JANUARY 1976 25p

Pet Fish

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In This Issue

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Comments and Quotes

● New licensing provisions for imported fishes

Importers' Licences

FROM 1st January this year, Department of the Environment (DOE) licences are required before some species of fishes, considered to be in need of protection, can be imported. For the eight fishes in 'List A species' (the endangered list) licences are not issued at all if importation is 'for primarily commercial purposes': *Acipenser brevirostrum, Acipenser oxyrhynchus, Scleropages formosus, Coregonus alpenae, Chasmistes cujus, Probarbus jullieni, Pangasianodon gigas, Stizostedion vitreum glaucum.* Licences to import the 15 fishes in 'List B species' (the list of vulnerable species) will be issued on application and are necessary to expedite clearance through Customs: *Acipenser fulvescens, Acipenser sturio, Arapaima gigas, Salmo chrysogaster, Stenodus leucichthys leucichthys, Plagopterus argentissimus, Ptychocheilus lucius, Cynolebias constanciae, Cynolebias marmoratus, Cynolebias minimus, Cynolebias opalescens, Cynolebias splendens, Xiphophorus couchianus, Latimeria chalumnae, Neoceratodus forsteri.* As the controls refer to named species rather than to all members of whole families fewer fish imports will be affected than seemed likely at an earlier stage, and it can be seen from the above that few of the names are of species sought after by aquarists. As a result of the introduction of the new licensing system animals of non-endangered species will no longer require import licences.

On the subject of importation of coldwater fishes, one of our contributors put forward his rather strong view in the November 1975 issue that if (largely for reasons of disease control) fish imports were to be officially banned 'no real hardship to the hobbyists' would be caused because of the availability of home-bred stock. This caused one U.K. importer to 'lose his cool', and he phoned us to insist that less than 1% of present imported numbers could be met from the tanks and ponds of home breeders. This is unfortunately probably true at the present time. Although not actively seeking limitations on imports (other than of any endangered species), this magazine has a policy of encouraging breeders to produce fishes for the retail trade (not for amateurs themselves to be general retailers, however), for reasons we have given in some detail in past Comments and Quotes. There is an unacceptably high proportion of imported stocks that dies soon after arrival or after acquisition by customers and it would certainly be no hardship for the hobbyist to be rid of this situation, since it is one that costs him money.

Tetra Jubilee

THIS year sees the twenty-fifth anniversary of one of the hobby's best-known international 'brand names' – 'Tetra'. The life of this German company has thus encompassed the period in which the most rapid expansion of our hobby has taken place. Congratulations are due to Dr Ulrich Baensch, founder of the Tetra organisation. To mark Tetra's Jubilee a special competition has been arranged by the company (readers received an entry form in last month's PFM, and dealers also have forms).

LETTERS

Your comments and views on all topics of interest to aquarists are welcomed. Address letters to PFM Letters, 554 Garratt Lane, London SW17 0NY

Cichlid Identity

MR S. Wolstenholme's erudite letter (PFM, November 1975) details admirably the confusion over the classification of the African cichlids. As an amateur aquarist where does one turn for positive identification? Writing articles in this magazine may be the answer. From the extraordinary collection of names under which this particular species is known, as listed by Mr Wolstenholme, which should one select?

With Dr Herbert R. Axelrod's gracious permission to use his plates, aware that my description was not wholly adequate for identification, I had hoped for just such a response as Mr Wolstenholme's in my effort to rescue this beautiful fish from the taxonomical swamp.

Opaline was used only in the descriptive sense — a pin fire opal of Australia — to denote the opalescent beauty of our 'living gems'. Surely an improvement on *L. joanjohnsonae*!

I am most fortunate to share a collection of African cichlids with Mr T. J. Horeman and feel that only by writing about our fish can I elicit help in identifying them. We have another beauty which has spawned twice and have yet to identify — for all the world it glows like amber/topaz . . . . .

(MRS) BARBARA P. MAYERS

Wadhurst, Sussex

Under-tank Heating

ENCOURAGED by an article in PFM (September, 1974) on heaters that could be made for use beneath tanks, I have been looking at this method as a possibility for tanks in my new fish room. I was therefore rather surprised to read the recent remarks on this subject in 'Personal Comment' (November, 1975) that tended to dismiss the method for what I think are spurious technical reasons. With a power cut the rate of fall of water temperature can be no greater with the under-tank heating than with in-tank heaters, and in fact could be less since the base equipment will pass on heat for a time after the electricity goes off. There is a lag in developing heat when current is switched on but the heat is evenly applied all over the base and the ensuing gentle increase is hardly a "real shortcoming". Heat is used no less efficiently from under-tank heaters than from in-tank heaters that I can see — without water agitation of some kind the latter do make heat pockets and promote the hot top-layer condition. I also think that anything to get electric wires and equipment out of our tanks should be desirable from the appearance point of view apart from safety aspects.

S. PHIPPS

Streatham, London, SW16

Fish Importations

IN Coldwater Scene (PFM, November, 1975) Mr Frank Orme states that a ban on the importation of foreign fish would be beneficial and that "Aquarists would not be deprived for there are enough people breeding . . . . . to ensure that stock would be available." Unfortunately, this statement is not accurate in respect of koi.

According to the Japanese, koi cannot be line-bred, consequently non-related high quality fish are used for breeding stock. High quality in this context means fish of about 18 inches in length costing several thousand pounds each. Very few fish of this calibre exist in this country at the moment. Indeed, the number of people in this country who have deliberately bred a specific variety of koi could be numbered on one hand. With this in mind, koi enthusiasts would obviously protest against any importation ban as it would deny them the source of their hobby.

However, all responsible fish keepers must be alert to the problem of imported

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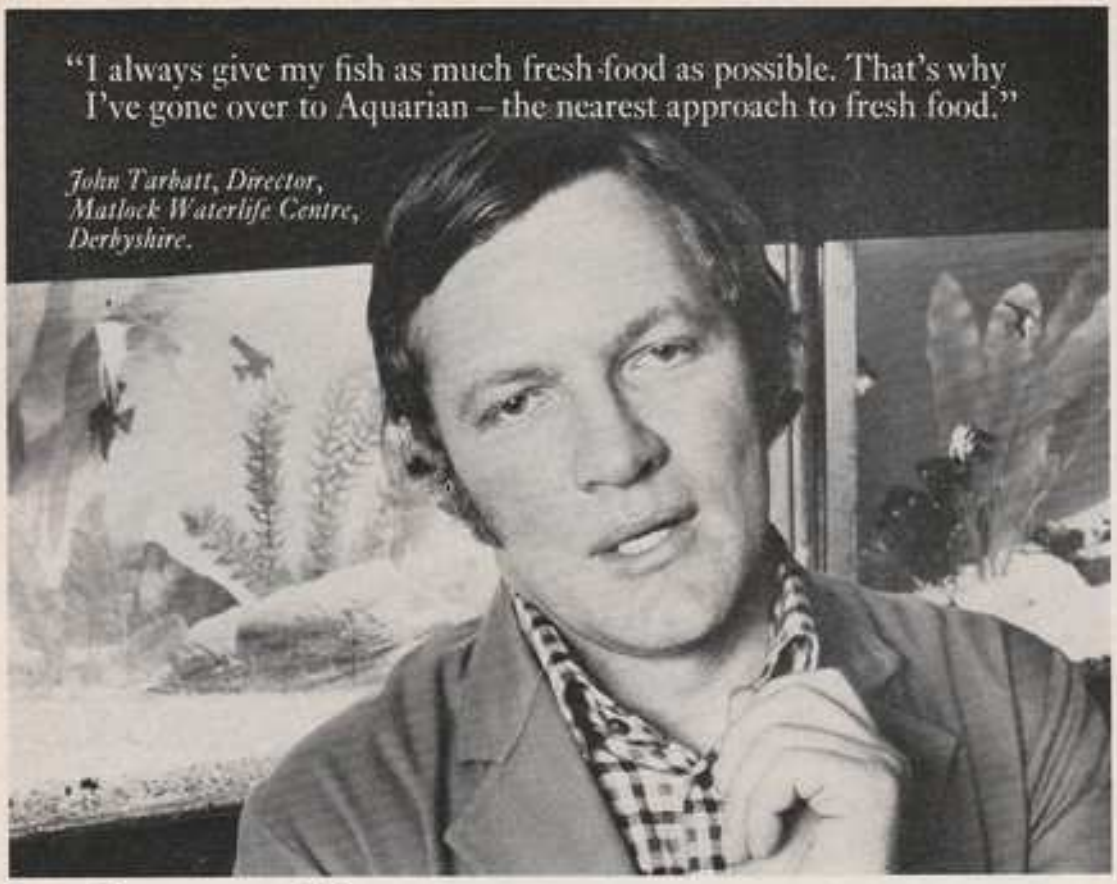

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LETTERS

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diseases. Newly imported fish should never be released into natural waters and those that die should be burnt. The symptoms referred to by Mr Orme, and called 'hole in the body' by koi enthusiasts, can be cured in koi and probably goldfish, by a variety of cures. The problem usually lies in identifying which type of 'hole' the fish has — at least four are now known — but cures are usually successful.

So until a ban on imports would not produce hardships, koi-keepers must support responsible importations rather than bans.

F. J. AYRES
Chairman, Yorkshire Koi Society

Reply to a Suggestion

IN the November issue of your magazine you published a letter from the secretary of the Lincoln & DAS suggesting that the Federation should supply manufacturing and distributing companies with lists of names and addresses of society secretaries and "keep the companies supplied with an up-to-date list".

What Mrs Woodliffe may not realise is that once such lists were generally issued, secretaries could be inundated with all types of advertising literature; and it is outside the province of the Federation to act as advertising agents. Also she may not appreciate the amount of work involved in circulating lists of nearly 200 affiliated societies, to say nothing of the postage costs. Scarcely a day passes without my receiving notification of changes of secretaries of societies.

Under certain conditions we do send out leaflets and samples to societies, but certainly not as a regular practice.

HUGH PARRISH
General Secretary,
Federation of British Aquatic Societies

Meetings and Changes of Officers

CATFISH ASSOCIATION GREAT BRITAIN. Chairman, Mr R. Goodson; treasurer, Mrs P. Lambourne; show secretary, Mr D. Lambourne (7 Wheeler Court, Plough Road, London, SW11 2AX; 01-223 2630); P.R.O., Miss F. Rogers (255 Lewisham Way, London, SE4). Meetings: every 2 months, second Monday, 8-10.30 p.m., St Saviours Church Hall, Cobbold Road, London, W.12. Next meeting, 12th January.

HEMEL HEMPSTEAD AS. Chairman, Mr S. Collins; vice-chairman, Mr R. Furnaux; secretary, Mr A. Bloice (28 Barleycroft, Hemel Hempstead, Herts.); assistant, Mrs S. Moore; treasurer, Miss K. Yeasdon; show secretary, Mrs J. Collins; assistant, Mr D. Thomas; stock controller, Mr A. Flowers; P.R.O., Mrs C. Thomas (3 East Drive, Oaklands College, St Albans, Herts.); social secretary, Mrs B. Church; catering officer, Mr D. Church; junior rep.; Miss H. Church. Meetings: every other Thursday, 7.45 p.m., Friends Meeting House, Hemel Hempstead.

LINCOLN & DAS. Madame president, Mrs B. Sellars; chairman, Mr J. Woodliffe; treasurer, Mr H. Stanham; secretary, Mrs S. Woodliffe (36 Richmond Road, Lincoln, LN1 1LG; phone 32790); news editor, Mr R. Towse; P.R.O., Mr D. Stainer.

READING & DAS. Chairman (re-elected), Mr A. Gibson (27 Holydale Close, Reading; phone 85502); secretary, Mr G. G. Vockins (10 Pembroke Place, Caversham, Reading, RG4 0MU).

SOUTH LONDON AS. Chairman, Mr E. Stainer; secretary, Mr P. Elson (66 Harold Estate, Pages Walk, London, SE1; 01-231 0049); show secretary, Mr T. Jones (246 Woodbine Est., Queens Road, Peckham, London, SE15); treasurer, Mrs E. Elson; FBAS delegate, Mr R. Narbrough. **New venue:** Marlborough Grove School, Marlborough Grove, London, SE1. Meetings: Every Thursday, 8.10 p.m. New members welcome.

SOUTH SHIELDS AS. Chairman, Mr W. Scott; vice-chairman, Mr L. Ruffell; secretary, Mrs J. Laydon (10 Morpeth Drive, Moorside, Sunderland, Co. Durham); assistant, Mr S. Sanderson; treasurer, Mr R. Scott; assistant, Mrs E. Ruffel; show secretary, Mr B. Risbridger; assistants, Mr R. Laydon & Mr G. Wright; librarian, Mr C. Minchell; social secretary, Mrs L. Scott; assistant Mrs A. Turnbull; editor, Mrs M. Scott; FBAS delegate, Mr P. Wright.

YATE & DAS. Chairman, Mr R. Hyett; vice-chairman, Mr D. Noble; secretary Mr & Mrs D. Read; treasurer, Mr R. Poots; editor, Mr A. Snell; P.R.O., Mr R. A. Bennett (22 Kents Green, Kingswood, Bristol, BS15 1XU); Jar show, Mr D. Walsh; assistant, Mr M. Williams, Mr M. Woods; Breeders Award managers, Mr M. Williams Mr Woods; librarian, Mr Farraday; Open Show results, Mr R. A. Bennett.

YEOVIL & DAS. Secretary, **new** address: Mr P. C. New (43 Lyde Road, Yeovil, Somerset; phone Yeovil 24225). **New venue:** St. John's Ambulance Brigade Hall, Yeovil. Meetings: First Wednesday of month, 7.30 p.m.

YORKSHIRE KOI SOCIETY. New Society. Chairman, Mr F. J. Ayres; secretary, Mr J. W. Mawson (78 Gledhow Wood Avenue, Roundhay, Leeds 8, Yorks; phone 0532 661108); treasurer, Mr D. M. J. Hollom. Meetings: Monthly at venues throughout Yorkshire and the North East. All welcome.

An Assessment of the Importance of Water Conditions in

Breeding the Emperor Tetra

By KEITH PURBRICK

(Hendon & District Aquatic Society)

Emperor Tetra

Nematobrycon palmeri (Carl H. Eigenman, 1911)

Classification

Family Characidae (Characins)

Genus *Nematobrycon*: *nemato*, from the Greek (genitive) word *nematos*, meaning thread. In this fish genus it refers to the extension of the caudal fin, where in the males the principal rays 2, 3, 9 and 10 of the upper lobe and 7 and 8 of the lower lobe are extended as filaments, giving the impression of a 'triple tail'; *brycon*, from the Greek (present participle) word *brykon*, meaning to gnaw, to eat with much noise, tear in pieces (also to roar or bellow).

Trivial name *palmeri*: This is a patronymic word, i.e. honouring or commemorating a person. Such specific names should always be in the genitive (Latin) and this is formed by adding, to the exact and complete name, an *i*, *ii* or *iana* if the person is a man, or an *ae* or *iae* if the person is a woman. Thus from *palmeri* we know that it is a 'Mister' Palmer.

