

MARCH 1973

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Monthly 20p

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March 1973

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Comments and Quotes

- A source of detailed information about an important group of 'new imports'

Nature's Laboratories

THERE can be little doubt about which groups of aquarium fishes make up the bulk of today's 'first-time imports' and 'new species': they are the cichlids and catfishes. These new representatives of both groups are more likely to be kept by specialist fishkeepers than by those whose aquarium interests are more general, but the specialists are assuredly a growing band whose demand has, in fact, in some instances actually stimulated the supply.

Everyone knows by now that the great lakes of Africa are proving a rich source of most interesting aquarium subjects not before readily available to aquarists. The cichlids, in particular, from these lakes have really caught the imagination of many fishkeepers. These enthusiasts must count themselves doubly fortunate in also having available a really first-class guide-book to their cichlids prepared by ichthyologists whose observations were made over long periods spent 'on the site'. This book, THE CICHLID FISHERS OF THE GREAT LAKES OF AFRICA by Geoffrey Fryer and T. D. Hes (Oliver and Boyd), published last year, is in fact bound to make interesting reading for anyone with enthusiasm for living fishes, whatever the types. It will undoubtedly cause aquarists with interests in other groups to bemoan the fact that similarly satisfying detailed published information is not available for their own specialities.

Unless the Dark Continent's geography has long been an absorbing study for the reader the book will give him some eye-opening facts about these African waters as well as about their inhabitants. The Lakes

Victoria, Tanganyika and Malawi (three of about 16 major African lakes) between them contain more known fish species than any other world lake; most of these fishes are cichlids, and of these Lake Malawi has the most. It may also be a surprise to learn that there are at least 500 known cichlid species in these three lakes alone.

The interest of these lakes for the aquarist is clearly apparent, but what makes them interesting to the biologist? For the student of evolution it is because, to quote from the book's Preface, 'the great lakes of Africa are laboratories in which nature is carrying out experiments on a grand scale, and in these experiments cichlid fishes constitute the most important material'.

In their text the authors deal not only with these natural experiments but also with structure and habits of African cichlids, including their breeding, the 'language' of cichlids, their predators and parasites, their economic importance and much more. Lucky cichlid keepers to have this thoroughly scholarly work that is an example of what such a text should be, which in spite of the technicalities of some of the topics it covers is always perfectly readable.

Wrong Picture

WE regret that the photograph published with the article 'A Catfish for the Specialist' by J. Elias in last month's issue was not of the fish described in the article (*Pimelodus clausii*) but was the smaller species closely resembling it, namely *Pimelodella pictus*. We are grateful to Mr D. Lambourne for drawing our attention to this error.



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

The Correct Scientific Name for Giant 'Hygro'

IN your January issue you generously printed two articles on the 'giant hygro'. Dr K. Rataj called the plant *Nomaphila stricta* while Mr F. Campbell is a little worried about its name and gives *Hygrophila corymbosa* and *Hygrophila stricta* as additional names. I would like to try and explain why this confusion exists and what the correct name really is.

Plants were first given binominal Latin names around the middle of the eighteenth century. At that time relatively few plants had been collected from the tropics. When very little material is at hand there is a tendency to sort it into relatively few categories. The 'giant hygro' was first named in 1791 by the Danish botanist M. H. Vahl; he called it *Justicia stricta*. As more material from the tropics was collected and studied it was realised that *Justicia* was not a 'natural' genus and it was split up into numerous smaller genera, such as *Asteracantha*, *Hygrophila*, *Nomaphila*, *Synsena* etc. In 1845 a botanist called Nees took our 'giant hygro' out of the genus *Justicia* and placed it in the genus *Nomaphila* and called it *Nomaphila stricta*.

Today we have larger collections of this group and when one compares the plants critically one finds numerous species that bridge the gaps between genera. Dr H. Heine in Paris and other botanists have studied this group and are of the opinion that the genera *Asteracantha*, *Hygrophila*, *Nomaphila* and *Synsena* are not separable and they must be 'lumped' together. This work of sorting out the plants is the botanical side of the problem. To find the correct name is more or less a legal problem. The naming of plants is done by following the International Code of Botanical Nomenclature. The code contains rules governing the choice of names for plants and, among other things, it is remarkable in being truly international; botanists from all countries of the world follow the same rules. I will spare you the details but, in general, the rules of nomenclature are based on priorities, that is, the earliest legally correct name must be used.

When it is decided that *Asteracantha*, *Hygrophila*, *Nomaphila* and *Synsena* are to be lumped together the correct generic name is *Hygrophila*.

Unfortunately, while our 'giant hygro' was called *Nomaphila stricta* another botanist (Lindau) described a new species of *Hygrophila* in 1894 and named it *Hygrophila stricta*. When *Nomaphila* and *Hygrophila* are combined the specific name 'stricta' is already in use in *Hygrophila* for a plant that is not our 'giant hygro'. Therefore, the next oldest name must be found and this is *Hygrophila corymbosa*. If you really think that the genera *Hygrophila* and *Nomaphila* are distinct and separate then you are entitled to call the 'giant hygro' *Nomaphila stricta*. However, if you agree that they are not separate then you must call the 'giant hygro' *Hygrophila corymbosa*. Using almost the same argument *Synsena triflorum* ('water wisteria') must be called *Hygrophila difformis*.

There are more than 100 species in the enlarged *Hygrophila* and many of them are probably suitable for aquarium cultivation. If you persist in maintaining *Synsena*, *Nomaphila* and *Hygrophila* as separate genera then you are probably going to heap more nomenclatural confusion on the next generation of aquarists because intermediate species are also likely to become available.

PROFESSOR C. D. K. COOK
Director, Botanical Garden and
Institute for Systematic Botany,
University of Zürich

Satisfied Hobbyist

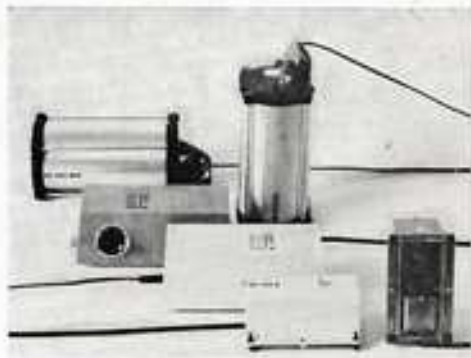
THREE years ago I decided to keep tropical fish. I started with two tanks 24 in. by 12 in. by 12 in. and my first fishes were guppy, sucking loach, red-fin shark. I bought books and ordered the aquatic magazines. I read the experts' advice on starting and keeping an aquarium and all the comments etc. in the monthly magazines. Some 6 months later I parted with my small tanks in favour of two more—36 in. by 15 in. by 15 in., 42 in. by 15 in. by 15 in. I then purchased more fishes and made up two good community tanks. I mixed harbs with swordtails, black mollies,

Continued on page 541

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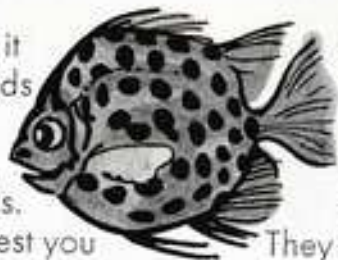
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LETTERS

Continued from page 334

platys, zebra danio, harlequin, neon tetra, angel fish, black widows, penguins, mountain minnow, lace, pearl, three-spot gouramis, catfish, sucking loach and more red-fin sharks.

Now the reason for this letter is—I read all the comments and indeed moans of people who stick to the rules—they say they cannot breed, the water is too soft or too hard, plant life is practically non-existent. Coventry is a hard-water area. I top my tanks by filling a bucket three-quarters full with cold tap water, bring it up to temperature with boiling water, then straight into the tanks. I clean my tanks once a month, the filter every 2 weeks. The plant life I pull out about every 3 weeks—some I give away, the rest I throw away. Plants grow so thickly that space for my fishes becomes limited. The plants are hornwort, ambulia, hygrophila, Amazon sword, hair grass and water lettuce. I have bred guppies, swordtails, black mollies, merry widows and blue scaras. I am no expert and have a great deal more to learn about these wonderful creatures. I have tried many gadgets and indeed thought of some myself to make the tanks more attractive, I feed with dried food, daphnia about every 2 months; the water is clear, the temperature 78°F and I have lost four fish in 13 months. So I have read the experts and used some of their knowledge, but I have mainly gone my own way and I believe by doing this I have had a great deal of enjoyment, with good, healthy, clean tanks. I am therefore wondering

whether this is pure luck, or have I hit an even balance?

