S. open show at Prestwood Community Centre, Prestwood, Bracknell, Berkshire. Show Secretary: S. Barnes (Bracknell 0344 50481); Assistant Show Secretary, C. Kaye (Bracknell 0344 53296).