History

Palmer is the man who first collected these fishes (in 1911) and Carl Eigenmann first described the collected fish.

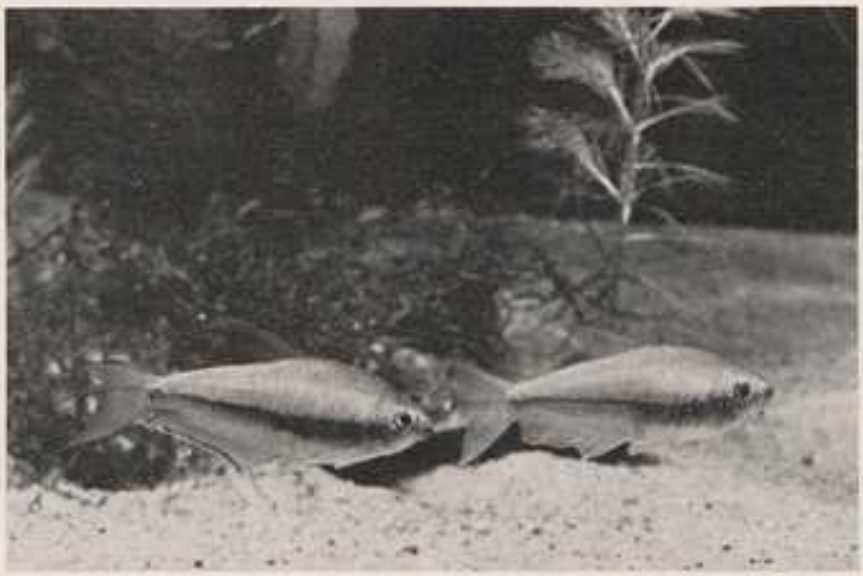
The fish comes from Colombia, South America, and is restricted to small weed-growing ponds and backwaters near the headwaters of the Rio San Juan, Rio Atrato and their affluents.

There are three named species of *Nematobrycon*: *amphiloxus*, *lacortei* and *palmeri*. It is suggested that *N. amphiloxus* is probably a sub-species of *N. palmeri*. Judgement on the systematic status of all forms of *Nematobrycon* must await collection of population samples from the headwaters of many uncollected tributaries of the Rio San Juan and Rio Atrato. It is said that *N. palmeri* and *N. amphiloxus* constitute one species whose colour pattern and body depth varies geographically. They were probably once isolated from each other but may have become mixed by a canal dug in Spanish colonial days between the headwaters of the Rio Atrato and Rio San Juan. It would seem likely that a fish such as this would more quickly occupy a sluggish man-made canal than open river fishes and that it is very likely that the two colour forms are now mixed to some degree in the headwaters of the Rio San Juan and Rio Atrato.

N. palmeri was first introduced to the aquarium hobby by William A. Kyburz in 1960. He was Swiss by birth but settled in Colombia in 1940, where his first interest was primarily the cultivation of strawberries and exotic flowering plants. In 1955 he reverted to the hobby of his youth and began to collect and export exotic fishes. Mr Kyburz's most famous introduction is undoubtedly *N. palmeri*. He followed this soon after with the introduction of *N. amphiloxus*, together with two annual killifishes, *Rachovia brevis* and *Austrofundulus myersi*. He also discovered two species of 'annual fishes' new to science.

IF I had one criticism of the reference books available to aquarists and fish-keepers, it would be the terseness, or lack of information, on ecology, environment and habitat on individual fish. Of course, one must accept that all-encompassing reference books must draw the line somewhere, otherwise the book itself runs into volumes and therefore runs beyond the financial means of those to whom it is pointed. Thus, for all intents and purposes, they must be expurgated.

The frustration still exists, however, and trying to live up to what I like to see, I have included, as frontal note, my scribblings on the background of this beautiful fish.



Breeding pair of emperor tetras (Photograph by R. Zukal)

In the narrative that follows, no attempt has been made to cite all the literature referring to species and forms of *Nematobrycon*. Particularly, no mention has been made of either morphometric or meristic data as I feel this may bore and confuse more people than it would interest. And then, one has to draw the finishing line somewhere, else too much trivia suffocates what is important to us.

My interest in *Nematobrycon palmeri* was rekindled a few years ago when I read at least one article stating that this fish could be easily bred in hard water. Being somewhat amazed at this claim I decided to look at this beautiful fish again, as we had always considered that soft water was the optimum condition for breeding.

Of course 'hard water' and 'soft water' are relative terms! What is hard and what is soft? It is not an easy question to answer, and one can by no means draw a definitive line and say either side of 'X' degrees is hard and soft. My own rule-of-thumb is that approximately 100 p.p.m. (about 6 degrees DH) and below is soft, and above that figure one is naturally approaching the hard water regime. Of course, many fishes only breed in certain degrees of softness so one must be careful when generalising. Most books and journals also state that the pH reading is important in the breeding of fishes — especially the majority of (smaller) characins. pH denotes the degree of acidity and alkalinity and is far easier to define (7.0 on the scale equates to neutral; below pH 7.0 is acid and above, alkaline). I will mention, as the story unfolds, what importance is put on pH and why perhaps the authors of the day recommend acidic readings, together with soft water, when breeding certain fishes.

The supply of fishes that are in demand is not always a ready one, as also with a fish that is seldom imported from the wild and is not a prolific breeder; *Nemato-*

brycon palmeri falls within this category. Until recently, most of the fish that were on the U.K. market were imported from German breeders. (Home breeders are now supplying a bigger percentage of those available.)

When my reinterest in this fish occurred I managed to obtain six specimens from a well-known London retailer. I was advised that the stock was of German origin. This fish is extremely easy to sex by a number of secondary sexual characteristics, but one predominates from a very early age — more of this later, however. I was therefore able to acquire three sexable pairs.

As with most of the smaller characins it is very important to bear in mind, when embarking on a breeding programme, that young fish should be used. The optimum age for breeding purposes is approximately 10 months. They will spawn much earlier but the size of the brood and the size of the resulting fish will be inhibited because one is breeding with smaller fish. At about 10 months the fish should be well grown and approaching something like two-thirds to three-quarters of adult size. If one leaves the fish beyond 10 months this is not too critical, but I would recommend to breed certainly before the fish is about 14 months old. Although the fish live for something like 3 to 5 years they become much harder to breed the older they become. They are in their prime at the age mentioned above (10-14 months) and they will spawn much more readily at this age, because the males are at optimum virility and the females at optimum fertility.

Most people's (fish) breeding arrangements are individualistic. Some like, for example, bare aquaria, artificial spawning media, small aquaria, removing eggs rather than parents, introducing the male parent first. Others prefer to do the opposite and many will have a compromise between the two. One's method is unimportant provided the result is the same, i.e. a successful brood of youngsters. However, for the sake of the story I will recount my own personal preference.

I use a 24in. by 15in. by 12in. aquarium — furnished, i.e. with a liberal quantity of established plants (mostly cryptocorynes and *Microsorum pteropterus* — Java fern). I also introduce a quantity of Java moss as an alternative spawning medium. The emperor tetra does not need such a provision (or nylon mops as an alternative) as they will spawn anywhere! I have personally seen them spawn on heater cables and in *Riccia*! The prime reason for using Java moss is as an 'egg-security medium'. The fish will naturally be tempted to eat eggs that are blatantly visible and therefore the value of the Java moss is that the eggs are hidden amongst its myriad of fine fronds. The temperature can be variable — anything from 75°F (24°C) upwards — but I prefer to regulate at 82°F (28°C) as the eggs and fry then mature to the free-swimming stage more rapidly.

I always (with all attempted breedings of any fishes) separate the sexes for 7-14 days before introducing them into the 'set-up' aquarium and I always introduce the female into the aquarium at least 24 hours before the male. I leave the tank, when both fish have been introduced, with no light. Some people advocate blacking the tank out, but my preference is just not to put the overhead light on. My personal preference is for a dark lime-free gravel and I use North Kent Blue Flint Grit of 5/64in.

When does one remove the parents? When do you know if they have spawned? Most literature tells you that you can always tell because the female will look (much) slimmer! I find this method (with characins) extremely unsatisfactory. Especially with *Nematobrycon palmeri*, as in this fish the females do not get overtly plump because they do not lay many eggs. The best advice is to watch your female carefully. Besides a colour change in the female after and during spawning (the lateral black line diminishes to a thin black streak) she will show the scars of an attentive male. If her finnage is split, torn or bitten you can normally be assured that spawning has taken place and the male is attempting to drive an unresponsive female who has laid all her eggs. Then is the time to remove the parents. The eggs are not small — approximately 1 mm. in diameter — and are a honey-brown in colour.

Now to the most important issue — water! I put pairs down to spawn in hard water to test the article I had read. The tap water in my area is quite hard, about 400 p.p.m. (22 degrees DH). Provided your fish are in good condition they

will spawn. However, the problem is hatching the eggs. On several occasions, at this hardness, the maximum hatch for spawning was four to eight fry. This I regard as a failure, but, I raised these small batches with the intention of spawning them, in case these fish, bred and raised in hard water, would be more successful when spawned in their turn. This experiment was also unsuccessful as again I was only rewarded with hatches of four.

Persevering, trying to find a way to successfully raise bigger quantities in hard water, I then treated this tap water with one of the proprietary brands of liquid peat extract. This had quite a significant effect! In such conditions I could obtain hatchings of approximately 30. This was much more successful than the unadulterated hard water. This acidic compound has, of course, little effect on the hardness of the water, but as is well known the acidification of water cuts down the bacteria content and therefore less eggs are attacked by such organisms.

However, I was again dissatisfied with the size of the hatchings and changed to the use of rain water in the aquarium. The water had a hardness of 108 p.p.m. (6 degrees DH) and a pH 7.4. With this method hatchings more than trebled — I was able to hatch and raise 105 fry — and I think that this is somewhere near the maximum for this fish where most literature quotes spawns being in the region of 50-80 eggs.

In my experience this fish cannot be successfully bred in quantity in hard water. I feel that if one is seriously interested in propagating this species then a little extra care and attention is required. If this is given, then, success should follow as a matter of form. Personally I feel that this is one of the most attractive fishes that one has the good fortune of seeing on the market in ever-increasing quantities. There is no better sight than an aquarium with a shoal of 70 plus emperor tetras. And, after obtaining one pair of these beautiful fish, there is absolutely no reason why everybody should not be able to acquire this quantity on one spawning.

Although this concludes the main reason why I wrote this article, it may be of interest to readers to know some of the ancillary points that arise when one breeds and keeps a species of fish for some few years.

Ancillary Observations

Sexing. I am annoyed when I read in some literature that characins are difficult to sex. This is an over-generalisation and is simply not true in many cases. Most (especially the smaller ones) have secondary sexual characteristics. For the emperor tetra there are several methods for sexing.

(1) The male has a 'blue eye' (i.e. blue iris of the eye) and the female has a 'green eye'. I have never seen an exception when dealing with *N. palmeri*. This is the easiest method of sexing and eye colour is discernible when the young are approximately 40 days old.

(2) The male has a longer dorsal than the female and, of course, only the male's caudal fin has the filaments. His anal fin is also pointed posteriorly and, in many characins, the male has longer pelvic fins that are also pointed. In the female they are shorter and rounded.

(3) Colour — the male's colour is far more intense than the female's. There is a higher intensity of yellow in both his single and paired fins; the female's tend to be almost colourless.

(4) The male grows larger than the female: males approx. 2in., females approx. 1¼in.

(5) During sexual sparring among males there is an unexpected suffusion of rose red throughout the body and fins. I found this quite surprising at first observation, as red is not a colour one normally sees in this fish.

Finnage and size. I found it quite surprising that with captive bred fishes the finnage (principally dorsal and caudal fins) was much more extended than in wild or original stock fishes. This was a common denominator of all male progeny and not just pertaining to one or two. This factor continued with second to fifth generations. As with over 'in-breeding' most fish, the strain weakens if 'new blood' is not introduced. With some experiments we undertook, it was obvious by the third generation that although one had acquired fish with much more beautiful finnage, one had lost on overall body size.

Colour variation. The most exciting

feature to have occurred in this pleasant programme was the observation of a colour variant in certain male siblings. As we know, the outstanding colour in the anal and pelvic fins of normal males is yellow. This yellow is quite brilliant, and therefore striking, and one of the features that makes this fish so attractive.

We have a few males, from different generations, in which the yellow has been replaced by bright orange. This eye-catching variant is intriguing to say the least and in the near future we hope to breed with these 'colour-change' males to see if (a) we can fix this colour or (b) it is an inconsistent mutant.

Acknowledgements

Literature consulted includes publications by S. H. Weitzman and W. L. Fink (Division of Fishes, Smithsonian Institution, Washington) in *Beaufortia* (series of publications by Institute of Taxonomic Zoology, University of Amsterdam). Hendon AS members Mr D. Allison, Mr B. J. Mould and Mr H. G. J. White have also contributed to the information presented.

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65 Years of Fish Production

The Kiev Fish Farm

By GEORGE MAMONOV
Kiev, USSR

THE famous Kiev Fish Farm is acknowledged to be the best in the USSR. The Farm was founded as a private fish house in the year 1910 by L. Sheljuzhko, an amateur aquarist and expert entomologist. The fish house was actually built by his father, A. Sheljuzhko, as a glasshouse, of very great size. It contained over 200 large 'basins', each a cubic metre in capacity, and about 56 large 110-gallon (500 litres) tanks. Both the water in the tanks and the air in the building was warmed by the circulation of warm water through a special piping system. The building was the best of its type in Europe — superior in size and quality to the best European farms and even to the famous Berlin Fish Farm run by Matte. But at that time, the glasshouse was being used to hold decorative collections of fishes and not for their mass breeding.

Some species of fishes did breed, of course, such as the livebearers — mollies, swordtails, guppys and other easy-to-breed species. One of the world's first spawnings of the livebearing *Belonesox belizanus* took place here, but perhaps the best-known 'first' was the successful propagation of the problem catfish *Callichthys callichthys*. A pair of these South American catfishes built a bubblenest in a 6 ft. by 3 ft. by 1 ft. tank and, in fact, built a second bubblenest there, too. The fish collection contained the puffers, *Tetraodon cutcutia*, *Pantodon bucholzi*, *Gasteropelecus stellatus*, panchax species available at that period (under the old name *Haplochilus*) and, of course, various barbs, *Brachydanio*, gouramies and other labyrinths, and cichlids. Many rare specimens were imported from Germany, and particularly from the well-known Berlin trader, Matte. Fish were also obtained on trips made by the Kiev staff to China, south Asia, Spain and Italy and indeed many of the strains of goldfish available at that time were shipped into Kiev from these Asian expeditions. But, on the other hand, many were the rare varieties of black telescopes and fancy fantails that were exported from Kiev into Germany.