Coventry, Warks.

E. ADAMS

Living Filters

REGARDING Mr J. Burtles' letter (1973, January) about keeping mussels in tanks as 'living filters', I would like to point out that the glochidia larvae of swan mussels are parasitic on the gills of minnows in coldwater rivers and so presumably they would also parasitise tropical fish. As they greatly damage their hosts, it would seem that this is the reason why they are never seen in dealers' tanks. Also the larvae live for some time inside the parent mussel before being released into the water and so it is unadvisable even to put a single mussel in fish tanks.

Osndle, Peterborough

JAMES BYWATER

A VERY good reason for the absence of swan mussels from dealers' tanks, to which your correspondent Mr J. Burtles refers, is that in aquaria (and in my experience in small ponds, too) these molluscs do not live very long. They are wonderful 'filters' but this ingestion of particles is their way of feeding, and without a far better supply of suspended particles than the average tank or pond can provide the mussels die of starvation. I don't think much purpose would be served by keeping a tank murky with suspended food just to keep the 'filter' alive! The much smaller orb-shell and pea-shell 'cockles' (*Sphaerium* and *Pisidium*) or even the stationary mussel *Dreissensia* might be much better candidates for Mr Burtles' living filter system but there may be difficulty over sensitivity to the higher water temperatures of tropical tanks.

After all, *Dreissensia* is supposed to have come to this country on timber reaching us from the USSR!

Woking, Surrey

F. TURNER

Coming Events

THE BRITISH AQUARIST STUDY SOCIETY (BASS) is holding its first meeting of the year on 31st March at the Meeting Room of the Zoological Society, Regents Park, London, NW1. Dr David Scott of St Andrews University will be talking on the Bony Tongued Fishes of Asia and America. The lecture will be illustrated with slides and films made by the speaker on

his visits to these parts of the world. BASS is extending a special invitation to non-members for this meeting. Tickets are available from Mr F. Keon, Highcliff, Old Hill, Woking, Surrey, price £1.00 to include refreshments.

THE Open Show organised by the Borough Council of Hackney in association with the Essex, North and East London Aquarists Association that is being held in the King's Hall, Lower Clapton Road, London, E5 on Saturday and Sunday 17th and 18th March is to comprise an

inter-club furnished aquaria class, an individual aquascaping class, an individual miniature furnished aquaria class, 23 tropical fish classes, 6 cold-water fish classes, a plants class and trade exhibits. Since the Fur, Feather and Aquaria Show held in the hall last November, improvements have been made to the heating system. Entries close on 10th March—tickets are available from the Bath & Civic Recreation Department, London Borough of Hackney, 29 Lower Clapton Road, London, E5 6NU. Show secretary is Mr Ron Kerridge of Harlow.

What Fish Geneticists are Up To

ADVANCES in the field of genetics of fishes are hardly likely to make the 9 o'clock News, and to discover what is going on entails keeping a close eye on abstracts of numerous scientific journals. Even then the seeker of information is likely to feel thwarted if he finds that the original of the report that attracts his interest is in Russian or Japanese.

Geneticists concerning themselves with studies of fishes are more often than not involved with 'economic fishes', where their findings may show the way to the production of bigger, tastier or fewer-boned carp, for example, for man's consumption. Nevertheless, some of this work involves fundamental aspects of genetics that are of more general application and there are, also, some geneticists working with fish species that are found in aquarists' tanks.

A Conference on Genetics, Selection and Hybridisation of Fish was held in Leningrad in 1967 and translations from Russian of 30 of the papers presented at the Conference have just been published as a book (GENETICS, SELECTION AND HYBRIDISATION OF FISH, edited by B. I. Chertias; I.P.S.T., Jerusalem, 1972, £9.85). Despite the long delay over publication of the papers in English their availability now is nonetheless welcome.

Apart from the carp (*Cyprinus carpio*), the fishes of interest to aquarists that have been most studied are the goldfish (*Carassius auratus*), the guppy (*Poecilia reticulata*), platys and swordtails (*Xiphophorus maculatus*, *X. variatus*, *X. helleri*), the fighting fish (*Betta splendens*), the paradise fish (*Macropodus opercularis*), the black-barred limia (*Limia nigrofasciata*) and the Japanese medaka (*Oryzias latipes*).

Inherited characteristics that have been studied are placed in four groups by Dr V. S. Kirpichnikov of the Research Institute of Lake and River Fisheries of Leningrad: 1, major structural features such as inherited variations in shape of finnage, scaling or coloration; 2, quantitative features such as variation in body weight, number of bones or fin rays; 3, physiological characteristics such as blood protein and blood 'groups'; 4, deviations from what is considered normal—deformities that can be intensified by in-breeding. Of these four groups the first and perhaps the fourth are the types of studies that involve characteristics in which aquarists are particularly interested.

For tropical fishes the main lines of research have been concerned with the way that various characters of the above-mentioned types are

inherited, the determination of sex, analysis of inheritance in varieties of a species in natural populations ('genetic polymorphism') and the genetics of malignant tumours in fish cross-breeds.

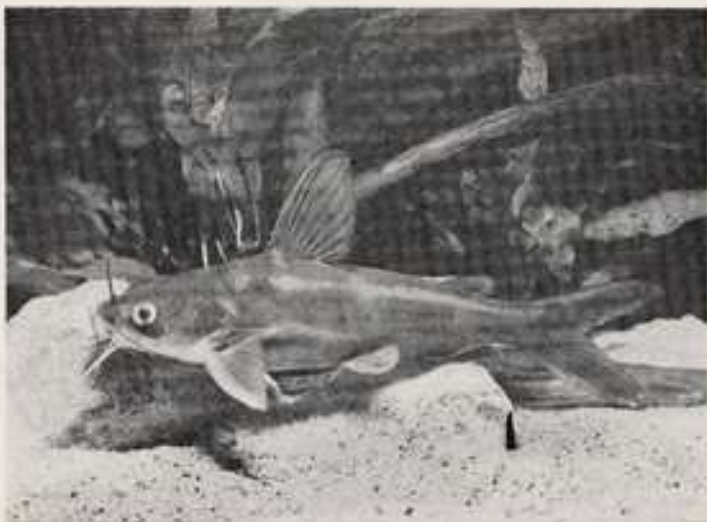
Genetic polymorphism is well known to occur in guppies and platys, showing up in their colour variations, and since colour genes in many of the livebearers are in the 'sex chromosomes' that determine sex, these two lines of investigation come together with such fishes.

V. A. Geodakyan and V. I. Kosobutski (Institute of Genetics of the Academy of Sciences of the USSR) have conducted experiments with guppies on the control of the sex ratio (relative numbers of males to females). Their findings appear to indicate that when males exceed females (10 : 1) in a breeding group the number of females produced increases. Maximum production of females under these circumstances was found by these workers to occur with the first progeny; subsequent hatches of young showed a smaller bias of females over males. Likewise, although less spectacular, the result when ten females were kept with one male was that the number of males in the progeny increased. Also there was reported an overall increase in fertility of females kept with males in excess. The means by which these changes occur is unexplained, although the advantage of such an arrangement for the species can be seen.

Observations on carp have indicated that the old fish-farmer's advice not to use first-year fish or adults over 10 years old in spawning ponds is sound breeding practice, say the geneticists. Choice of breeders for goldfish selective breeding programmes might usefully be based on this observation. In a more academic vein, a discussion by R. M. Viktorovski of the possible part played by polyploidy (the development of an organism having more than the recognised species number of chromosomes per cell) in the evolution of fishes includes a note on the Cyprinidae. For species in this family other than the genera *Cyprinus* and *Carassius* the number of chromosomes is 52. In carp (*Cyprinus carpio*) it is 104 and in both Crucian carp (*Carassius carassius*) and the goldfish (*Carassius auratus*) it is 94. Has the goldfish evolved from an earlier form from which it arose by polyploidy?

At the Russian Conference decisions were taken to increase the facilities for the study of fish genetics so that the call for increased efficiency of pond culture can be met, and practical recommendations included plans for more experimental ponds and aquaria suitable for genetic research.

Asiatic Catfish Collected from a Russian River



Pseudobagrus fulvidraco

NOT long ago our permanent exhibition of fish in Brno was enriched by an acquisition donated by Herr Dr Bohumil Král of the Czechoslovak Academy of Sciences. From an expedition to the River Amur (USSR) he brought back two species of catfish, one of which was identified as *Pseudobagrus fulvidraco*.

The catfish of the Bagridae family inhabit the soft waters of Asia and Africa. About 15 genera are included in the family and two of these live in the river basin of the Amur—*Pseudobagrus* and *Leiocassis*. Representatives of *Pseudobagrus* are distributed in India, China, the basin of the Amur, Korea and Japan, and about 10 species are known. *Pseudobagrus fulvidraco* is the Asiatic catfish distributed in China, Korea and the Amur basin. The fish was first described in 1846 by Richardson under the generic name '*Pimeolus*', but the *Pseudobagrus* genus was first created in 1863 by Bleeker. Our catfish closely resembles the Japanese species, *Pseudobagrus nudiceps* (Sauvage, 1883); but also resembles *P. intermedius* (Nichols &

By
J. ELIAS & Dr. S. FRANK

Photographs by J. ELIAS

Pope, 1927) from the island Chaj-nan. Berg classifies the three species mentioned as closely related but distinct species.

In its natural waters *P. fulvidraco* grows to 14 in. (35 cm.) in length and, according to Nikolskij, the males are larger than the females. Eggs are laid in holes hollowed out of the bottom of the river bed near the bank and the male takes over the care of the brood. The fish has very fine and edible flesh.

The body is long and rounded, especially in the belly region. Across a dark, but not black, background hue, two parallel narrow grey stripes run, beginning under the dorsal and continuing to the deeply indented caudal fin. These stripes are criss-crossed by diagonal grey bars so that the

sides of the fish are marked in rectangles. The long head is flattened underneath and on top; four barbels appear on each of the upper and lower jaws. The dorsal fin is high, and the pectoral fins are broad with a tooth-shaped spike on the first hard fin-ray. The belly is white.

The fish when received were about 3 in. long (8 cm.), and they withstood the rigours of the long journey without the slightest ill-effects, remaining in extraordinarily good condition. The attention given in the few first days to new imports in an aquarium is always critical but our fish came to no harm. Within 2 weeks they were obviously feeling perfectly at home in their 22-gallon tank—the speed with which new fish settle down in a tank is in direct relation to the suitability of the conditions they are provided with. We were able to confirm that they can withstand a substantial range of water temperatures. At first they had scant respect for their surroundings but their dredging activities were only temporary; gradually these stopped completely as if the fish were somewhat ashamed of their former bad behaviour, until today they are kept in tank surroundings similar to those provided for other fishes.

In spite of their confined quarters the fish have grown quickly and at the time of writing they are 5½ in. (14 cm.) long. It seems that they will grow even larger. Like most catfish, *P. fulvidraco* begin their day's routine in the evening. Of course, the behavioural patterns established in Nature are frequently changed or effaced in captivity and so, if a feeding time is established during the daytime, catfish will come out for food then. Indeed, if we are late our fish seems to be disturbed and smuffle around the bottom of the tank watchfully as if worried that they might have missed their rations by sleeping. During the daytime they stay in the half-light behind large stones or lie on the leaves of *Echinodorus*—they always

choose places among the plants where they will be covered by the leaf surface. When they are resting they show not the slightest movement of the fins, as if they were quite lifeless. They dash for their food with all the powerful strength of their bodies but they don't seem to overfill their small bellies in the way that *Clarias angolensis* or *Pangasius sutchi* do. *P. fulvidraco* seems to prefer smaller, regular rations of food. The basic diet we provide for these fish consists of tubifex and bloodworms. This somewhat monotonous feeding does not seem to have any detrimental effect on their general body development and it certainly seems as though we have acquired some very undemanding charges.

Again, unlike *Pangasius sutchi*, they are not too easily frightened and when moving something in their tank it is not necessary to take such precautions not to startle them as with *P. sutchi*. With the latter species we have found that even a small disturbance will lead to a frantic panic to escape, and they can do themselves great harm in the process. *P. fulvidraco* can be held in the hand and they behave largely with indifference to things going on around them. Only when real danger threatens will they take to flight. Even then, it is speedy action that is taken and not panic flight.

A temperature of between 72 and 79°F (21-26°C) seems to suit them. Only young fish are suited to the aquarium as these are likely to be more adaptable and are a more suitable and reasonable size for their surroundings. We have aimed at providing a water hardness of 8-12 DH.

Breeding in captivity under the conditions of the usual home aquarium is rarely possible with fishes like these, which are of such a large size before becoming adult. So that although the catfish has been kept in aquaria for many years and has been classified as a seldom-bred species, it is not impossible that the future will bring us a surprise.



Head-on view of the specimen of *Pseudobogrus fulvidraco* in Brno Aquarium. The high dorsal fin and broadly spread pectoral fins are demonstrated well. Undersurface of the fish is white, contrasting sharply with the dark sides and back.

FISH HOUSE TECHNIQUE

Heating for the Fish House

By CLIFF HARRISON

WHETHER you plump for high-speed gas, the warmth of a living fire or half-price electricity, the problems of which to choose for the home are nothing in comparison with the decision about how to heat the fish house. Many hobbyists continue to rely on individual heaters and thermostats, such as they have used for years, but this is not necessarily the best or the most economical way. Fortunately the construction of an out-of-doors fish house from scratch means that everything can be planned and considered well in advance—the basic layout, staging, heating and tank sizes can all be designed afresh, and not be just an extension of an existing set-up.

Depending on the particular circumstances, almost any form of heating can be adapted to the fish house. Solid fuel, oil and gas are unlikely to be considered for anything smaller than a professional establishment as installation costs can be very high. If these systems are already in use in the home, however, it is possible to extend the existing hot-water circuit to include a radiator or heating-coil in the fish house. The more usual alternative heating forms to these are electricity and paraffin, both being relatively cheap to install but differing widely in running costs.

Electricity is normally used in one of two ways: for heating the tanks individually or alternatively for heating the air of the whole building. In either case there are disadvantages—with the former the large number of heaters and thermostats needed can become a major expense, quite apart from the inconvenience (and everpresent danger of electrocution) when having to disconnect them from the mains each time a tank is stripped down. The latter way—'space heating'—means that the air temperature has to be kept so high, around 80-82°F (27-28°C), as to make the fish house uncomfortable to work in for any length of time (space heating can, in any case, be done far more economically with paraffin). Further disadvantages of the use of individual heaters in aquaria are the possibility of the apparatus introducing infection to quarantined stock or causing burns or other damage to valuable specimens.

The system I have adopted overcomes these more serious problems, though it does admittedly

present a few others that I shall mention later. By using a paraffin greenhouse heater to maintain an air temperature around 72-74°F (22-23°C), and electricity to bring approximately one-half of the tanks to 80°F (27°C), I can work in comfort and yet give the fishes the temperature they require at an economical cost. People forget that many of the common livebearers (and some egg-layers, too), will live and breed quite happily in the lower seventies (°F), and the young are probably all the healthier for not being forced along at high temperatures. So these are kept in aquaria relying on the ambient heat only, whilst the individually heated tanks contain the more delicate and more demanding fishes.