The Kiev Farm was not only a fish farm but a plant house too, and there were over 100 specimens of plants available for sale to visitors, such as various native aquatic plants (*Sagittaria, Myriophyllum, Cabomba, Vallisneria*) etc. The greenhouse was famous for its large collection of contemporary tropical orchids, succulents, palms, agaves, ficus etc., and the orchid species were especially successful. As well as the fishes, there were also housed in the glasshouse various tropical turtles and lizards, tree frogs (*Hyla arborea*) and salamanders.

one big boa and two alligators over 2 metres in length, together with various exotic parakeets. This tropical house was free to visitors, amateur naturalists, schoolchildren etc. and there they could buy the fishes, plants and animals at various prices. Orders were accepted from other towns and the fishes were transported in special tanks in the care of an attendant.

After 1920 the Kiev Tropical House became a laboratory of the Academy of Science. The fishes, reptiles and some mammals (monkeys, lemurs) were housed in the glasshouse too, but special emphasis was now given to the keeping of native common frogs, forest birds, fishes and snakes including central Asian species (*Elape, Coluber, Vipera lebentina* etc.). During this period also the staff of the Kiev Farm were collecting butterflies from central Asia; the collection also included many tropical specimens and, after the British Museum collection and that in the Rothschild private collection, was the best in the world. Now part of this collection is kept in the Zoological Museum of Kiev University.

1943-1947 were years of reconstruction and after this the Farm began to specialise in the mass breeding of fishes. The first species kept for breeding were swordtails, mollies, guppys, gouramies, *Macropodus, Brachydanio rerio, Brachydanio albolineatus*. Then new specimens were introduced: *Hyphessobrycon flammeus, Hemigrammus caudovittatus, Gymnocorymbus ternetzi, Tanichthys albonubes*, pearl gourami, *Colisa lalia* and various species of *Puntius*, including *P. pentazona, P. conchonius* etc.

During this period only three people were specialising in breeding — three young women who began to work on the Farm after teaching fishkeeping in technical school and doing practical teaching work in the Moscow Zoo Aquarium under the famous fish breeder Molchanov. This first generation of fish breeders worked at the Farm for about 25 years. Each worker raised annually some 10 thousand fishes at first; this grew to 25 thousand, and after some years' production reached about 75 thousand fry, then 100 thousand and even 120 thousand young fishes. Each specialist breeder also cultivated plants and about 10 thousand of some 10-13 species of plants were grown each year. Apart from the tropical department, the coldwater department were producing many goldfish and golden orfe for the wholesale trade in various districts, and for aquariums and zoos etc. It was probably the best goldfish department in the USSR. The coldwater department also used outdoor ponds, functioning in the warm season only, from the beginning of spring to the middle of autumn. The outdoor department began to breed American catfishes and perch as the goldfish declined in popularity, particularly in the aquatic retail trade.

Today, after 65 years of successful functioning, there is a new, young generation of master fish-breeders in the Kiev Fish Farm. Many new specimens of tetras, cichlids, rasboras, catfish, killies (*Aphyosemion*) and glass fish (*Chanda*) are being bred and the breeding of imported problem cichlids (including the African species) and tetras etc. is being solved.

What methods are used at the Fish Farm? Each master-breeder has an individual section of tanks for working on, plans his own breeding programme and specialises in certain species, for example, in barbs, or livebearers, or *Brachydanio* etc. The adult fishes being used for breeding live in large containers, the sexes being segregated into individual tanks. The best male and female is selected and put into the spawning tank. Each master-breeder personally knows his best producers by sight and selects them especially for breeding, and it is this careful selection that gives the best results as regards quantity and quality of eggs and fry.

Adult tropicals are fed on tubifex, obtained by a collector from natural ponds. Whiteworm is one type of livefood cultivated on the Farm, as well as Infusoria for the young fish, and microworm. In the early days, daphnia was bred in one basin but this culture is not maintained now as the Fish Farm staff believe that it is cheaper to collect the water fleas from natural ponds. Artificial food is also used sometimes and this is used mixed with invertebrates and plankton from natural ponds for the goldfish. Infusoria is bred for the fry from hay extract and the fry are also fed on plankton collected from ponds. For glass fish (*Chanda*), for example, water green with *Euglena* from ponds is used. Of course, plankton, Infusoria and *Euglena* are also bred in tanks.

The modern Kiev Fish Farm contains rows of big basins and tanks in the tropical glasshouse. The system of warm water pipes regulates the temperature. There is an aeration system for each tank and fluorescent illumination to stimulate plant growth. The chemical characteristics of the water (pH, DH etc.) are carefully studied in the laboratory. Today, infectious diseases are seldom found in the Farm. In earlier days diseases were often caused by disturbance to the normal temperature during the cold season and the parasite *Ichthyophthirius* ('white spot disease') was a particular headache. Fishes are treated with salt, sea salt or a solution of potassium permanganate. For the quick disinfection of equipment and tanks a solution of sodium hydroxide (caustic soda) is used. Years of observation on the Farm have proved that a treatment period of 6-7 days is effective for many adult fishes. Only 1-2 days are necessary to obtain good results in young fish. Some species, such as swordtails, guppys, *Brachydanio rerio, Brachydanio albolineatus,* are not very sensitive to *Ichthyophthirius* and these species recover from the disease very quckly without a lot of treatment. Some species of barbs and goldfish are tolerant to concentrations of salt in the aquarium water. During the Farm's early days the usual percentage of fishes dying during growth was about 5-10%. However, such a high percentage was not good for the Farm's finances and now the percentage has dropped to less than 5%. Figures such as these have contributed to the success of the Kiev Fish Farm as a supplier of thousands of fishes to over 300 shops in many areas, and contact with the trader and aquarist societies has helped the Farm to develop new business.

The methods of construction used in the Kiev Farm make it a splendid model for the middle European area with its cold winter season, and modern farms that have grown up in other towns of the USSR have used the Kiev Fish Farm as their model. Its long history and the experience gained by the workers there makes it certain that the next 65 years of the Kiev Fish Farm's life will be as active and interesting as the 65 years that have gone.

MARINIST'S NOTEBOOK

Marine Fishes — to Order

By ROY PINKS

TROPICAL marines à la carte seems to be a growing tendency in the trade, and it is worth considering some of the practical aspects as well as the implications. At one time it was "take it or leave it", and if you didn't care for what you saw in a dealer's tank, you went along to the next shop, and if you asked for a certain species, you always got the answer that it was coming in shortly (though in practice it never actually put in an appearance). There were usually dozens of the commoner species of clowns and damsels, and there were long intervals between the availability of the novelties. No-one ever actually ordered anything, and there would have been curious glances at anyone — on either side of the counter — who suggested that such a speculative activity could be countenanced. During my meanderings whilst on holiday recently I noted several firms whose practice was to stock a fairly wide range of single specimen fish, and to solicit orders for any which did not appear in their tanks. One establishment went to the extreme of displaying only a range of fish which they could order — none on view were for sale.

Before discussing the pros and cons of all this, I would make the observation that I have never before seen such a wide variety of species on sale, nor has the overall quality seemed so high; there were hardly any tanks full of a single species, the individual specimens looked to be in good health, and there were few signs of physical damage like torn fins and missing tails. Another encouraging feature was the fact that prices were fully comparable with those I was paying 3 and 4 years ago, which is quite remarkable when one considers inflation together with the gloomy

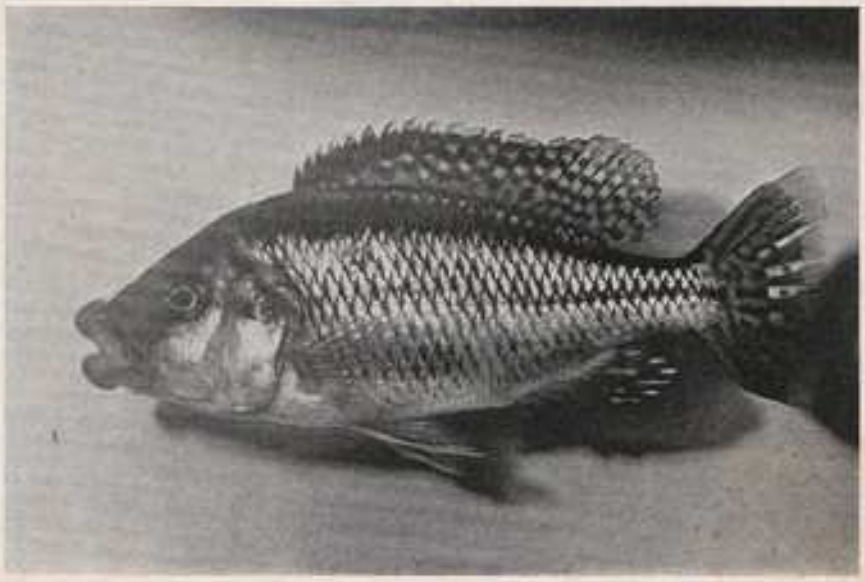
forecasts of not so long ago that curtailment of imports would bring about a serious climb in costs. At all events the overall tropical marine scene was as healthy and encouraging as I have ever seen it. The only fly in the ointment was nil evidence that there is any appreciable advance in techniques enabling us to lengthen the life span in captivity of the specimens which were available.

If some rationalisation in collection and marketing has resulted in this apparent improvement, how are we to regard the new facility of being able to order what we want? I think I should make it clear that the potential buyer is given a really wide choice of species, and although supply is always subject to availability, the system really does seem to give access to many specimens for which one would have had to wait ages under conditions prevailing a year or so ago. The establishments which do not offer fish for sale direct from their tanks are appealing to the serious student or collector, and not the impulse buyer, and this must be seen as a significant improvement in times when there is so much ignorant money changing hands. The planning of a small collection of fish now becomes something of a reality, and the collector with defined aims may, if his orders are realised, gather together a compatible community without falling foul of the disastrous distractions which so often accompany normal impulse buying.

Of course, the usual conditions of buying and selling apply to the ordering and selling of marine fish. If the prospective purchaser is dissatisfied with the specimen procured he should refuse to accept it. The retailer will usually not worry unduly if this is a ready selling species, but relations will certainly become strained if the subject happened to be unusually large, expensive, or in some way difficult. If this form of marketing is to be a success, there must obviously be some give and take between buyer and seller. If the buyer feels that a specimen is below par, he should ask for a substitute, but if the seller thinks the buyer is being quite unreasonable he should, perhaps, offer to keep the specimen in his own tanks for a period in order to demonstrate its soundness.

Close understanding and confidence is clearly essential on both sides if we are to get the best out of all this. The buyer may wish to take his fish direct from the carrier's box, without trans-shipment through the retailer's water, and this undesirable and avoidable water change may often be prevented by means of close liaison with the supplier. You may have to pay for a telephone call, however, but even at prevailing Post Office rates, this is still worthwhile. In future articles I will enlarge somewhat on this theme, as I intend to obtain some specimens to order. I wonder whether I shall finish up simply impulse buying or not?

Is it New to You?



This fleshy-lipped Lake Malawi cichlid (*Haplochromis euchilus*) is one of a pair that won the Marsh trophy for Mr T. Butler at The Aquarium Show '75. Photograph by Cliff Harrison.

A Visit to a

Fish Breeder Extraordinary

By FRED CAMPBELL

DELIGHTFULLY domiciled in the picturesque village of Holcombe Brook, which nestles in a fold of the foothills on the Lancashire side of the Pennines, is Harold Cooper. A prominent figure in northern aquatic circles, he is a FNAS official, a judge and lecturer, and tropical fish breeder extraordinary. When I visited him last summer, I was immediately aware of the beauty of the surrounding country, the blaze of colour his garden presented and the fine crops of tomatoes, cucumbers and melons in his greenhouse—but I saw no sign of a fish house. Eventually, however, he led me through his garage and there it was, a partitioned off 9ft. by 6ft. compartment at the rear, modest in comparison with his achievements.

I was glad I had taken his advice and left my jacket in the house, for the air temperature was around 80°F, maintained by two thermostatically controlled tubular heaters installed beneath the two banks of tanks. There are 22 aquaria of various sizes from 18in. to 3ft. 6in., but it was the quantity and variety of the contents which filled me with amazement. Angel fish were there galore, ranging from babies to adults, the product of a line spreading over four generations. There were over 400 specimens on view plus a batch of eggs almost ready for hatching.

I was then shown broods of pencil fish, cherry barbs, White Cloud mountain minnows, yellow wags, zebra danios, black widows, glowlights, agassizi, lemon tetras, American flags and congo tetras. In addition to the foregoing, in the last 12 months Harold has bred and disposed of red wags, dwarf gouramies, leopard danios, Australian rainbows, *Girardinus metallicus* and orange chromides. A total of 18 different species of home-bred fishes, twelve of which were being grown on in his fish house. In fact, of the 700 fishes I saw on view only 24 were not home-bred.

I asked Harold to what he attributed his remarkable success, venturing to suggest that it appeared he needed only to put a male and female together to get results. He agreed that, to some extent, this was the case but emphasised that his fish are kept in breeding condition by an ample and varied diet of live food and only in cases of emergency are dried foods resorted to. I was shown a bath full of daphnia and cultures of whiteworm, micro worm and Grindal worm. He does not, however, culture Infusoria for his newly hatched fry; he relies on the proprietary liquid suspensions and finds them satisfactory.

With congo tetras, however, he did expect some opposition and consequently made special preparations. He obtained two pairs and separated them for 2 weeks, feeding them well. Both pairs were then placed into a 2ft. by 15in. by 12in. tank, with a water depth of 6in. at a temperature of 80—83°F and bare except for a bunch of peat fibre. Blackwater Tonic was added to produce dark acid water and the final readings were pH 5.5 with 3.5 degrees German hardness. The light was excluded and in 2 days large clear eggs were seen in the fibre. They were not scattered but placed in two distinct groups as though in a nest, probably separate spawnings from each pair. Hatching took place in 8 days and the parents were then removed. They immediately spawned again!

Although Harold has been breeding fish for many years his efforts have concentrated mainly on cichlids, photographing the mating and spawning procedure and

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COLDWATER SCENE

By FRANK W. ORME

• New Association to look after coldwater interests

• Observations from round and about in 1975

TO commence this, the first 'Coldwater Scene' of the New Year, I go back to an event of last November. That month a meeting took place, at Foleshill, Coventry, of the major goldfish groups. The delegates representing these groups reads like a page out of 'Who's Who of the Goldfish Keepers'. Bristol AS were represented by Mr H. G. B. Thomas, Mr W. G. Ham and Mr S. Lloyd, the Goldfish Society of Great Britain by Mr R. A. Dodkins, Mr N. G. Berger, Mr W. Leach and Mr A. C. Law, the Midland Aquarium and Pool Society delegates were Mr F. R. Close, Mr T. L. Dodge and Mr A. E. Roberts and the Northern Goldfish and Pondkeepers by Mr W. H. Ramsden and Mr B. M. Rothwell. My own group, the Association of Midland Goldfishkeepers were represented by Mr R. Giles, Mr D. J. Hancox and myself.

The delegates, by general consent, elected Mr 'Tony' Roberts temporary chairman — a wise choice as he very ably guided the delegates through the various matters that had to be discussed. The whole purpose of this gathering was to form an 'umbrella' organisation for goldfish-keeping bodies—something long overdue!