The electrical heating system employs rows of insulated heating cable set in shallow open-top heating boxes about 12 in. wide; the heat output of the cable is 4 watts per foot, and six or eight rows per foot width of the box is sufficient. All-glass tanks are then placed on the boxes and, if the heating cable is connected through a thermostat on one tank, they will be kept at a particular temperature irrespective of tank length; with this system, tanks can be quickly cleaned out and rearranged according to the breeding requirements.

If the fish house is well insulated, surprising little adjustment of the output of the paraffin heater will be required—perhaps twice a week in the most changeable of weather. And for more than half the year in my fish house it is not needed at all, as the electric cable, supplemented by heat built up during the day, is able to maintain the air temperature during the occasional chilly summer or autumn night. In case the paraffin heater does fail for any reason, I have an 'emergency' system, comprising a 3-foot tubular heater and thermostat, which will cut-in if the air temperature ever falls below 68°F (20°C).

Now to the disadvantages of paraffin heating. First, paraffin heaters do have to be filled regularly and the wicks trimmed on occasions. You will also find that they produce some odorous fumes (my wife can always tell if I have spent an evening in the fish house), though rumour has it that the blue-flame types are better in this respect than the yellow-flame one I use. These fumes sometimes

produce a slight film on the aquarium water surface and on the glass, but the former disappears with the gentlest of aeration and the latter with the use of a damp paper tissue. I have never found these fumes harmful, having raised Siamese fighters and dwarf gouramis myself, and I do know that my friend, Dave Ellis, FBAS judge and lecturer, has had success with *Corydoras* and *Hoplosternum* catfish with paraffin heating in use: all four are species one might regard as being particularly susceptible to contaminated air in the early stages of development.

By now, you will have realised that the form of heating chosen is very much a matter of personal opinion: however, I hope these notes have done something to dispel the myth that paraffin heaters will poison all your fishes. Of course, if paraffin-tainted hands are dipped into tanks, or if the wick of the heater is carelessly turned up excessively high, so that oily smoke is produced, trouble can be expected. If common sense precautions are observed, there is no reason why we should not all make use of this particularly inexpensive method of fish house heating.

COLDWATER SCENE



When is the Best Time to Purchase Stock?

asks ARPEE

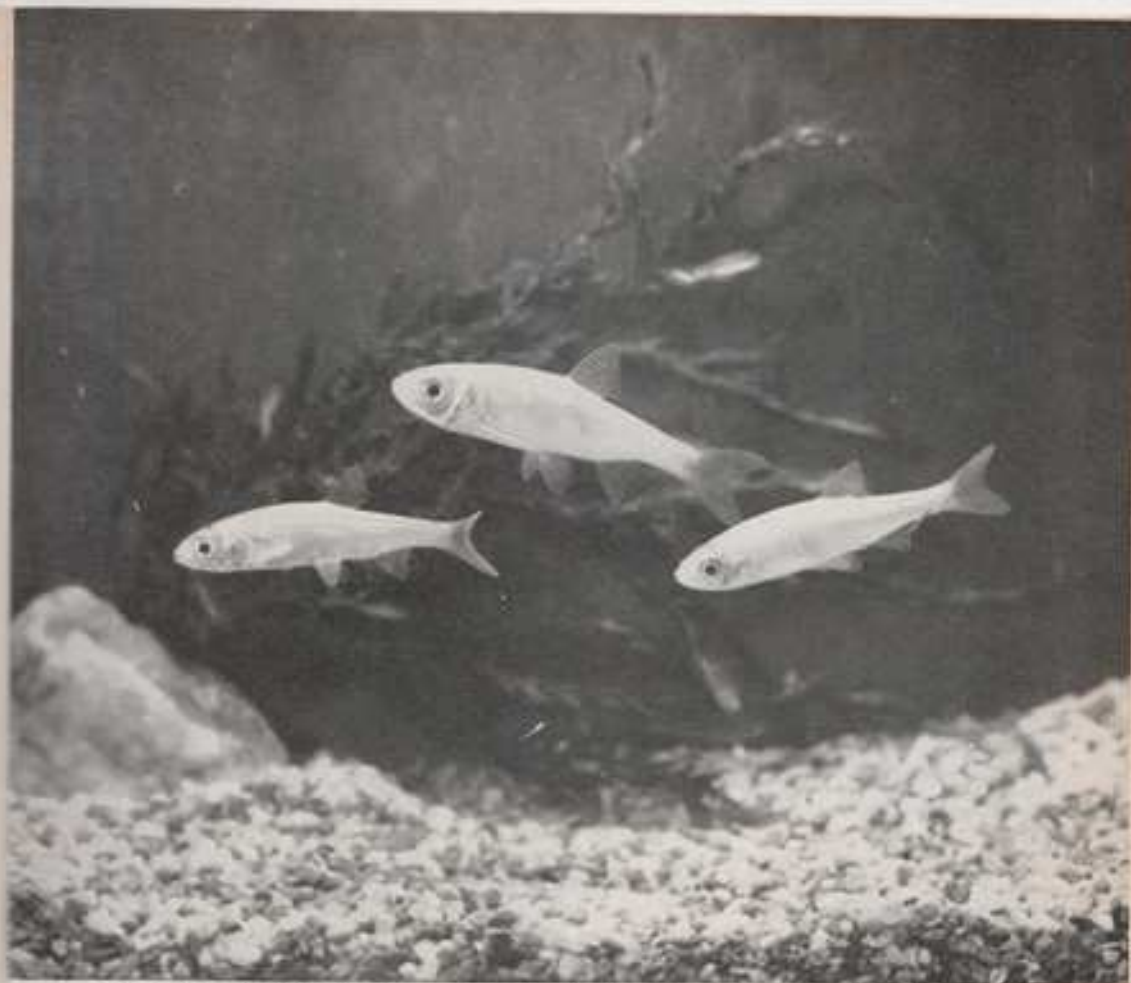
NOT so long before last Christmas I overheard a customer at a local shop asking for some small golden orfe, and he was regretfully told that none would be in stock until the spring. It is more or less taken for granted that few coldwater fishes change hands during the autumn/winter period, presumably because overwintering can be a hazardous business when a fish is exposed to strange water at a time when its resistance is taken to be at its lowest ebb. I wonder just how true this is.

I am inclined to believe that in very many cases precisely the opposite really applies, and that rather better results will be obtained from fishes bought late in the season than from those one falls for on first sighting them in April or May. I refer, of course, to imported fishes, and I believe these constitute the bulk of the market: quite different considerations would apply to home-bred specimens. Season after season I have been appalled at the wastage rate of imported coldwater fishes, and this may arise from their failure to acclimatise to our worsening summers or to a basically lower stamina. In many cases the specimens are pathetically undernourished from the outset—especially in the case of orfe—and they fall victims to disease very rapidly. Even many of nominally more robust species like shubunkins deteriorate under conditions that experienced fishkeepers would regard as being ideal for most coldwater fishes, and the answers continue to elude us.

It has been noted by a number of pondkeepers in recent summers how often golden orfe in

particular succumb to hot, thundery, weather conditions, and there has been no conclusive answer to this tendency. I have experienced this also, but it has been interesting to note that similar native fishes like roach and rudd came through unscathed. In my local conditions I have assumed that the large amounts of pondweed of different species had contributed to an overnight build-up of carbon dioxide which the sluggish weather conditions of the following day had failed to dissipate adequately for the tolerance limits of orfe. As none of the specimens was particularly robust their loss was not altogether unexpected, but I am afraid that I have the greatest reluctance now to buy imported orfe-like fish at all, though one admittedly does see the odd good importations from time to time.

The conclusion one may well draw from this is that the long and tiring journey from overseas, coupled with the curious idiosyncracies of the climate of these isles, really sorts out the weak from the strong during the spring and summer, and that all that is worth having is what has survived in the dealer's tanks as late as the autumn. In buying then one may well assume that the fish is at least stronger than those who have fallen by the wayside, but against this is the virtual certainty that it has not been fed on a very grand scale. On balance, though, I doubt whether the fact that dried food has almost certainly been used throughout is anything to worry about. The quality of dried food has got better and better all the time and provided that the fish have been accepting it, they should be



Young healthy golden orfe readily take to garden pond life although the orfe is a fish particularly likely to be in trouble if water temperature goes up.

tolerably equipped for overwintering outdoors. Fish which are known to be late importations should, of course, be overwintered under protected conditions excepting in the very mildest parts of the country; by the second winter they should have adjusted satisfactorily.