From the outset it was very obvious that all delegates had come with the intention of 'seeing the other fellow's point of view'. The mood of the meeting was extremely friendly and not once did Mr Roberts have to call order to the floor. The various points were discussed with unbiased, well-reasoned argument for and against each proposal. This sensible 'give and take', compromise and amendment, allowed each decision taken to receive the full support of all delegates—and so, from 11.00 a.m. until 3.00 p.m. on that Sunday, the formula of the new body was constructed and given the title of Associated Goldfish Societies.

This must be one of the most democratically constituted bodies and in order to illustrate this—and, perhaps, set an example, I give the outcome of the various proposals that were discussed and which were agreed as the 'guide-lines' of the newly formed AGS.

1. To promote good fellowship and understanding by furthering the well-being of the fancy goldfish hobby in all aspects and matters. No decisions shall deprive any group of its individuality or freedom to manage its own affairs.
2. Membership shall be open to any Association, Society, Body or Group, but must be approved by the member groups.
3. Delegates must be bona fide goldfish keepers.
4. The chairman shall be elected in rotation, by the delegates, for each meeting. The secretary and P.R.O. shall not be eligible to act as Chairman during their term of office.
5. Each member group shall contribute an equal annual affiliation fee. The sum shall be revisable and must be approved by the member groups.
6. All decisions must be approved by all delegates. Important matters must be put before the membership of member groups who will instruct their delegates how to vote.
7. The minutes of each meeting shall be made available to the member groups by their delegate.
8. In the event of the 'voting delegate' being absent from a meeting another may be nominated in his stead, each group sending up to four delegates to a meeting of which only one shall be entitled to vote.

Goldfish keepers now have a body, founded upon mutual respect, to look after their interests and further the goldfish hobby. Any group of enthusiasts, anywhere

in the U.K., who would like to form their own specialist society are now able to obtain advice on how to go about the venture and can apply for membership of the AGS. Obviously the more goldfish keepers who form themselves into societies (no matter how small), and become members of the Associated Goldfish Societies, the stronger will our hobby become. Readers who would like further information should write to the secretary: Mr F. R. Close, 154 South Road, Handsworth, Birmingham.

★ ★ ★

The British Koi-Keepers Society bulletin is becoming quite professional — the 14 pages containing some very interesting and most informative articles. Eleven titles are listed in the index, ranging from 'Things Japanese' (a descriptive tour of last year's visit to Japan), to 'Water and Water Conditioning Systems', together with intriguing titles such as 'Odd Elephants' and 'Queer Fish'. On a personal basis I noted with pleasure, and gratitude, that the editor had drawn his member's attention to the 'Breeders' Directory', which I suggested in these columns and which our Editor supported with his offer to insert details in PFM free of charge. Can we look forward to seeing breeders of British-bred koi in the Directory? I hope so, for this will no doubt draw many more people into the hobby. Acclimatised young koi will give the purchaser a greater chance of success—a successful fishkeeper usually becomes an enthusiast. Imported stock must have disillusioned many would-be fishkeepers!

The 'PFM Directory' is of course, open to all amateur fish breeders, whether tropical or coldwater, and, with the 'no charge' offer, is worthy of support by all. Where can the novice, or for that matter the experienced aquarist, find information that will enable a particular species or variety of fish to be located? Surely the obvious place to seek such information is in a magazine devoted to the hobby. Therefore, if you breed stock and have not yet sent details to the Editor may I suggest you do so now—while it is in your mind. There is much to gain, and nothing to lose, by supporting the scheme.

★ ★ ★

Unfortunately, because of a 'flu bug', I was denied my visit to The Aquarium Show '75 in London. It was with regret that I missed this event—especially as it prevented me meeting many of my fishkeeping friends. This, in itself, is always something to look forward to.

I have already reported both the Midland Aquarist Festival and the Bristol AS Coldwater Show. The other major coldwater show was the one staged by the Goldfish Society of Great Britain. A total of 28 classes attracted 232 entries to the adult and Breeders classes. A feature of the GSGB show is the Auction Sale where quality fish are sold to the highest bidder. This show, like Bristol, is one of the few, quite possibly the only, purely coldwater open shows. I wonder whether the day will come when a National Coldwater Show will be held, and recognised as such?

★ ★ ★

Last year had its ups and downs, and I have both 'caned' and praised when I felt either was warranted. This New Year offers opportunities for all coldwater enthusiasts to improve their hobby. Let us all hope that sufficient goodwill and enthusiasm exists to bring about a closer liaison and understanding of all sections of the coldwater hobby—the first steps have been taken. Goldfish enthusiasts have swallowed what few differences they had and banded together. The BKKS have held two very successful koi shows. The specialist coldwater shows have improved and found greater support. These are all welcome signs of the efforts that are being made. Long may the trend continue!

Fish Breeder Extraordinary

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producing coloured slides for his lectures. He has been induced to widen his scope by a policy adopted by the Bury and District AS, of which he is a member. A breeder's award scheme has been introduced whereby members can attain a Master Breeders Certificate by breeding five different species of fish in each of three sections based on difficulty of breeding. Harold is the first, and if other members follow him there will be no shortage of fish in that Society.

by ARPEE

Personal COMMENT

FROM all sides we are enjoined to be methodical and scientific, and to reject the rules of thumb and the approximations on which we were weaned. It appears that one of the principal present-day sins is the habit of continuing to refer to fish by their popular names, in preference to approved scientific terminology. At any rate, there are those who would cast us all into a common mould, of which accuracy would be a prime characteristic, but character, as such, would not. I have no wish to start a war on the subject, but I think we may take it as read that the vast majority of aquarists will have nothing of this silliness. When it suits us we will use the old and well-regarded common names which have in many cases reached us through the centuries; and when it suits us we will use the scientific name. It will all depend on the circumstances.

I feel rather strongly about the matter just now because I have seen an example of how both Nature and man can unwittingly join forces to mete out sad justice to a creature so blameless that many of us don't even know it exists. If I referred to the *Prionobrama filigera*, some might guess that it was a form of pondweed, and others that it was a distant relation to the piranhas. I wonder how many readers managed to get it in one go?

This fish is commonly known as the glass bloodfin—at least that is what the book says. But 'common' in relation to this species is a totally inapt word, because there's almost everything that is unusual about it. It looks like a bloodfin (*Aphyocharax rubropinnis*), but it has an ethereal air about it—it is far less tangible—and it has a more positive motion through the water, seeming to slot itself into position after position, often at lightning speed, which is quite dissimilar to the more insinuating progression of its relative. In quantity this species could constitute a Grey Eminence not to be scoffed at, as the beautifully sculptured and white tipped finnage, notably in the males, adds a degree of dimension to the body itself which is really impressive when viewed in subdued light.

I quizzed several dealers about these fish. They were unanimous in writing it off as a bad seller, rather like *Rasbora pauciperforata*, because in shop tank conditions it does not rise to the heights it can achieve when it is given a suitable home. Thus, this species does not push itself, it is equipped with a horrible tag, and the trade has no time for aesthetics. Little wonder that it has hardly ever been heard of, and unless you know its scientific name, you have less than a fair chance of locating it in the available bibliography.

Several came my way recently and I wish I could get hold of some more at the price I then paid for them. During quarantine they were decimated more by the cure than the outbreak of white spot which unfortunately came their way, and I now have only a single specimen. This, however, is such an attractive little creature (2½ in. is about their limit) that it gets its full share of attention. It is unafraid of fish greatly senior to it (including a large red-tailed black shark), and joins in at feeding time with all the rest. It tends to occupy the rear water of the tank, and this could prove to be a great asset, if only I can procure a few more specimens, as a sort of moving backdrop. I would classify it as a completely peaceable species, with very strong potential as a first-class foil fish.

If you have any doubts as to the long-term appeal of fish like these, just watch visitors to zoos. They take a quick look at the elephant, which they can see, and give it a bun. They then pass on to the Owl Pen and spend half an hour trying to locate a single bird. The obvious, therefore, is not always what counts, and aquarists would be well advised to consider the Cinderellas, in the full knowledge that the big sisters are well able to take care of themselves.

Frank Orme's 'Coldwater Scene' recently contained an observation which will be questioned by many. He quoted a statement by Mr L. F. Clements that if water can be maintained in a healthy condition for an indefinite time in marine tanks, then the same principles can be applied with equal success in the coldwater set-up. The argument ran on the lines that the use of biological filters and bactericidal measures like ultraviolet radiation should make it unnecessary to change the tank water etc. The notion will come as a distinct shock to many marinists who have for some years past been grappling with the problem of how to keep their fish alive for more than a few months on end, and I am sure that most of them would be absolutely delighted if water management in the marine tank were only twice as difficult as in a coldwater one! In actual truth, the real factor of difficulty is very much higher than this.

There are many authenticated examples of successes in marine fishkeeping, which appear to have arisen because of the application of sophisticated techniques like ultraviolet treatment, but I have yet to find evidence that such measures, standing alone, have really contributed much at all. What tends to happen in any hobby is that enthusiasts well aware of the basic difficulties carry out experiments and pronounce on their success on a short-term basis. As a consequence, many panaceas always seem to be around, but when it comes to trying them out we tend to find that there comes a time when things don't seem to be going so well, and we come to the conclusion that the enthusiasts were less communicative about their failures than their triumphs. It does not need a scientist to make the point that knowledge of defeat is perhaps even more vital than an advance.

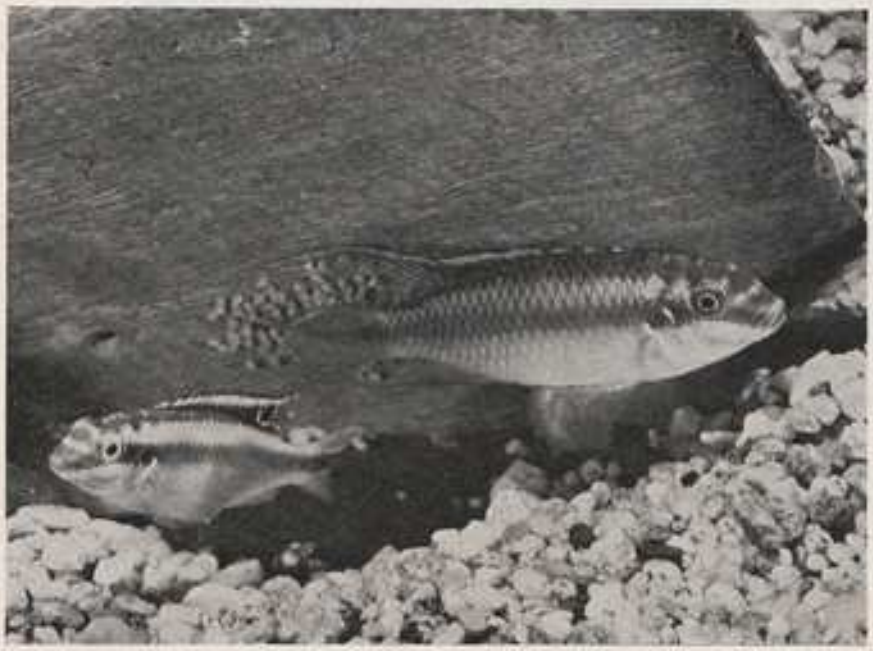
What has happened in the marine scene is that there is growing understanding of the relative value of a number of factors in water management. The great work performed in the U.S. by such as the late John M. King and by Stephen Spotte has emphasised to the average aquarist that he should first read up his aquarium chemistry and then proceed to keep his marines in as simple a manner as possible, but subject always to some quite rigid disciplines.

Although the validity of each factor must vary according to the environment and the nature of the creatures being kept, the very big thing which comes out is that water changing is a must, and the more frequently it is carried out, the better. So if coldwater enthusiasts think they are going to have an easy time by emulating the marinists, they should think again. I have no doubt that it would be difficult to criticise Mr Clements as harshly as I have done if I had had access to his entire argument, but on the matter of water changing I think he must be very wide of the mark. The techniques which may be brought into play to condition water in such a way that it need only, in theory, be changed at rare intervals are probably quite good-looking as pure scientific statements. In other words, it could be said that they are compatible with goldfish breeding.

I suggest that for the breeding of goldfish (which is quite another thing) the rather rule of thumb techniques traditionally used by the small breeder are those which should be encouraged, mainly because they result in better fish. Mr Orme makes the very point himself in describing the fish which defied their owner's attempts to make them spawn, but which ultimately did so in a tank of aged water, into which they had been consigned, in disgrace.

So far as goldfish are concerned I think it would be to the advantage of all if fewer but fitter fish could be produced in this country. Large-scale breeding of commercial rubbish (to say nothing of equally rubbishy imports) has brought the goldfish almost into the category of a hothouse species. Breeders should therefore get down to the job and roll their sleeves up. Those who can't bother to change the tank water should turn their attention to pursuits where the pace is less challenging, as on fundamentals like this there can be no real compromise.

The Dwarf Cichlid 'Kribensis'



Pelvicachromis pulcher

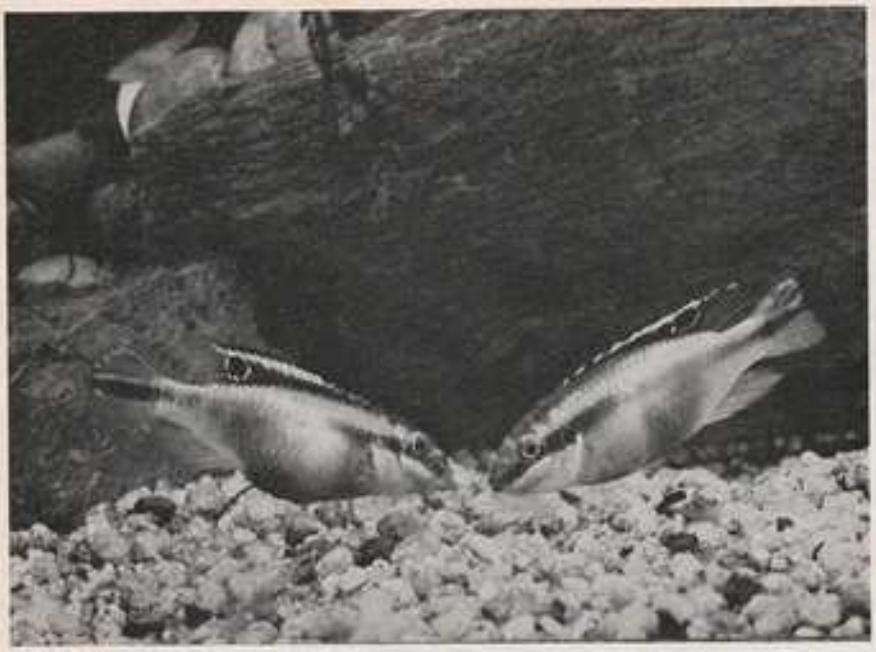
By RUDOLPH ZUKAL

Photographs by the author

THE correct classification of this fish, known for so long under the name *Pelmatochromis kribensis*, exercised the authorities, as we know, for very many years. It is no wonder that the confusion arose. The fish described by Boulenger in 1911 as *Pelmatochromis kribensis* was identical with *P. taeniatus* (Boulenger 1901); then the two species *P. subocellatus* and *P. kribensis*, and probably some others, were confused with each other (not surprisingly perhaps since according to Boulenger the genus *Pelmatochromis* contained 37 species, or 20-22 according to the revision by T. Regan). Finally, in 1945, fish looking very much like *P. subocellatus* were imported into Europe and named *Pelmatochromis kribensis* after the name of their home river, the Kribi, in the Cameroons.

However, I do not propose to detail that story further but will devote myself to the more practical aspects of caring for and breeding this small representative of the vast cichlid family. In its home territory (tropical West Africa at the delta of the Niger and Kribi rivers) *Pelvicachromis pulcher* grows to about 4 in. (10 cm.) but it remains much smaller in our aquarium tanks.

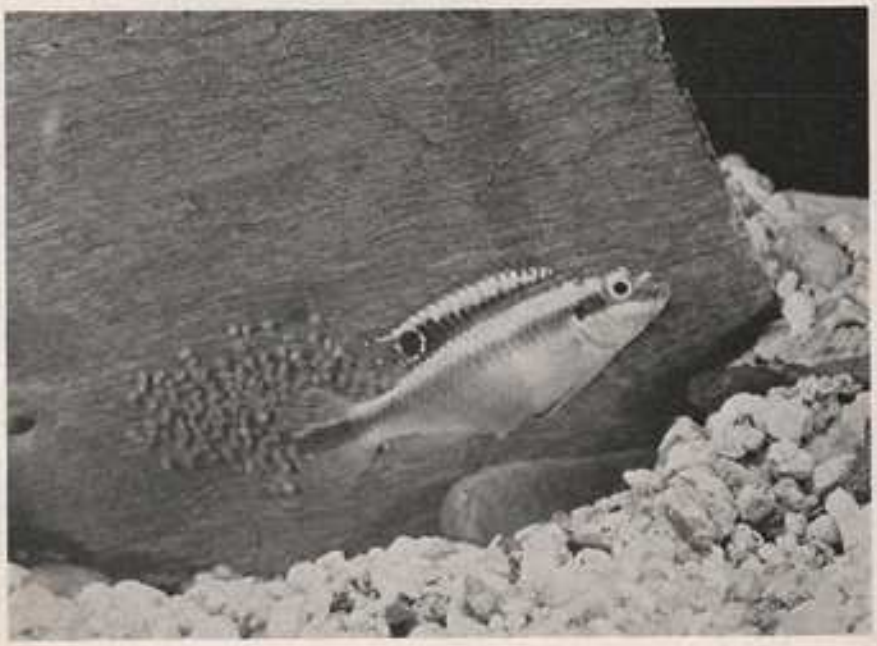
Translated by F. MARSH



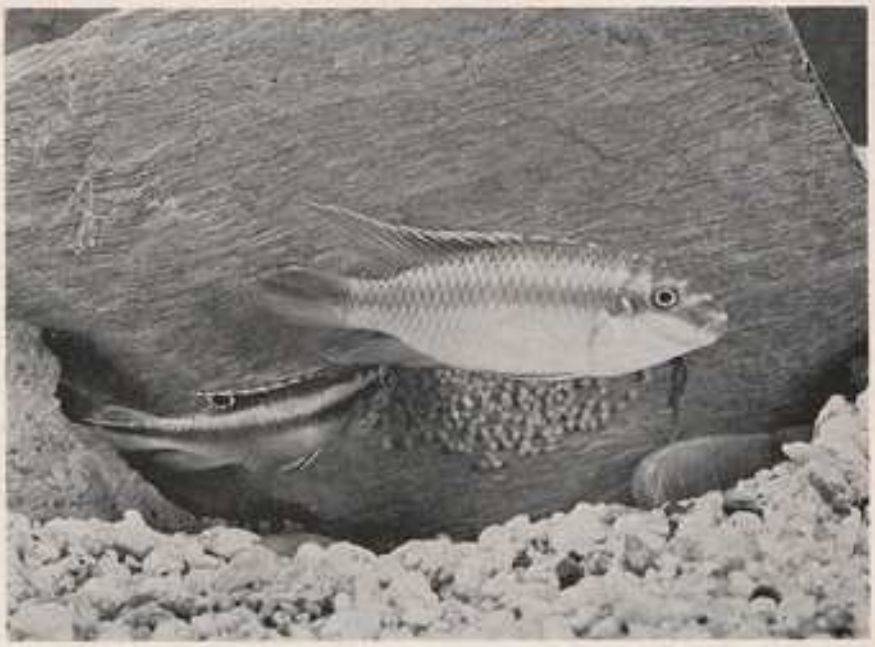
Two female 'kribensis' dwarf cichlids in aggressive display. On the preceding page the pair of fish are shown with eggs

Because of this manageable size, and of course because of its beautiful colouring, it has become one of our most beloved cichlids. Then, its peaceful nature also goes a long way in its favour and it is even possible to keep individual pairs in the community tank — though their tendency to dig has to be reckoned with — this is their bad point! However, provided they are given plenty of possible hiding places at least they will not dig haphazardly all over the tank. They require a temperature of at least 70–75°F (22–24°C).

The male is the slimmer, longer fish



During spawning: the extruded triangular ovipositor of the female fish can be seen in this side view



During spawning: male and female change positions as eggs are laid and then fertilised. Both parents guard the eggs, and the fry when these are transferred to a pit made in the gravel

with a broader head. Silvery/golden glinting stripes border the dorsal fin up to its tip. On the upper part of the caudal fin are one to five round dark flecks bordered in bright yellow. I will forego a more detailed description since fish of this species often vary quite considerably in coloration and do not all look alike. With excitement the fins of the fish become a violet colour. The female is always more intensely coloured and has a large, wine-red area on the sides of the body. The ventral fins are also wine-red. Young fish do not show this colour pattern.

As I have said, individual pairs can be kept in the community tank though this should be large and well-planted. The tank water must not be hard. They are fast swimming fish, and fight a bit amongst themselves; they are not interested in other species, though they will guard their eggs against others. All live food is acceptable and they also require algae.

When I set up the tank to photograph the spawning, I used a 14-gallon (60 litre) tank. I leaned a piece of slate against two rocks to form a sloping surface with room for the fish to turn, since they spawn in a diagonal position, belly upwards. On the base I put coarse sand and scattered small stones over it. I used tap water but my tap water is only 8–10 degrees DH and it is not at all hard. The temperature was raised to 82.5°F (28°C) and after a further 3 days the selected pair were put in.

The fish were very shy. When my patience became exhausted I put in another female and another male. The females immediately attacked each other and the males also fought but the fight did not last for long. The inferior female and the weaker male were taken out after a few minutes and the victorious couple left in the spawning tank. It did not take much longer; the third day after the incident the female laid her eggs. Both parents guarded the eggs and I left these in their care.

FILTRATION REVIEW—1

What Should a Filter Do?

By CLIFF HARRISON

FILTRATION has become a vital aspect of fishkeeping, not least because of the undeniable attraction of aquaria that are kept crystal clear to display the living occupants at their best. There are so many filters on the market nowadays, in a wide range of designs and prices, that selection of the most suitable model for one's particular requirement can be almost impossible without some understanding of the working of the various types.

When we talk about filtration in the home aquarium, what we really mean is 'water purification', i.e., the equipment provides means to modify both the physical and chemical content of the water. Aeration is also a process with which filtration is usually directly linked since air pumps are commonly used to provide the power needed to move the water through the filter. It is worthwhile reiterating here that although the term 'aeration' is used to indicate the process of maintaining the maximum possible dissolved oxygen content of the water, it is a practice that should never be used solely to enable more fish to be kept in a given volume of water than would be possible without it.

To be able to appreciate the role of filtration, we should first look at how water purification is achieved in Nature. The first way is through replacement: a body of water is constantly supplied with fresh, unpolluted water from a natural spring, or from the higher reaches of a stream or river where it has a relatively low content of impurities. The waste products from the fish, along with degraded substances from dead vegetation and other matter, are then carried away downstream. Whilst such a method involving flowing water might be applied under some circumstances to coldwater fishkeeping for ponds and aquaria, it does not readily lend itself to use in tropical conditions: the cost of maintaining the supply at a suitable temperature would be prohibitive. However, circulating the aquarium water through a filter equipped to purify the water is practically the next best thing to such an 'open system'.

The second natural process is biological purification, in which bacteria are involved. These micro-organisms are to be found in all natural waters and they maintain life by breaking down animal and vegetable matter—for example by converting poisonous nitrogenous substances into nitrates, which are harmless in moderation and do in fact provide an essential form of nourishment for water plants. Like fish, the particular types of bacteria in which we are interested ('aerobic bacteria') need ample supplies of oxygen dissolved in the water if they are to thrive; since there is usually only a relatively low density of fish and small amount of waste matter to be broken down in most stretches of water, a sufficient number of bacteria can live and in performing their natural functions maintain the water pure and fit for aquatic life. In fact, this is a process that we can rely on in the home aquarium without further sophistication provided we duplicate the conditions in Nature: namely, by restricting the number of fish kept in an aquarium to just a fraction of its normal capacity, and feeding in moderation. Naturally enough, not many people would be happy with this arrangement, which could be regarded as a waste of tank space. A slightly greater number of fish than this could be kept by the addition of aeration to the aquarium, which speeds up the bacterial processes, but even then a point is reached where the simplest aquarium set-up does not provide the best conditions for water-purifying bacteria. At this point we can learn a lesson from large-scale water purification methods: the idea is to cultivate enormous colonies of bacteria in thin layers over the surfaces of an inert supporting material. Commercially, clinker or coke is the most suitable, but in the aquarium we can use the base medium — gravel. By drawing water

through the gravel, bringing dissolved oxygen with it to support the colonies of bacteria forming around the individual particles of stone, we have created a very effective method of water purification. This flow of water through the gravel can be achieved by placing a perforated plastic plate or a system of perforated plastic tubes, linked to an air-lift, on the bottom of the aquarium before the gravel is put in. To work efficiently the gravel should be fairly coarse —say between ¼in. and ½in. grade—and of a depth of at least 2in. and preferably rather more.

If the 'underground filter' is correctly operated, this is a method that allows very near to the tank's maximum capacity of fish to be kept, almost indefinitely, provided that they are not fed too heavily. Periodically it is wise to remove a portion of the aquarium water and replace with fresh (at the correct temperature); this will prevent a build-up of nitrates or other chemical salts in the water which might, if in excessive quantity, eventually be harmful to the fish. One sign of a build-up of these unwanted chemicals in the aquarium is when the water is seen to have a pale golden-yellow colour when viewed in a bright light. Such a change of water is something that is beneficial to almost all fish, regardless of the type of filtration used. For an aquarium stocked near its maximum capacity, the change of about one eighth of its content every week or two is greatly appreciated by the occupants—'change' is the important principle, not just 'replacement' or the making good of water evaporation.

Of course, filtration was being used in the aquarium tank before the principles of natural biological filtration were commercially applied, the emphasis being placed on 'mechanical filtration'. This involves passing the aquarium water through a suitable filter medium to remove the suspended solid particles from the water. The filter medium performing the simplest function is nylon floss or glass wool, which traps and retains the solid particles. Even particles as small as micro-organisms can be removed by the finest type of medium in the correct filter. 'Activated carbon' is a medium that can be used additionally to remove certain of the dissolved substances, and with the more recent development of special 'exchange resins' as further filter material, water conditions suited to the requirements of the most difficult of fishes can now be achieved.

These filters come in a wide range of styles: some are designed to fit inside the aquarium, others clip on to the outside of the top frame and others can be located some distance away. Most rely on a supply of air (from an air pump) for their operation, but some of the most expensive types have their own self-contained water pump, powered by a small mains electric motor.

The air-operated filters use what is known as an 'air-lift' to draw the aquarium water through the filter medium. An air-lift is simply a length of plastic tube kept upright in the aquarium, and which has a steady supply of air admitted near the lower end. As the bubbles of air rush upwards towards the surface they 'lift' water up with them. There are various designs of air-lift, some employing an air stone and a wider bore of plastic tube to give an increased flow of water, and those used for outside filters have a bend at the top to fit over the aquarium frame.

Those filters in which the water does not have to be lifted above its own level are likely to be the most economical on air and to have the highest flow rate: undergravel filters and bottom filters come into this category, though in shallow aquaria the plastic tubes may have to be cut down to keep them at least 1 in. below the water surface for maximum efficiency.

In the next article the full range of types of aquarium filters will be discussed, to aid selection of the ones most suited to specific requirements.

What's New?

SPECIFICALLY of interest to retailers are the live foods for fishes available from the wholesalers C. J. Skilton Aquarist, Great Gibcracks Chase, Butt's Green, Sandon, Chelmsford, CM2 7TR (phone Chelmsford, 0245, 400525). The range of foods shown in the firm's Live Foods Catalogue includes live brandling red earthworms, and deep-frozen, irradiated, sea plankton, common limpet, shell meat, mussel meat, scallop meat, shrimps, mysis shrimp, brine shrimps, crab, silver fish, bloodworms and daphnia.

The Aquarium 'Flying Fox'

By BRAZ WALKER

Photograph by the author

TRADE names are often equally as colourful as or even more so than the fishes they represent. Some are borrowed from vernacular names used by the people native to the homeland of the fish involved, such as the famous *humuhumunukunuku-apua'a*, which is used in the aquarium trade for *Rhinecanthus rectangulus* and *R. aculeatus* and in Hawaiian means "trigger fish with a nose like a pig" (*humuhumu*, which means "to fit pieces together", is used for all members of the family Balistidae). Others are given by collectors or wholesalers to be of some descriptive value or to perhaps add a bit of appeal and enhance sales. A 'black shark' is obviously more appealing than if the same fish had been more accurately called 'black carp'. The resemblance, however, is there, somewhat legitimising the name. Other names, equally romantic in their appeal, seem to call for something beyond imagination.

Any resemblance between the flying fox, *Epalzeorhynchus kalopterus*, and the real thing, defies my imagination. The *real* flying fox is the huge fruit bat of South-east Asia, whose 4 foot wingspread would seem enough to make Count Dracula himself a bit envious. Our piscine namesake for this largest leatherwinged mammal is instead one of the more diminutive members of the family Cyprinidae and belongs to the group among them which is known as 'fringe-lipped fishes'.

Epalzeorhynchus kalopterus (Bleeker, 1851), the flying fox, is native to Borneo and Sumatra and is found more rarely in Thailand. This is a striking fish with an elongated, cylindrical body adorned from snout to the middle caudal or tail fin rays

by a bold, black stripe or band. The belly, in contrast, is white, and above the dark band is a handsome golden-yellow band which also extends from snout to tail. The back is olive green to deep green when the fish is at its best, and this sometimes lightens to golden brownish, especially when the fish is kept over a light-coloured bottom covering. There is a dark band on the dorsal fin, with similar bands on the ventral and anal fins, over which the fins are flushed with pink. The pectorals are pink or reddish, and the caudal base is the same. The upper iris is red, and the boldness and placement of the markings give an overall impression of taste and dignity in full uniform.