On the basis of this reasoning I would certainly buy in spring and early summer only if I were certain that I was getting home-produced fish, and I would defer buying imported fish until at least late summer. This policy would be modified in the case of goldfish and shubunkins, which are far less worried by the climatic (thunder) conditions that take such a terrible toll of those slimmer fish which demand buoyant, highly oxygenated water. But even in these cases it does no harm

to wait until the first 'panic' buying is over, the weather has (perhaps!) improved, and the weaker ones have taken their departure. Having got your fish, regular feeding with earthworm, whiteworm and a good grade of pondfish food should make something of a foundation on which to build.

There once was a theory that coldwater fish are absolutely no trouble, but as many of them come from far warmer areas than ours we need to consider their needs more carefully than those of the neon, for example, who comes from a warm place and is automatically assigned a permanent warm place in our indoor aquaria. Use rather more than a little thought, therefore, when deciding what to do with your pond fish, and the starting point every time is where they were bred.

Is It New to You?

Five out-of-the ordinary or unidentified species included in recent tropical fish importations



Fishes owned by
DEREK LAMBOURNE

Photographs by
CLIFF HARRISON

Commonly known as the spollo shark, *Luciosoma setigerum* (above) comes from Thailand, Indo-China, Sumatra and Borneo. In the wild it grows to about 10 in. (25 cm) in length. A very lively fish that swims mostly in the upper levels of the aquarium. Most foods are eaten by this species but flies and caterpillars are preferred items of diet. At the bottom of this page is a picture of *Microplon's oter*, an attractive member of the Pimelodidae family, from Brazil. It has no common name. A fairly lively fish, growing to about 4 in. (10 cm) long

QUITE a few hobbyists welcome the chance to buy a 'new' fish variety or species and are happy just to be keeping something about which little is known and which is out of the usual line. Derek Lambourne is an aquarist who is particularly diligent in seeking out the odd 'unidentified' species included in importations of common species of tropical fishes, and he has obtained several interesting and unusual specimens. Derek and his wife Pat do not leave it at that, however. They make every effort to identify their new fishes positively, and with the co-operation of Dr Keith Bannister of the British Museum (Natural History) they have spent many hours searching records to try to name their fishy oddities.

Derek and Pat have even been able to provide the Museum zoologists with information to help resolve differences occurring in young and adult specimens of armoured catfishes, which until recently had caused much confusion. Derek, show secretary of Rochampton AS, has been specially fortunate in finding importers who can pinpoint the geographical origins of their shipments—important information for identification; South America is proving to be a treasure-house of species not previously seen alive in the U.K.





The catfish pictured above has not yet been conclusively identified (7 *Oxydoras niger*). It has a row of spiny scales on each side. It is from South America and is a member of the Doradidae family. The probable full length is about 12 in. (30 cm).



A fish whose identity is still the subject of research is the species of *Pimelodus* shown above. It is from South America, probably Venezuela. Overall colour is grey with black spots.

The dark-loving African catfish shown in close-up below is thought to be a species of *Chrysichthys*. It is a member of the Bagridae family and comes from the Congo region. The aquarium for this fish should not be brightly illuminated; it is fully active only at night.



Four Species of Water Plants for the Connoisseur

By W. A. TOMEY

Hottonia inflata

Bolbitis heudelotii

Rotala macrandra

Schismatoglottis sp.

Photographs by the author

IN important shipments of common well-known aquarium plants, from time to time we find 'new' plants that appear to be useful for the aquarium. Often these so-called 'new kinds of aquarium plants' are very expensive, and we can never be sure that the plants will grow in our tanks and so we suffer disappointments.

On the one hand this is caused by our ignorance of the circumstances of the growth of the plants in their natural habitat and on the other hand, transport conditions and chilling during transport can affect the plants in such a way that we cannot save them from death. In addition, many 'aquatic' plants have subsequently turned out to be 'bog plants' or stream-bank plants, which do indeed grow in very moist situations, but they die if they are kept continually under water!

The percentage of really useful new plants is also very small, and I am glad to have the chance to describe four new really suitable aquarium plants. All four are beautiful in form and colour, which makes them very suitable for all tropical aquaria. Two of the plants are rapid growers, and although the other two grow less quickly they are nevertheless excellent aquarium subjects.

Hottonia inflata

In small streams around Caracas (Venezuela) a Dutch aquarium hobbyist found some time ago a small but beautiful bright-green plant, *Hottonia inflata*. This plant develops very well in the aquarium, especially with powerful lighting, but it is also important to provide a somewhat loose nutritious bottom medium, wherein the fine white roots can make their way easily. If these conditions are not satisfied, the plant will

not grow and will lose its leaves, mainly at the lower parts of its stem. Depending on the lighting, the leaves show some variability in form; the same can be observed in water wistaria (*Synnema triflorum*).

When *Hottonia inflata* grows to 3-4 inches high, new branches arise, each bearing a new plant. These can serve as slips or cuttings for planting and so we are able to create a 'bed' of beautiful small foreground plants in the aquarium.

To keep these light-requiring plants low is very easy, especially if they are placed just behind the front pane of glass, so we can obtain the most beautiful colour and form effects. This is one of the best aquarium plants I ever saw!

Rotala macrandra

During a visit to India a hobbyist from Amsterdam found there a marvellous aquarium plant named *Rotala macrandra*. Until then importation of aquarium plants from India was restricted to some kinds of *Hygrophila* and *Ludwigia*, so we now have one kind more and a very beautiful one too.

Rotala macrandra was found in small lakes, creeks and deep bogs a distance of 500-600 miles south of Bombay. The plants can reach a length of 20-24 inches and they exhibit a reddish stem and soft green-rose leaves.

I suppose it must be a true water plant, because the plants are very fragile. Depending on the lighting, the leaves are more or less reddish coloured, which in combination with other aquarium plants gives a very fine effect. If fluorescent tubes are used, the leaves become a more

powerful red colour and with normal electric bulbs they become more green.

With a somewhat loose bottom medium and the proper lighting, *Rotala macrandra* grows strongly and forms new branches, which supply



Above: a fine combination—*Huzania inflexa* in the foreground with *Rotala macrandra* growing behind it.

new young plants. These plants must be handled very carefully, and they seem to grow best on a bottom of unwashed coarse river sand mixed with peat dust. Newly imported plants may require special attention. If they have not been very carefully transported, and also roughly handled, not long after they are put into the aquarium they soon start decaying.

Rotala macrandra needs a rather high temperature, 77-82°F (25-28°C) and these plants are very sensitive to temperature fluctuations, which can happen suddenly during transport, etc.

A fine and beautiful aquarium plant.

Bolbitis heudelotii

This plant originates from West Africa, where it grows wherever the circumstances are favourable. The required temperature is 72-82°F (22-28°C). No special bottom medium is required since this plant grows best on peat-wood and coarse stones. It is a typical fern, of the family Polypodiaceae, with stemmed leaves, a rhizome and roots, both somewhat hairy. In colour this beautiful fern is transparent 'bottle-green'; the leaves are very thin, through which the finely divided ribs are specially accentuated. The somewhat coarse roots and rhizomes are green, but they are covered with a kind of dark-brown 'hair'.

The well-known French ichthyologist Dr Gery was one of the first people to introduce *Bolbitis heudelotii* as an aquarium plant. Another French aquarist, Mr J. Arnoult, collected 100 plants, which he imported to Europe.



Right: with patience from the aquarist *Bolbitis* can develop into the fine plant seen in the centre. When first planted a specimen may seem not to thrive, sometimes taking 6 months before obvious growth occurs. Peatwood is the best growing surface for it.



When first obtained the African fern *Bolbitis heudelotii* looks like this

All the plants died during aquarium cultivation, except one specimen, which was still alive after very slow adaptation. But now in Europe we find numerous descendants of that first plant!