The flying fox presents few difficulties in keeping. Its presence is prominent, and it is rather territorial in nature towards its own or very similar species such as *Epalzeorhymchus siamensis*, which is sometimes called the 'Siamese flying fox' or the 'poor man's flying fox'. With other fishes, however, there is little competition for the most part, although there may be occasional squabbles with fishes such as redtail black sharks (*Labeo bicolor*) or redfin or rainbow sharks (*L. frenatus* and *L. erythrurus* respectively).

Water conditions are not apparently critical, for maintenance at least, and the fish lives for years with good care in moderately hard to rather soft water. Soft water, however, would be definitely recommended for breeding attempts, and it is probable that an addition of peat extract or peat filtration would be desirable. A wide range of temperature is also tolerated, although the fish is at its best at about 75-80°F (24-27°C).

This fish and its relatives are primarily algae and detritus feeders in Nature. In the aquarium, flying foxes graze over the surface of plants, rocks and grasses, rasping algae and other substances from them with their fringed lip. In addition, almost all fish foods, whether live, frozen or prepared, will be eaten. Another asset of this fish is its fondness for planarians, the tiny flatworm pests that occasionally plague an aquarium, covering aquarium walls and becoming quite unsightly. The flying fox is one of the few effective eliminators of these creatures.

One of the peculiarities of the flying fox is its rather odd resting position. It often 'perches' on a plant leaf or other object, propped up by its pectoral fins, and also rests on the bottom in the same manner, using these appendages almost as if they were landing gear. While this is certainly not a shy fish if provided with a large and well-furnished aquarium to its liking, it has moments of solitude which it prefers to spend obscured among roots or plants.

This is not what could be considered a commonly imported fish, although availability in the U.S. and in England seems to have increased in the last few years. Breeding in aquaria has not been reported to my knowledge, although a record of this could have been overlooked.

The flying fox apparently reaches a length of approximately 15 cm., about 6 inches, in Nature, and usually a bit less in the aquarium, perhaps 10 cm. (about 4 inches).

It would seem that as with other similar-sized and related fishes of somewhat similar habit, provided with suitable conditions and a suitable diet, spawning condition would be reached. Provided a pair found each other compatible, the flying foxes would take over from there. A good approach would probably be similar to setting up for spawning redfin or redtail sharks. Since flying foxes are competitive and quarrelsome among their own kind, it may be best to distribute five or six among various aquaria before bringing them together. This has the added advantage of keeping growth rates near the same, which will not occur where one fish dominates.

A 15 or 20 gallons aquarium containing soft, moderately acid water and provided with rocks, caves and planting, should be suitable. Water should be warm, 82°F (27-28°C), and well aerated and filtered. Spawning would seem likely to occur beneath a ledge or in a cave, or possibly in an evacuated 'nest' or depression. Parental care by one or both parents is likely, according to reports on similar species.

Epalzeorhymchus kalopterus, the flying fox, is a showy fish with few faults. Its vital nature seems summarised in the manner in which it carries its fins: never at half-mast, always set for full sail. This seems appropriate, for this is the feature for which the species was named (*kalopterus*) — beautiful fin).

Compatible even with those smaller than itself, the flying fox is a choice fish for those who appreciate medium-sized cyprinids.

TROPICAL AQUARIUM FLOATING PLANTS

Photographs

by

W. A. TOMEY

The Water Fern (*Ceratopteris thalictroides*)

ONE of the most popular floating plants for tropical aquaria is the water fern (*Ceratopteris thalictroides* var. *cornuta*), coming originally from Africa and south-east Asia. It is strictly a tropical plant and must be kept in warm conditions. It is peculiar in forming new small plants directly on the old leaves, as can be seen in the pictures (the new leaves show up clearly as they are lighter in hue). Fish fry are well protected in the thick leafy masses of this surface plant.

Top: view of an entire plant on the water surface

Right: a single old leaf of water fern bearing a number of new fern leaves and their long thin roots. The stems of the plant have large air-spaces within them that give the fern its buoyancy

A Hardy Fish for the Pond

By FRANK ORME

FOUND in similar still waters to those enjoyed by carp, the tench can tolerate conditions that would cause discomfort to even the hardy carp. It is our most sluggish of native freshwater fishes and will prosper in weedy, muddy pools if the need arises. Tending to avoid light, it spends the hours of daylight hidden in the mud or amongst the weeds. Occasionally, if it is a warm calm day, it may rise to the surface to lie motionless beneath a lily pad, but if disturbed it will immediately dive back to the shelter of the mud or underwater vegetation. Normally, the tench prefers to make its excursions during the night, when it will browse on the plant life and eat worms, insect larvae, snails and any other food that is easily caught. In other words if the food is slower in movement than the slothful tench, and is small enough, it will be eaten.

Distinguished from other members of the family of cyprinoids by the many small goldenish scales along the lateral line, the tench rejoices in the title of *Tinca tinca*. The rounded back and rather stout appearance gives an impression of a cylinder. The snout is short, with an oblique mouth that has a small barbel each side, near the corner. All fins, including the tail, are rounded, varying in colour from deep olive to blackish brown. There is also an ornamental golden variety of tench. Covering the body is a mucus that makes the fish very slimy; this sliminess gave rise to a belief that injured or ailing fish cured themselves by rubbing against the tench — this false belief causing the fish to be known as the 'doctor fish'. The average weight of an adult tench, in England, is 8 lbs.

Like the carp, the tench spends the winter months in a torpid condition at the bottom of the pond or lake. Safe only in very weedy waters, it will be quickly exterminated if pike find their way in — being too slow to avoid the jaws of this predator.

One of the latest spawners of British freshwater fishes, tench breed between April and August. Spawning is not a continuous act but takes place over a period, with several intervals. A female can produce around 300,000 eggs; these are small and are deposited amidst plants in shallow waters, where they are fertilised by the male. Under favourable conditions the eggs will hatch in a few days, the young developing quickly. Young tench can grow to around a weight of ¼lb. in the first year.

Being such a hardy fish, and tolerant of poor water conditions, the tench is quite suitable for inclusion in the garden pool. Although it may not often show itself it will, no doubt, employ itself usefully by clearing up any food that has been overlooked by the more colourful and active fishes. It may not act as 'doctor' to the other occupants of the pool but, by scavenging, it will help to remove possible sources of pollution. It should be given adequate quarters in a sensible size of pool — no fish can be expected to do well in some of the small pre-formed pools that are offered for sale. These are so restricted that insufficient swimming space is available and the fish stand little chance of escaping the attention of cats, or other predators. Pollution is also a very real danger. During very hot weather the small volume of water will quickly overheat and this, due to the resultant lack of dissolved oxygen, can lead to the death of the fish. A fish that can reach a length of 10 inches needs space to develop properly and not be stunted!

Although the local pet shop is unlikely to be able to offer tench for sale, very often, during the season, the large aquatic nurseries will be able to supply the golden variety. The wild type tench can possibly be caught with patience by fishing at night with a worm or paste-baited line. Or you can attempt to find the fish lying in shallow water, and drive a wide-mesh net in a

scooping action, from the deep water side towards the bank, and lift the fish from the water. The tench is so sluggish this should not be a difficult task. In fact it may not even struggle. The problem lies in finding a fish in a suitable spot to be netted! Obviously, if capture is to be successful, no sudden movements must be made otherwise the intended quarry will head for the protection of deeper water. Although it is tenacious of life and can survive a period in the open air, every effort should be made to return it to its natural element with as little delay as possible.

As always, quarantine the fish and make absolutely certain that it is in a good strong healthy condition, free of disease and parasites, before liberating it into the permanent home. This caution applies to all new acquisitions irrespective of the source from which they were obtained. Given correct treatment and suitable quarters, the tench will prove to be a long-lived fish and this will, perhaps, compensate for the lack of activity and colour.

For those who either do not have a pool or prefer to see their pets, a large tank will be quite suitable for housing tench. Exercise the usual maintenance chores and feed them with earthworm, whiteworm, crushed snails, together with any of the normal goldfish foods, and the fish will be quite content to settle down to the protected and pampered life of an aquarium inmate.

Club News

MEMBERS of the **CATFISH ASSOCIATION GREAT BRITAIN** were delighted with their results of The Aquarium Show '75. The Supreme Championship was won by member Mrs M. Nethersell with a *Synodontis clarias* and she also took sixth place with a *Brochis coeruleus*. Other successes at the Show were: Catfish pairs: 1, Mrs G. Sandford (*Ottocinclus vittatus*) and 3, Mrs M. Crewe (*Hoplosternum thoracatum*); special class, 3rd, Mr M. Sandford (*Clarius angolensis*). A number of catfish were raffled at the Show and the winners were: Friday, Mrs M. Nethersell (2-spot pink bagrid); Saturday, Mr J. Brooke, Huddersfield (*Pterygoplichthys multiradiatus*); Sunday, 1, Mr Cooper (*Pimelodus maculatus*); 2, Mrs Crewe (*Dianema urostriata*); 3, Mr Piggott (*Ancistrus species*). Meetings of the Association are held every two months on the second Monday of that month (next meeting: 12th January) from 8-10.30 p.m. at St. Saviours Church Hall, Cobbold Road, London, W.12. Anyone interested is welcome.

OUT of a record entry of 834 entries, almost 800 fish were actually benched at the **NEWBURY & DAS** Open Show. First-award winners received a trophy and card, with ashtray and card for those placed second, keyring and card for third place and a card for fourth place. The society achieving most points was Kingston & DAS and they received a gavel and block. Mr W. A. Knight of Gosport won the Best Fish in Show trophy for a Rift Valley cichlid and Mr Knight also won the **FBAS** Championship trophy. Results of the 37 classes were:

A: 1, Mrs G. Rushbrook (Reading); 2, Mr J. Jupe (Gosport); 3, Mr R. J. Hard (Haslemere); 4, Mrs G. Barrett (Newbury). Ba: 1, Mr M. West (Kingston); 2, Mr R. F. Adams (Salisbury); 3, Mr A. Chaplin (Basingstoke); 4, Mr R. Canning (Newbury). Bz: 1, Mr M. Carter (Southampton); 2, Mr T. Burvill (Basingstoke); 3, Mr M. Dore (Reading); 4, Mr L. Yates (Petersfield). Ca: 1, Mr R. Onslow (Basingstoke); 2, Mr I. J. Lecky (Basingstoke); 3, Mr J. Jackson (Basingstoke); 4, Mr T. Woolley (CAGB). Cb: 1, Mr C. Turner (Cardiff); 2, Mr J. A. Pollard (Kingston); 3, Mr M. Strange (Basingstoke); 4, Mr P. Rushbrooke (Reading). Cz: 1 & 3, Mr M. West; 2, Mr A. Weiare (Southampton); 4, Mr A. C. Tull (Salisbury). Da: 1, Mr R. Canning; 2, Mrs Newbury (Gosport); 3, E. & T. Tester (Mid-Sussex); 4, Mr K. B. Connelly (Gosport). Db: 1, Mrs Newbury; 2, 3 & 4, Mr M. Carter. Dc: 1 & 3, Mr W. A. Knight (Gosport); 2, Mr K. B. Connelly; 4, Mr & Mrs R. Houghton (Mid-Sussex). Cz: 1, Mr D. J. Turner (Gosport); 2, Mr R. Canning; 3, Mr R. F. Adams (Salisbury); 4, Mr A. F. Gibson (Reading). Ea: 1, Mr M. Carter; 2 & 4, C. & J. Richards (Sudbury); 3, Mr B. Young (Newbury). E: 1, Mr P. Brown (Southampton); 2, Mrs V. J. Lloyd (Independant); 3, Mr A. Chaplin; 4, Mr R. Canning. F: Mr R. Canning; 2, Mr P. Brown; 3, C. & J. Richards; 4, Mr D. J. Jackson (Salisbury). G: 1, Mr D. Shendan (Newbury); 2, Mr F. Farnell (Tonbridge); 3, Mr C. Turner (Cardiff); 4, Mr W. Onslow (Kingston). H: 1, Mr M. Carter; 2, Mrs K. Clarke (Gosport); 3, Mr F. Farnell; 4, Mr P. Rushbrooke. J: 1, Mr C. & J. Richards; 2, Mr F. Timmins (Gloucester); 3, Mr T. Woolley (CAGB); 4, Mr C. Turner. K: 1, Mr M. Strange; 2, Mr R. Onslow (Basingstoke); 3, Mr S. Bartlett (Sudbury); 4, Mrs Newbury. L: 1, Mr C. Turner; 2, Mr A. C. Tull; 3, Mr J. A. Pollard; 4, Mr K. Hillier (Newbury). Ma: 1, Mr K. B. Connelly; 2 & 3, Mr D. B. Purchard (Tonbridge); 4, Mr F. Timmins (Gloucester). Mz: 1,

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ON Sunday, 14th March a Seminar for Koi Keepers will be held at the Post House, Leicester, starting at noon. An extremely interesting programme has been planned with three specialists speakers invited to lecture on three major subjects close to the heart of all koi keepers — fish diseases, fish diet and pond construction. Each lecture will be an hour in length with a similar time allotted after the lecture to discussion from the floor. Further details will be appearing in these columns before the Seminar takes place, but should further information be required please contact Mr R. Seal at 7 Highlands Road, Offerton, Stockport, Ches, SK2 5HU or Miss Frost, 75 Edward Street, Southborough, Kent.

Mrs V. J. Lloyd; 2 & 4, Mrs E. Dibley (Newbury); 3, Mr C. Turner. **NB-M**: 1, C. & J. Richards; 2, Mrs E. Dibley; 3, Mr A. Weiare; 4, Mrs J. Ellis (Kingston). **NO-T**: 1, Mr E. H. Pankhurst (Bracknell); 2, D. Kenwood (Nailsea); 3, Mr R. Canning; 4, Mr T. Woolley. **O**: 1 & 2, Mr A. Noronha (Orpington); 3, Mr D. J. Turner (Gosport); 4, C. & J. Richards. **P**: 1, C. & J. Richards; 2, Mr M. J. Myers (Newbury); 3, Mr J. Randell (Haslemere); 4, Mr T. Woolley. **Q**: 1, Mr T. Burgill (Basingstoke); 2, Mr R. Scaplehorn (Newbury); 3, Mr I. Pierce (H. Wycombe); 4, Mr A. Noronha. **R**: 1, Mr Onslow; 2, Mr J. Randell; 3, Mr A. Noronha; 4, Mr F. Timmins. **S**: 1, E. & T. Tester (Mid-Sussex); 2, Mr J. Jackson (Basingstoke); 3, Mr R. F. Adams (Salisbury); 4, Mr T. Woolley. **T**: 1, Mr A. Noronha; 2, Mr M. Carter; 3, Mr J. Randell; 4, Mr M. Strange. **XB-M**: 1, Mr C. Turner; 2, Mr K. B. Connelly; 3 & 4, Mr A. Noronha. **XO-T**: 1, Mr C. Turner; 2, Mr M. Bishop (Bishops Cleeve); 3, Mr I. Pierce (H. Wycombe); 4, Mr & Mrs E. Lough (Kingston).

XU-W: 1 & 3, Mr T. Longstaff (Kingston); 2, Mr T. Woolley; 4, Debbie & Darren Longford (juniors, Haslemere). **Usd**: 1, Mr F. Pinder (Independant); 2 & 4, Mr J. Randell; 3, Mr D. J. Mackay (Kingston). **Ubc**: 1, Mr D. J. Hard (Haslemere). **V**: 1, Mr T. Longstaff (Kingston); 2, 3 & 4, Mr J. A. Pollard. **W**: 1, Mr J. Jupe; 2, Mr J. Randell; 3, Mr T. Longstaff; 4, Mr B. Wett (Kingston). **Y**: 1 & 2, Mr M. J. Ellick (Nailsea); **Z**: 1, Mrs J. Ellis; 2, Mr J. Jackson (Basingstoke); 3, Mr C. G. McHay (Sudbury); 4, Mr J. A. Young (Independent).

THE organisers of **VAUXHALL MOTORS AS** Open Show would like to thank the FBAS and the judges for all their help at the show, the results of which are as follows:

Ba: 1, Mr & Mrs Crew (Wellingborough); 2, Miss Yearsdon; 3, Mr B. King (Vauxhall); 4, Mr J. Halley. **Bz**: 1, Mr T. Woolley (Saracens); 2, Mr P. Moye (Sudbury); 3, C. & J. Richards (Sudbury); 4, Mr & Mrs Crew. **Ca**: 1 & 2, Mr Brazier (Sudbury); 3, Mr A. Worth (Dunstable); 4, Mr P. Moye. **Cb**: 1 & 2, Mr Brazier; 3, Mr S. Bartlett (Sudbury); 4, C. & J. Richards. **Cz**: 1, Mr D. Luxton (Vauxhall); 2, Mr P. Moye; 3, Mr Brazier; 4, Mr R. Sintfield (Vauxhall). **D**: 1 & 4, Mr P. Butt (WADAS); 2, Mr A. Worth (Dunstable); 3, Mr J. Halley. **Da**: 1, Mr K. Usher (Doncaster); 2, Mr W. Davidson (Vauxhall); 3, Mr R. Marshall (NADAS); 4, Mr J. Abbit (Dunstable). **Db**: 1, Mr & Mrs Oakley (Dunstable); 2, Mr S. Bartlett; 3, Mr & Mrs Tilley (Saracens); 4, Mr Brazier. **Dc**: 1, Mr P. Moye; 2, Mrs A. Philip (Vauxhall); 3 & 4, Mr B. Rumney (Vauxhall-Mid-H). **E**: 1, Mr R. Rowland (Dunmow); 2, Mr B. Barford (Saracens); 3, Mr A. Thacker (Vauxhall); 4, Mr R. F. Thoday (Dunmow). **Ea**: 1 & 4, Mr A. Thacker; 2, C. & J. Richards; 3, Mr T. Woolley. **F**: 1 & 4, Mr & Mrs Crew; 2, C. & J. Richards; 3, Mr R. F. Thoday (Dunmow). **G**: 1, Mr R. F. Thoday; 2 & 3, Mr P. Moye; 4, Mr & Mrs Tilley. **H**: 1, 2, 3 & 4, Mr P. Moye. **J**: 1 & 4, Mr R. F. Thoday; 2, Mr P. Moye; 3, C. & J. Richards. **K**: 1, Mr P. Moye; 2, Mr R. Onslow (Kingsclere); 3, Mr A. Thacker; 4, C. & J. Richards. **L**: 1, Mrs S. Moore (HHAS); 2, Mr A. Thacker; 3, Miss Yearsdon (HHAS); 4, Mr A. E. Noronha (Orpington). **M**: 1, Mr R. F. Thoday; 2, Mr Brazier; 3, Mr & Mrs Crew (WADAS); 4, Mr A. Thacker. **NB-M**: 1, C. & J. Richards; 2, Mr P. Moye; 3, Mr H. J. Foxlee-Brown (Roehampton); 4, Mr A. Johnson (Kingsclere). **NO-T**: 1 & 2, Mr K. Usher (Doncaster); 3, Mr J. Abbit; 4, Mr T. Woolley (Dunstable). **NF**: 1, C. & J. Richards; 2, Mr A. Worth; 3, Mr S. Bartlett (Sudbury).

O: 1 & 3, C. & J. Richards; 2, Mr & Mrs Crew; 4, Mr A. E. Noronha. **P**: 1 & 4, Mr H. J. Foxlee-Brown; 2 & 3, Mr T. Woolley. **Q**: 1, Mr K. Usher; 2, Mr D. Luxton; 3, Mr B. Meech (Dunmow); 4, Mr R. F. Thoday. **R**: 1, Mr R. Onslow; 2, Mr A. E. Noronha; 3 & 4, Mr M. Tearle. **S**: 1, Mr R. Moye; 2 & 4, Mr B. Manning (Roehampton); 3, Mr D. Luxton. **T**: 1, 2 & 4, Mr K. Usher; 3, Mr A. E. Noronha. **XO-T**: 1 & 4, Mr K. Usher; 2, Mr P. Moye; 3, Mr D. Luxton. **XB-M**: 1, Mr P. Moye; 2, Mr R. F. Thoday; 3, Mr A. E. Noronha; 4, Mr & Mrs Crew. **Z**: 1, Mr Brazier; 2, Mr J. Halley; 3, Mr J. C. Baines (Vauxhall); 4, Mr A. Philip (Vauxhall). Junior: 1, P. Philip (Vauxhall); 2, Miss Church (HHAS); 3, R. Woolley; 4, Helen Thacker.

MR F. UNDERWOOD, secretary to the **MIDLAND AQUARIST LEAGUE** reports, "The final show of 1975 for the MIDLAND AQUARIST LEAGUE took place in October at Bulkington Parish Hall, Bulkington. The show was well supported with 222 entries and despite a strong challenge by the Leamington Society, they were unable to take the overall lead away from Coventry. Although the league finished financially even for the year, plans are being formed to revise the shows for this year in an attempt to combat rising costs. Best in show was awarded to Mr & Mrs Chambelain (Leamington) for a fire eel (80 points). Individuals gaining the most points for the year were Mr & Mrs Short of Hinckley & DAS (58 points) and they were awarded the R. & R. Tedds trophy. Special thanks were expressed to the MAAS judges for their services during the year. Total league points for the year are as follows: Coventry Pool & AS, 98; Leamington DAS, 75; Hinckley DAS, 67; Bedworth A & PS, 50; Loughborough & DAS, 36; Rugby Fishkeepers, 19; Goodyers End AS, 15."

WHEN the Coldwater Open Show of **BRISTOL AS** took place the entries totalled 315 and came from as far afield as Lancashire, Essex, Surrey, Devon and South Wales. The main prizes were taken by the following: the Best Exhibit, Mr B. M. Rothwell; Highest number of points, Mr F. Orme; Best Fancy Fish, Mr A. E. Roberts; 2nd Best Fancy Fish, Mr D. S. Langdon; and the Best Shubunkin, Mr R. Oxenham. Full results as follows:

Goldfish 5in. limit: 1 & 3, Mr R. J. Pinnock; 2, Mr S. Lloyd; 4, Miss Rupert. Bristol shubunkins 3in. limit: 1 & 3, Mr H. J. Whiting; 2, Mr A. J. Churchill; 4, Mr R. J. King. Bristol shubunkins over 3in. not exceeding 5in.: 1, Mr D. S. Langdon; 2 & 3, Mr G. K. Jennings; 4, Mr H. J. Whiting. Veiltails: 1, 2, 3 & 4, Mr F. Orme. Moors: 1, 2, 3 & 4, Mr A. E. Roberts. Telescopes (other than moors), lionheads, celestails, bubble eyes: 1 & 3, Mr S. Lloyd; 2 & 4, Mr F. Onne. Orandas: 1, Mr S. Lloyd; 2 & 4, Mr D. Headford; 3, Mr C. Becker. Nymphs, comets and London shubunkins: 1 & 3, Mr W. Leach; 2 & 4, Mrs P. Whittington. Fantails, scaled: 1, Mr W. H. Ramsden; 2 & 4, Mr G. E. Herring; 3, Mr R. Davis. Fantails, calico: 1, Mr C. R. Packer; 2, Miss Rupert; 3, Mr G. H. Herring; 4, Mr R. J. Pinnock. Koi, any pond or river fish 9in. limit: 1, Mr L. Mennennet; 2, Mr C. R. Packer; 3, Mr V. Cole; 4, Miss Rupert. Bristol shubunkins bred 1975: 1, Mr R. Oxenham; 2, Mr B. M. Rothwell; 3 & 4, Mr G. J. Bell. Moors bred 1975: 1 & 2, Mr A. E. Roberts. Any Fancy fish bred 1975: 1, 2, 3 & 4, Mr F. Orme. Breeders class team of 4, bred 1975, Bristol shubunkins, comet, goldfish: 1 & 2, Mr B. M. Rothwell; 3 & 4, Mr V. Cole. Breeders class team of 4, bred 1975, veiltails, moors, fantails: 1 & 3, Mr R. J. King; 2, Mr F. Orme; 4, Mr K. R. Forward. Bristol shubunkins matched pairs 5in. limit: 1 & 3, Mr H. J. Whiting; 2, Mr D. S. Langdon; 4, Mr A. J. Churchill. Novice class Bristol shubunkins 5in. limit: 1, Mr V. Cole; 2, Mr R. J. Bennett; 3, Mr D. C. Barnes; 4, Mr C. Summers. Furnished aquaria: 1, Mr G. J. Bell.

MR I. J. BANGHAM, P.R.O. of **HUDDERSFIELD TROPICAL FISH SOCIETY** reports, "On the first weekend in November we held a unique double bill starting on the 1st with an auction of fish, plants and equipment. Our auctioneer, Dr P. A. Lewis, once more gave us a sparkling performance which not only sold fish but entertained as well. We had an attendance of well over 100 people at a very successful auction which sold about £150 worth of goods. Then on the 4th we held an Open Evening where members of the public were invited to come and see demonstrations on tanks and how to make an

undergravel filter, plants, rocks and general tank decor, fish, fish foods (and how to culture your own); also tank care and maintenance. This venture was organised and carried out by the members of the committee. The evening was a great success attracting some 90 or so people who, by the end of the evening we hope, knew more about fish and fishkeeping than they did before they arrived. The completed tank which was made during the evening was raffled off to the delight of the winner who carried it off complete with fish. We would like to thank Animal Magic, B.T. Foden, H.A. Tropicals, K.L. Gill and Outlane Aquarium who kindly provided all the equipment which went into the tank and without them the evening would not have been possible."

AT THE Dagenham Town Show run by **ROMFORD & BEACONTREE AS** there were 177 entries and 7 clubs took part. The FBAS judges presiding were Mr C. Creed, Mr R. Esson and Mr R. Wigg. Results are as follows:

A: 1, Mr T. Kuderovitch (Bethnal Green); 2, Mrs S. Hedges (Bethnal Green); 3, Mr R. Victory (Romford). **B**: 1 & 2, Mr D. Durrant; 3, Mr K. Wrighton; 4, Mr D. Byfield. **C**: 1 & 4, Mr D. Byfield; 2, Mr G. Stepsows; 3, Mr R. Jones. **D**: 1 & 3, Mr R. Jones; 2, Mrs B. Fry; 4, Mr D. Byfield. **Da**: 1, 2, 3 & 4, Mr F. Jacobs. **E**: 1, Mr P. Waller; 2 & 4, Mr R. Victory; 3, Mr B. Fry. **F**: 1, 3 & 4, Mr R. Smith; 2, Mr W. Woodward. **G**: 1 & 2, Mr R. Jones; 3, Mr S. Melbourne; 4, Mr D. Durrant. **H**: 1, Mr K. Wrightson; 2 & 4, Mr R. Jones; 3, Mr D. Durrant. **J**: 1, Mrs B. Fry; 2, Mr D. Byfield; 3, Mr D. Durrant; 4, Mr K. Wrighton. **K**: 1 & 3, Mr R. Jones; 2, Mrs B. Fry; 4, Mr P. Waller. **M**: 1, Mrs S. Hedges; 2, 3 & 4, Mr D. Byfield. **NB-M**: 1, 2 & 3, Mr K. Wrightson; 4, Mr D. Canham. **NO-T**: 1, Mr R. Davis; 2, Mr F. Jacobs; 3, Mr D. Canham; 4, Mr K. Wrightson.

P: 1, Mr F. Jacobs; 2, Mr R. Victory; 3, Mr R. Davis; 4, Mr C. Ball. **R**: 1 & 2, Mr D. Byfield; 3, Mr R. Jones; 4, Mr J. Risk. **S**: 1, Mr W. Baker; 2 & 3, Mr F. Jacobs. **T**: 1, 2 & 4, Mr A. Sharp; 3, Mr D. Canham.

U: 1, Mrs S. Hedges; 2 & 4, Mr R. Victory; 3, Mr T. Bullock. **V**: 1 & 3, Mr T. Bullock; 2, Mrs B. Fry. **W**: 1, Mrs S. Hedges; 2, Mrs B. Fry; 3, Mr B. Fry. **XB-M**: 1 & 2 Mr C. Olley; 3, Mr D. Canham; 4, Mr D. Byfield. **XO-T**: 1, Mr W. Woodward; 2, Mr R. Smith; 3, Mr R. Victory; 4, Mr R. Jones. **Z**: 1 & 2, Mr W. Woodward; 3, Mr D. Byfield; 4, Mr D. Durrant. Junior tropical: 1, D. Sharp; 2, S. Cooper; 3, C. Sharp; 4, M. Cooper. Junior coldwater: 1, A. Durrant; 2, B. Canham; 3, P. Canham.

BKKS Stage Second Koi-only Show

THE **BRITISH KOI KEEPERS' SOCIETY P.R.O.**, Miss V. Frost, sends us news of the Society's activities recently: "Having been unable to attend the first-ever Koi Show in this country organised by the BKKS Northern Section at the home of Mr & Mrs P. Waddington in Bury, Lancs, I was determined to be at the next one at the home of Mr & Mrs J. Copeland in Poynton, Cheshire, where Mr Copeland had just finished laying out extensive water gardens. Those of us who had been on the BKKS Japan trip in the Spring had heard little else throughout the tour! We were anxious to see if Jack had been exaggerating; but he had not! He now has enough water surface area to keep most of the koi in Britain, apart from the natural lake he already has at the bottom of the garden.

As a fancy pool fish, koi must, of course, be judged from above. Northern Section members Mr D. Hollon and Mr R. Seal racked their brains for a long time before coming up with the idea for the containers used. These are made from plastic garden fencing 10-12 in. high and long enough to make 3 ft, 3 ft 6 in. and 4 ft diameter containers. Each end of the fencing is brought together to form a circle and joined together with plastic-covered wire. This particular type of fencing has long spikes on the bottom edge for pushing into the ground and this makes a firm support for the blue polythene sheeting which is used for the liner. There is no limit to the size these containers can be made and the equipment may be used again and again.