Bolbitis heudelotii grows well in the aquarium, where it grows even in clear soft freshwater. It grows especially well in an aquarium with filtered, circulating water. Under such conditions the growth can be so rapid that in a rather small aquarium sometimes the plant becomes troublesome.

However, there is one very important condition; the plant must stay free! For example, in a crack of a piece of peat-wood or in a cink of a rock, if the rhizomes and the roots become covered over with gravel or sand the plant doesn't grow any more and the leaves become brown, until the plant dies.

Propagation of *Bolbitis heudelotii* isn't difficult and is comparable with the easy multiplication of the Java fern (*Microsorium pteropus*). Each piece of the rhizome bears one or more leaves and is able to form a new young plant. Dividing the rhizome is the right way for propagation, but this can be done only if we have full-grown plants available.

Bolbitis heudelotii is a very beautiful aquarium introduction.

Schismatoglottis species

From Malaya-Singapore a plant has been imported under the popular name silverheart, a name derived from the marvellous silver colour in the centre of the leaf around the main vein.

Schismatoglottis is really a plant from the water's edge, although it does survive under water very well. But with continuous culture under water, we observe that the plant does grow less strongly than in bog culture. I'm quite sure this beautiful plant is more suited to a vivarium or an aquascape; however, it can survive under water a long time.

In contrast to many other aquarium plants, *Schismatoglottis* is content with very moderate lighting. If these plants are used in the right places, we can obtain very decorative effects when they are planted together with other aquarium plants.



A very slow grower in the aquarium, this *Schismatoglottis* sp. from Malaya is a beautiful plant and will give its best in an aquascape

inter-club show with Lewisham AS.

... MR D. Jones of Southampton delighted members of **BASINGSTOKE & DAS** with his talk on 'General Fish Care and Breeding'; the lecture by Mr P. Halliwell of Clatford revealed some very interesting facts and members appreciated the useful pamphlets on the subject that he kindly distributed. Table show class winners have been: class B, Mr A. Marshall; a.o.s., Mr J. Jackson; novice, Mr A. Marshall; danios & minnows, Mr T. Taylor; a.o.s., Mr A. Marshall; novice, Mr Antony Marshall.

... **HARWICH & DAS** caters for tropical, coldwater and marine fish-keepers' interests and new members are always welcome. Meetings are held at Alma Inn, Harwich, the first Monday and third Tuesday of month, 8 p.m.

... BECAUSE of demolition the Montrose Social Club, Liverpool is no longer the venue of the **MERSEYSIDE AS**. A new venue will be announced shortly.

ASK YOUR DEALER
FOR

Brosiam
SPUN-GLASS SILK

... 21 MEMBERS and two visitors attended the January meeting of **STEVENAGE AS** and enjoyed a talk by Mr Robinson on 'Wood and root in the aquarium'. Next meeting, Bedwell Community Centre, 8 p.m., 7th March.

... MR A. Saunders won first and second places in the furnished jar class at **STOCKTON AS** table show (J. Mr Q. Watt). The class for a.v. labyrinth was won by Mr L. Osman (2, Mr D. Connelly; J. Mr A. Saunders) and that for large cichlids by Mr D. Connelly (2,

Mr K. Hornby; J. Mr D. Connelly).

... THE plaque for Fish of the Month at the January meeting of **PRIVATEERS AS** (Shipley, Yorks.), when a very successful auction was held, was won by Mr B. Morrell of Shipley.

... THE **CARSHALTON & DAS** is now to be known as **CARSHALTON, SUTTON & MITCHAM AS**. Meetings, first Monday of month, Hill House, Bishopsof Road, Morden. (Secretary, Mr L. F. C. Loveless, 39, Brunfield Road, West Ewell, Surrey, phone 01-397-8142), and the Society will particularly welcome visits by prospective new members.

... 'TOP spawning' and 'bottom spawning' killifish, were the titles of lectures given to **KEIGHLEY AS** by Mrs S. Gear and Mr J. Mosley respectively. Mr Ibbotson won in the fish of the month (livebearers) class in the table show, Mrs Taylor the a.o.v., Mr D. Masley the N.a.o.v. and Master Bardgett the junior a.v.

Meetings and Changes of Officers

BISHOPS CLEEVE AS, Show secretary, Mrs J. Hawkins (44 Barton Street, Cheltenham, Gloucester); Show manager, Mr P. J. Greenwood (10 Russell Place, Cheltenham, Gloucestershire).

BLACKPOOL & FYLDE AS, New secretary, Mr R. Walker (18, Laurels Ave., Blackpool).

BORSHAMWOOD & DAS, Chairman, Mr J. Croxall; vice-chairman, Mr H. Turner; treasurer, Mr R. Widdelidge; secretary, Mr F. R. Lord (14 Camerbury House, Borehamwood, Herts., WD8 1NF); 21-23) 21921; show secretary, Mr W. Widdelidge (home); social secretary and P.R.O., Mr D. Hounell (57, Kenilworth Drive, Borehamwood, Herts.; 01-951 3440); Meetings: 8 p.m. every second & fourth Monday, Community Centre Alan Lane, Borehamwood, Herts.; enquiries welcome.

BRIGHTON & SOUTHERN AS, Chairman, Mr R. Rice; secretary, Mr Bob Fountain (8 Dowland Road, Woodingdean, Brighton, Sussex); P.R.O., Mr S. Ford (12, Newmarket Road, Brighton, Sussex, BN1 3QG).

Bristol AS, President, Mr J. Phillips; vice-president, Mr B. Lind; secretary, Mr H. C. B. Thomas; treasurer, Mr W. How; Miss H. Morgan continues as registrar.

Bristol TFC, Meetings: third Thursday of month, the Black Horse, Old Market, Bristol.

CARSHALTON & DAS, New name: **CARSHALTON, SUTTON & MITCHAM AS**, Secretary, Mr L. F. C. Loveless (39, Brunfield Rd., West Ewell, Surrey; phone 397 8142). Meetings, first Monday of month, Hill House, Bishopsof Road, Morden, Surrey.

DURHAM AS, President, Mr J. Henthorn; chairman, Mr D. Jackson; treasurer, Mr J. Dennis; secretary, Mr M. Rotherham, 63 Clonva Road, Scafer, Cheshire; phone Bilcovey 2458; show secretary, Mr M. Woodley (115, Bains Avenue, Worsley).

EALING & DAS, Chairman, Mr J. Hooley; vice-chairman, Mr R. Sellers; secretary, Mr V. Valley (19 Oaklands Road, Hanwell, London, W3); treasurer, Mr G. Sutton; show secretary, Mr J. Batts (96A Valera Road, Acton, London, W3); social secretary, Mr D. Criss. Meetings: first & third

On 21st and 22nd April the **SCOTTISH AQUARISTS FESTIVAL** will be held at the Motherwell Civic Centre, and will be open to the public from 10 a.m. to 10 p.m. on Saturday 21st April and from 10 a.m. to 6.0 p.m. on Sunday 22nd April. The Federation of Scottish Aquarist Societies is hoping for first-class support for this venture from affiliated Societies, from whom alone entries are acceptable. There are 24 classes, and entries will be grouped under stands erected by the entering Society. Judging will be to FSAS approved methods and standards. Schedules can be obtained from Mr Duncan Forthingham, Secretary of the FSAS, 23 Royal Park Terrace, Meadowbank, Edinburgh EH8 5JB and the last date for receiving entries is Saturday, 7th April.

Tuesday in month, Northfields Community Centre, Northend Road, Ealing, London, W13.

EAST LONDON A & PA, President, Mr P. Campbell; vice-president, Mr Arnold; Mr Broden, Mr Field, Mr Patton; Mr Taylor; chairman, Mr M. Pearson; vice-chairman, Mr G. Green; secretary, Mrs P. Harris (86 Leigh Road, East Ham, London, E16); treasurer, Mr A. Harris; show secretary, Mr F. Vickler (13 Irons Way, Collier Row, Barking, Essex); show organizer, Mr J. Doss; social, Mrs L. Doss; programme, Mr D. Flack; editor, Mr A. Pinner; press, Mr K. Wightson; library, Mr C. Swearing; aquarist, Mr G. Arrow. Meetings: first & third Friday in month, Ripple Road School, Ripple Road, Barking, Essex.