There were 42 entries for the various classes and groups. All the fish looked in very good condition after the marvellous summer they had just eaten their way through. The principle idea behind these shows is to foster good fish-keeping and 50 per cent of the points were awarded for health alone, with 30 points for colour and 20 points for pattern. Mr G. Lupton, Mr B. Rowlinson and Mr T. Firman had the difficult task of judging while the rest of us enjoyed the hospitality and delicious food provided by Mr & Mrs Copeland.

Main prize winners were as follows: Class I (up to 7 in.): Shusui (Mr R. Hodgson); class II (7 in. to 10 in.): Kohaku (Mr A. Bailey); class III (10 in. to 14 in.): Gin Rin (Mr A. Danks); class IV (14 in. to 18 in.): Kohaku (Mr P. Searle); class V (18 in. to 22 in.): Kohaku (Mrs J. Copeland). Best in Classes (Variety): Kohaku (Mr P. Searle); Showa Sanke (Mr A. Bailey); Taisho Sanke (Mr P. Searle); Utsuri (Mr A. Danks); Bekko (Mr R. Seal); Asagi/Shusui (Mr R. Hodgson); Ogon (Mr J. Copeland); Hariwake (Mr G. Woodward); Kawari Mono (Mr A. Danks); Hikari Mono (Mr G. Woodward); Gin Rin (Mr A. Danks).

Best in Show, 1, Kohaku (Mr P. Searle) — a very nice kohaku (red-and-white) fish bought at Miyakoya in Japan during the Spring trip; 2, Kohaku (Mrs J. Copeland); 3, Ogon (Mr J. Copeland); 4, Gin Rin (Mr A. Danks); 5, Bekko (Mr R. Seal)."

"On the last day of The

BOSTON AS would be pleased to hear from anyone who can offer the loan or hire of film shows or slide shows. Information please to the secretary, Mr K. Prendergast, 48 Robin Hood's Walk, Boston, Lincs. PE21 9ES.

Aquarium Show over 110 members of the BKKS assembled in the 'Fruit & Veg' Room in the RHS New Hall only to find, once again, that their numbers were considerably in excess of the chairs available. Next year we really will have a bigger room — although it certainly promotes closer friendship amongst members! Mr G. Lupton, our new chairman of four months, introduced the Devis brothers, Eric and Vic, of British-Bred Koi, who had overcome many personal problems to be at the meeting with their excellent selection of koi slides and entertaining talk on their personal pond constructions over the years. Time did not permit the promised general discussion to take place but it is hoped that Eric and Vic can be persuaded to give us the benefit of their experiences again in the not-too-distant future."

THE chairman of **MID-SUSSEX AS**, Mr R. Johnson, welcomed members of Brighton & Southern AS, Crawley & Horsham AS, Hastings, Redhill & Reigate, Southern Independent and Tonbridge AS to the November meeting which was, as usual, the largest meeting of the year and the occasion of the final fish show. Mrs S. Corbin arranged and organised the social evening. The table show was judged by Mr J. Stillwell, vice-president of the Society, who awarded the following cards:

Characins: 1 & 4, Mr B. Sayers (Brighton); 2, Mr Kirkchaird (Tonbridge); 3, Mr S. Duffel (Crawley & Horsham). Labyrinths: 1 & 2, Mr M. Sparshott (Mid-Sussex); 3 & 4, Mr T. Ramshaw (Brighton). Corydoras: 1, Mr K. Farnell (Tonbridge); 2, Mr K. Groves (Crawley & Horsham); 3, Mr D. Anscombe (Mid-Sussex); 4, Mr T. Ramshaw. Rasboras: 1, Mr T. Ramshaw; 2 & 3, Mr B. Slade (Mid-Sussex); 4, Mr S. Feast (Tonbridge). Danios and minnows: 1 & 2, Mr I. Bellingham (Tonbridge); 3, Mr P. Berry (Mid-Sussex); 4, Mr P. Owles (Crawley & Horsham). aos Livebearers: 1 & 2, Mr C. Thorpe (Reigate & Redhill); 3, Mr D. Purchard (Tonbridge); 4, Mr T. Ramshaw.

Total marks were: 1, Tonbridge (17); 2, Mid-Sussex (16); 3, Brighton (14); 4, Reigate & Redhill (7); 5, Crawley & Horsham (6).

20 MEMBERS of **AMERSHAM & DAS** benched 62 fish when the Society held their annual Members' Open Show. Prizes were presented by Mrs J. Barnfield, secretary of the Amersham Community Centre as follows:

Barbs: 1, Mr E. F. Gates; 2, Mr O. Mawers. Characins: 1 & 2, Mr A. Rollason. Cichlids: 1, Mr A. Rollason; 2, Mr R. Harper; 3, Mr P. Daniels. Labyrinths: 1, Mrs M. Daniels; 2, Mr J. Goulding. Tropical catfish: 1, Miss L. Tizzard; 2, Mr R. Steptoe; 3, Mr P. Daniels. Danios, minnows, rasboras: 1, Mr A. Rollason; 2, Master P. Guze; 3, Master T. Hearn. Loaches & botia: 1, Master P. Guze; 2, Mr K. North. Tropical egglayer: 1, Mr K. North. Guppys: 1, Master S. Descombre; 2, Mr A. Rollason; 3, Master P. Guze. av Livebearer: 1, Master T. Hearn; 2, Master S. Descombre. av Breeders class (4 fish): 1, Mr S. Thompson; 2, Mr R. Harper. av Coldwater fish: 1, Master P. Daniels; 2, Mrs M. Daniels. Furnish show jar competitions: 1 & 2, Mr S. Thompson.

Dates for Your Diary

22nd February. **RETFORD & DAS** 2nd Open Show. Butter Market, Town Hall, Market Square, Retford, Notts. Schedules: Mr B. D. Chester, 7 Rose Lea, Ordsall, Retford, Notts., DN22 7SB.

20th March. **RIVERSIDE AS** Open Show. Details to follow.

4th April. **NELSON AS** Open Show. The Civic Centre, Stanley Street, Nelson, Lancs. Details: Mr J. Stokes, 3 Beckenham Court, Burnley.

10th April. **YATE & DAS** 10th Open Show. King Edmunds School, Stanshawes, Yate, nr. Bristol. Schedules (1st March): Mr C. Stickland, 20 Burgage Close, Chipping Sodbury, nr. Bristol.

10th April. **CATFISH ASSOCIATION OF G.B.** Open Show. St. Saviours Church Hall, Cobbold Road, London, W.12. Schedules: Mr D. Lambourne, 7 Wheeler Court, Plough Road, London, SW11; 01 223 2630.

11th April. **COVENTRY P & AS** Open Show. Templars Junior School, Tile Hill Lane, Coventry. Schedules (large sae please): Mr T. Emms, 79 Edward Road, Coventry CV6 2QS.

25th April. **YEOVIL & DAS** Open Show. School Hall, Martock, nr Yeovil, Somerset. Details: Mr P. C. New, 73 Lyde Road, Yeovil, Somerset: Yeovil 24225.

8th May. **SOUTHEND, LEIGH & DAS** Open Show. St Clements Hall, Leigh-on-Sea, Essex. Club & Individual furnished, aquascapes, marines, tropical, coldwater and junior classes. Details: Mr D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea, Essex: 0702 610576.

22nd May. **MERTHYR AS** Open Show. Details: Mr D. Burgess, 4 Holly Way, Gurnos Estate, Merthyr Tydfil.

3rd July. **CARDIFF AS** Open Show. St Margaret's Church Hall, Roath, Cardiff. Details to follow.

15th August. **STROUD AS** Open Show. Subscription Rooms, Stroud. Schedules: Mr J. Cole, 13 The Hill, Randwick, Stroud, Glos. (Stroud 4504).

28th August. **THIRD WELSH NATIONAL OPEN SHOW** and Exhibition of Tropical, Marine and Coldwater fish. Sophia Garden's Pavilion, Cardiff. Details: Mr C. Turner, 146 Arran Street, Roath, Cardiff: Cardiff 498982.

12th September. **HARLOW AS** Open Show.

29th-31st October. **THE AQUARIUM SHOW '76** at the Royal Horticultural Society's Old Hall, Vincent Square, London, S.W.1. Sponsored by PFM. Presented by the **Federation of British Aquatic Societies**. Aquarium society fishkeeping exhibits invited. Details from the organiser, PFM, 554 Garratt Lane, London SW17 0NY: phone 01-947 2805.

In Brief...

. . . MEMBERS of **COVENTRY POOL & AS** are jubilant at having won the M.A.L. League competition this year. Final results were: Coventry, 98 points; Bedworth 50; Hinckley 67; Leamington 75; Loughborough 36; Goodyears End 15; Rugby 19.

. . . AT a recent monthly meeting of **NEW FOREST AS** (FBAS-affiliated) a general discussion was held on many varied and interesting subjects, such as cures for excess of snails in the tank or the expressed belief of many members that good quality swordtails had disappeared from pet shops in the South lately. Table show for barbs winner: Mr R. Travers (2 & 3, Mr M. Aust). Membership details from Mr R. Travers, 6 Auckland Avenue, Brockenhurst, Hants, SW4 7RS.

. . . THE first of the **LINCOLN & DAS** November meetings was held for beginners with a film show on suitable fish for the aquatic novice, and there was

a very good attendance. The table show for tetras and barbs was won by Mrs Evans (2, Mr Calam; 3, Master Pearce; 4, Master Spittlehouse).

. . . **TAUNTON & DAS.** meeting at the Railway Club Hall, much enjoyed the talk by Mr Langdon of Yeovil on keeping and breeding coldwater fish. Table show cups (7 classes, judge Mr New) were presented to Mr D. Curry (best fish in show), C. Pincombe (best junior entry) and Mr R. Hagley (best pair egglayers). Members have also been busy re-establishing tanks in the outpatients department of the local hospital.

. . . THE newly-formed **YORKSHIRE KOI SOCIETY** meets monthly at venues throughout Yorkshire and the north east and issues a monthly newsletter called "Koi". New members receive the newsletter monthly, a set of rules, the year's programme and a copy of a book on koi-keeping. Anyone is welcome to join, expert or novice. Full details from secretary, Mr J. W. Mawson, 78 Gledhow Wood Ave., Roundhay, Leeds.

. . . MRS. R. HOUGHTON was awarded first, second and third places in the Ladies Cup competition at the **BRIGHTON & SOUTHERN AS** November meeting. The other classes in the table show were for breeders egglayers and breeders livebearers and judge Mr N. Davies (FBAS) awarded these to Mr B. Sayers and Mr R. Cannon respectively.

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TACHBROOK TROPICALS LTD

244 VAUXHALL BRIDGE ROAD LONDON S.W.1 Telephone 01-834 5179

The Aquatic Specialist Store With its Own Fish and Aquatic Plant Nurseries

STOCKISTS of Waterlife Research Ltd.
REMEDIES, EQUIPMENT, SALTWATER FISH & INVERTEBRATES Have come to Victoria

SEA SALT

Synthetica 5 gals. 86p
Synthetica 20 gals. £2.59
Synthetica 100 gals. £10.80
Natura 10 gals. £1.73

WATER MANAGEMENT PRODUCTS

Seabuff 59p
Seatrace 83p
Seagreen 83p
Taxoflora 65p
Haloex 70p
Humaquat 65p
Algizin 'P' £1.08
Seacoal — standard pack 43p
Seacoal — medium pack 81p
Seacoal — super pack £1.35
Protocoal — medium pack 59p
Protocoal — super pack £1.08
Seamature 65p

MEDICATIONS

Cuprazin 1 oz. 70p
Cuprazin 5 oz. £2.43
Sterazin 1 oz. 70p
Sterazin 5 oz. £2.43
Sterazin 'P' £1.78
Myxazin 70p
Protozin 65p
Seavita 65p

WATER TEST KITS

Nitrate Kits £1.96
pH Kits £1.96
Seadrometer 98p
Plus — Ultra Hydrometer £1.84

GENERAL

Seamist 1½" 13p
Seamist 2" 16p
Seamist 3" 22p
Coral Sand — 5 lb. £1.08
Sea Shell — 5 lb. 75p

We can offer any of our clients (A) (B) and (C)

(A) Marine Livestock of the same high quality as our freshwater livestock.
(B) Superlative Marine Salts, Medications, Test Kits, Additives, etc.
(C) The sort of expert technical assistance we've always been noted for.

We stock a variety of accessories to suit all requirements.

Send for catalogue (SAE please) or visit us personally.
Hours of business 9 a.m. to 6 p.m. Monday to Saturday.

NEW TROPIC-MARIN

Synthetic Marine Salt with Guarantee

NEW TROPIC-MARIN is an entirely new development, produced under constant scientific control. Its scientific formula is based on the most modern and accurate analyses of tropical oceans. Due to the use of solid solutions (mixed crystals), there is no precipitation when dissolved. It is practically impossible to distinguish marine water made from **NEW TROPIC-MARIN** from real sea-water. The most delicate marine fish, invertebrates and marine plants will thrive in it as they would in their natural surroundings.

Guarantee
We guarantee that this excellent marine salt contains all 70 of the following trace elements and is made of chemically pure salts.

Aluminium	Al	Europium	Eu	Mercury	Hg	Selenium	Se
Antimony	Sb	Fluorine	F	Molybdenum	Mo	Silicon	Si
Arsenic	As	Gadolinium	Gd	Neodymium	Nd	Silver	Ag
Barium	Ba	Gallium	Ga	Nickel	Ni	Strontium	Sr
Beryllium	Be	Germanium	Ge	Niobium	Nb	Tantalum	Ta
Bismuth	Bi	Gold	Au	Nitrogen	N	Tellurium	Tc
Boron	B	Hafnium	Hf	Osmium	Os	Terbium	Tb
Bromine	Br	Holmium	Ho	Palladium	Pd	Thallium	Tl
Cadmium	Cd	Indium	In	Phosphorus	P	Thorium	Th
Carbon	C	Iodine	I	Platinum	Pt	Thulium	Tm
Cerium	Ce	Iridium	Ir	Praseodymium	Pr	Tin	Sn
Cesium	Cs	Iron	Fe	Rhenium	Re	Titanium	Ti
Chromium	Cr	Lanthanum	La	Rhodium	Rh	Tungsten	W
Cobalt	Co	Lead	Pb	Rubidium	Rb	Uranium	U
Copper	Cu	Lithium	Li	Ruthenium	Ru	Vanadium	V
Drysprosium	Dy	Lutetium	Lu	Samarium	Sm	Ytterbium	Yb
Erbium	Er	Manganese	Mn	Scandium	Sc	Yttrium	Y
						Zinc	Zn
						Zirconium	Zr

Directions for use:
Dissolve salt in the aquarium or a plastic container until the hydrometer shows the specific gravity to be 1.023 or 1.025 (380gr. for 10 l.). It is suggested to aerate the fresh salt water for several hours before putting in animals. Unlike some less sophisticated salts the entire contents of this bag should be mixed at one time and it should not be attempted to divide the bag.

Made in Western Germany

Retail Prices: 20 gals. (91 litres) £2.70 inc. VAT.
10 gals. (45 litres) £1.51 inc. VAT.
5 gals. (22.5 litres) 97p inc. VAT.

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