FANCY GUPPY ASSOCIATION, BIRMINGHAM SECTION, Chairman, Mr G. Steadman; vice-chairman, Mr S. Croft; treasurer, Mrs J. Croft; secretary, Mr G. Becham; show secretary, Mr D. Becham; assistant, Mr D. Steadman; P.R.O., A.C. & L. Truman (phone Bristol 75128); editors, P. & B. Walker. Meetings: fourth Sunday of month, The Glebe Farm Community Centre, Stechford, Birmingham. New members welcome.

FANCY GUPPY ASSOCIATION, LANCASTER SECTION, Chairman, Mr J. Hutchings; treasurer, Mr P. Nicholson; secretary, Mrs S. Nicholson; P.R.O., Mr J. Swindell; show secretary, Mr J. E. Peck (5 Ridge Street, Ball, Lancaster); treasurer, Mr J. Meehan.

FANCY GUPPY ASSOCIATION, MANCHESTER SECTION, Chairman, Mr R. Young; secretary, Mr Danny Glen (16 Nutall Avenue, Whitefield, nr. Manchester); treasurer, Mr A. Clifton; show secretary, Mr J. Hooketh; assistant, Mr F. Campbell; P.R.O., Mr T. Haller. Meetings: second Sunday of month, 8.30 p.m., Longsight Hotel (near entrance to Belle Vue, Manchester).

HARWICH & DAS, Chairman, Mr J. Baker; secretary, Mr A. Green (12 The Ridgeway, Choverston, Essex, CO12 4AU);

THE 1973 FANCY GUPPY ASSOCIATION WORLD INTERNATIONAL will be held on **Sunday, 27th May, at the Globe Farm Community Centre, Stockford, Birmingham.** Show schedules are available from the show secretary, Mr D. R. Beacham, 17 Pylmore Close, Woodrow South, Hudditch, Worcs. The Show open to the public at 3.0 p.m.

treasurer, Mr M. Bed. Meetings: first Monday, third Tuesday of month, 6.0 p.m., Alma Inn, Harwich Club caters for tropical, coldwater, marine. New members welcome.

HENDON & DAS. Chairman, Mr H. G. J. White; vice-chairman, Mr K. J. Purbick; secretary, Mr B. A. Maynard (94 Cotswold Gardens, London, NW1); assistant, Mr H. C. Thompson; treasurer, Mr H. Wain; show secretary, Mr B. S. Thompson (17 Highfield Avenue, London, NW4).

HINCKLEY & DAS. New venue. The Woodfield Youth Centre, Rosemary Way, Hinckley, Leicestershire, 7.30 p.m., third Thursday of month.

HULL AS. President, Mr R. Poole; vice-president, Mr G. Roome; chairman, Mr T. Douglas; vice-chairman, Mr A. Douglas; secretary, Mr J. Parker; assistant, Mrs B. Bush (54 Handborough Drive, Wollaton Road, Ainstly, East Yorks.); show secretary, Mr G. Andrews; assistant, Mrs J. Stubbler; librarian, Mrs A. Hayward; publicity officer, Mr G. Hancock; treasurer, Mr G. Bush. Meetings: first and third Wednesday of month, Hall Railways and Ducks Club.

ILFORD & DAS & PS. New venue. Fulwell Cross Library, Barkingside, 7.30 p.m., (see in brief). Secretary, Mr R. Bath, 165 Heath Rd., Chadwell Heath, Romford, Essex.

KIDDERMINSTER & DAS. Chairman, Mr B. MacKinnon; secretary, Mr P. E. Allen; treasurer, Mr G. Dunn; show secretary, Mr W. Nixon.

KINGSTON & DAS. President, Mr H. Towell; chairman, Mr D. W. Ellis; vice-chairman, Mr D. King; secretary, Mrs J. Rowe (10 41 Mount Rd., New Malden, Surrey); treasurer, Mr R. Lelevo; show secretary, Mr D. Mackay; assistant, Mr J. Pollard; P.R.O., Mr E. Farley. Meetings: 1st & 3rd Thursday of month, St Luke's C of E Primary School, Elm Rd., Kingston-upon-Thames, Surrey.

LEEDS AS. President, Mr G. Linn; vice-president, Mr K. Bayner; treasurer, Mr J. Boothroyd; secretary, Mrs R. E. Merrill (55 Garfield Drive, Whitwick, Leeds 12, Yorks.). Meetings: second Wednesday of month, The Anglers Club, Burnstalls, Leeds 9.

MERSEYSIDE AS. New secretary, Mr B. Wilson (3 Thorpe, Skelmersdale, Lancs., WY8 8QU; phone Skelmersdale 44214).

MIXENDEN TFS. Chairman, Mr R. Elmhurst; treasurer, Mr G. Poole; secretary, Mr S. Lovell (74, Clough Lane, Mixenden, Halifax, Yorks.); P.R.O., Mr B. Turner.

NEWBURY & DAS. Chairman, Mr G. Smith; vice-chairman, Mr K. Lloyd; secretary, Mr G. Taylor (7 York Close, Newbury, Berks.); treasurer, Mr R. K. Lloyd; show manager, Mr P. Legg; show secretary, Mr G. Foster.

PORT TALBOT & DAS. Show secretary, Mr A. E. B. Fouracre (3, Cross St., Velindre, Port Talbot, Glamorgan, SA1 1AG).

RUGBY FC. New secretary, Mr P. Sherman (122 Frommle Road, Rugby, Warks.).

RUNNYMEDE AS. Chairman, Mr K. Smith; vice-chairman, Mr J. Garrard; treasurer, Mr T. Butler; assistant, Mrs T. Butler; secretary, Mr P. Cais (1, Manscote Road, Ashford, Middlesbrough; phone

39236); assistant, Mr J. Shepherd; show secretary, Mr M. Moore; assistant, Mrs J. Garra.

SALISBURY & DAS. Chairman, Mr T. Blanchard; treasurer, Mr D. Adams; show secretary, Mr G. Lupton (56 St. Francis Rd., Salisbury, Wilt.); secretary, Mr J. Grant (15 Paragon Green, West Harnham, Salisbury, Wilt.).

SCARBOROUGH & DAS. Change of venue. Second & fourth Thursday of month, The Delmar Social Club, New Queen Street, Scarborough.

SHEFFIELD & DAS. President, Mr K. Collier; chairman, Mr H. Burton; vice-chairman, Mr E. Smith; secretary, Mrs S. Blizard (62 Alwick Rd., Sheffield S12 1GE); treasurer, Mr E. Strain; show secretary, Mr T. South, 126 Woodburn Rd., Sheff. S12 9; social secretary, Mr M. Knight; editor, Mr J. Blizard.

WEYMOUTH AS. Chairman, Mr D. Rogers; vice-chairman, Mr J. Fancy; secretary and show secretary, Mr A. Worth (99 Queens Avenue, Dorchester); treasurer, Mrs B. Fitzgerald; show manager, Mr A. Fitzgerald; trophies and equipment, Mrs E. Hart. Meetings: 7.30 p.m., first Tuesday of month, The Assembly Hall, The Waverley Arms Hotel, Abbotsham Rd., Weymouth. Visits and new members very welcome.

ABINGDON & DAS. as a newly formed society, is finding it rather difficult to obtain good quality film sheets (slides) and tapes. Secretary Mr G. R. Hall, 24 Lower Radley Park, Abingdon, Berks, would be grateful if society secretaries or others having such items for hire would contact him at the address above.

Dates for Your Diary

Note your special dates in the PFM Aquarist's Pocket Diary 1973, now available 100p post free from PFM, 354 Garsin Lane, London SW17 6NY.

3rd March. FBAS Assembly, Covey Hall, Red Lion Square, London, WC1, 8.30 p.m.

4th March. KEIGHLEY AS Open Show, Victoria Hall, Victoria Park, Leekbush Lane, Keighley, Dist. (Mr J. Mosley, 11 Moorcroft Avenue, Outworth, Keighley, Yorks. BD21 7NE).

17th March. BIVERSIDE AS Open Show, St Saviour Church Hall, Colthold Road, London, W.12. Schedules: Mr W. Netherell, 13 Greenhead Road, Fulham, S.W.6 (phone 01-381 0276).

17th-19th March. ESSEX NORTH & EAST LONDON AQUARISTS' ASSOCIATION Open Show, King's Hall, Lower Clapton Road, London, E.8. Entries close 10th March. Schedules from Baths & Civic Recreation Department, London Borough of Hackney, 29 Lower Clapton Road, London, E.8.

18th March. DON VALLEY AS 1st Open Show, British Steel Corporation Staff Dining Rooms, Stockbridge, 19, Sheffield. Schedules: Mr G. A. Hoyland, 35 Haggerston Road, Gagebridge, Sheffield.

21st March. WORKSOP A & ZS Open Show, Worksop College of Further Education, Carlton Road, Worksop, Notts, S80 2LJ. Schedules: Mr P. E. Spittlehouse, 4 Deans Street, Worksop.

21st March. NELSON AS Open Show, Civic Centre, Stanley Street, Nelson, Lancs. Schedules: Mr H. Illingworth, 24 Barrowford Road, Colne.

21st March. TYNE TEES AREA ASSOCIATION FBAS Open Show, Longport Hall, Burnin Carew, Hartlepool, Co. Durham. Schedules available shortly.

21st March. BRITISH AQUARIST STUDY SOCIETY Lecture (Dr David Scott of St Andrews University). Meeting Room, Zoological Society, Regent Park, London, NW1. Tickets £3.00 from Mr F. Keene, Highcliffe, Old Hill, Woking, Surrey.

1st April. HOUGHTON & DAS Open Show, Philadelphia Welfare Hall, Houghton. Schedules: Mr C. A. Egan, 47 Longsire, Houghton-le-Spring, Co. Durham, DH4 1PT.

7th April. THURROCK AS Open Show, Arthur Street School, Arthur Street, Grays, Essex. Schedules: Mr A. L. Riddles, 4 Prin Place, Grays, Essex.

7th April. YATE & DAS 1st Open Show, Newnham's Cottage, Yate, nr. Bristol. Schedules: Mr M. Emery, 114 Sandridge Park, Yate; phone Chipping Sodbury 127545.

7th April. G8GB AGM, Cooney Hall, Red Lion Square, Hammers, London, E.20 p.m.

8th April. UXBRIDGE & DAS Open Show, GPO Social Club, Wilton Tye Lane, Yeading Lane, Hayes, Middx. Schedules: Mrs S. Woodhead, 21 Barbara Walk, West Drayton, Middlesex.

8th April. WARRINGTON AS Open Show (FNAS Rules), St Benedict's Y.C., Bell Hall, Orford Lane, Warrington, Lancs. Show secretary: Mr J. Higham, 44 Hood Lane, Satchell, Warrington, Lancs; phone 36026.

14th April. INDEPENDENT AS Open Show, The Public Hall, Ilkington Town Hall, Upper Street, Ilkington, Leicestershire, N1. Schedules: Mr E. Mason, 70 Middleton Square, London, EC1.

15th April. COVENTRY POOL & AS Open Show, Foleshill Community Centre, Foleshill Road (444), Coventry. Details: Mr S. Woodbridge, 12 Ridgeway Avenue, Streethale, Coventry or Mr D. J. Grant, 22 Cecily Road, Cheltenham, Coventry.

15th April. SHEFFIELD & DAS Open Show, Granville College, Granville Road, Sheffield 4 (nr. Midland Station). Schedules: Mr T. Smith, 176 Woodburn Road, Sheffield 9.

11st April. RUNNYMEDE AS Open Show. Schedules: Mr S. Garrard, Le Kings, Long Lane, Stannorth, Staines, Middlesex, or phone Mr K. Smith, Ashford 39236.

11st-12nd April. SCOTTISH AQUARISTS FESTIVAL, Motherwell Civic Centre. For details see page 569 of this issue.

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12nd April, **YORK & DAS** Open Show, The Folk Hall, New Sarwick, York. Schedules shortly; Mr P. Ross, 38 Dan Avenue, Dringthorpe, York.

15th April, **SOUTHAMPTON AS** Open Show, Avenue Hall, Beaching up to 12 o'clock, 2 judges. Details: Mr P. J. Brown, 213 Spring Road, Sholing, Southampton.

16th April, **TROWERIDGE & DA & PS** Open Show, Nelson, Haden Boys School, Troweridge, Wilt. Schedules: Mrs J. A. Burton, 17 Fulbaru Road, Troweridge, Wilt.

19th April, **BLAKEBOROUGH AS** Open Show, J. Haleborough & Sons Ltd Cannon, Brighouse, Yorks. Details later.

19th April, **LOYNE AS** Open Show, Priory Hall, Clons Street, Lancaster. Large car parks. Details: Mrs H. Butcher, 21 Lythall Avenue, Halton-on-Lane, Lancaster; phone Halton-on-Lane 524.

19th April, **MEDWAY AS** Open Show, New venue to be announced.

6th May, **DUKIERIE AS** Open Show, Full details later.

6th May, **ROEHAMPTON AS** Open Show, Details: Mr D. Lambourne, 7 Winkler Court, Finch Road, London, SW11 2AX; phone 81-223 1639.

6th May, **OSRAM AS** Open Show, Osram Recreation Hall, Refuge Street, Shaw, Oldham, Lancs.

11th May, **PORT TALBOT & DAS** Open Show, VMCA, Port Talbot. Show secretary: Mr A. E. B. Foucaux, 3 Cross Street, Valletre, Port Talbot, Glamorgan, SA13 1AZ.

12th May, **GLOUCESTER AS** and Open Show, Gloucester Education and Leisure Centre, Fairwick Road, Gloucester. Schedules: Mr M. Brooks, 114 Millhouse Street, Gloucester from February on.

12th May, **CRUYDON AS** Open Show, Sir Philip Gamsa Recreation Centre, Moorland Avenue, Craydon, Surrey. Schedules: Mr D. Smith, 3 Hindhead Way, Willington, Surrey.

12th May, **CORRY & DAS** Open Show, Corry Crox Centre, FRAS rules. Schedules: Mr A. Shaw, 176 King Street, Kettering, Northants.

12th May, **DERBY REGENT AS** Open Show, Sherwood Foresters Recreation Centre (Normanton Barracks), Overston Road (A5141) Derby, HAC signposted. Show secretary: Mr R. G. Harlow, 180 Mansfield Road, Derby; phone 44722.

17th-18th May, **SECOND NATIONAL WELSH** Open Show, The Central Hall, Torrypany, Rhondda. Beaching 17th May 12.30 p.m. to 12.30 p.m. 18th May. Details: Mr M. Williams, 122 Top Yrionop, Tyrbarnog, Rhondda, Glamorgan.

19th May, **SOUTHEND, LEIGH & DAS** Open Show, St Ginnans Hall, Rectory Grove, Leigh-on-Sea. Schedules from Mr L. C. M. Dunstan, 174 Trinity Road, Southend-on-Sea, Essex; phone Southend 411975.

19th May, **MERSEYSIDE AS** Open Show, British Legion Hall, Crosswood Avenue, Liverpool. Details: Mr Brian Hall, 123A Roughaniga Her, Central Farm, Liverpool L21.

20th May, **YEOVIL & DAS** Open Show, The School Hall, Church Street, Marnock, nr Yeovil. Schedules: Mr M. Hubbard, 62 Meadow Road, Yeovil, Somerset.

19th May, **WEYMOUTH AS** Open Show, Seavill Swimming Hall, Weymouth. Details: Mr A. C. Worth, 67 Queens Avenue, Dorchester.

17th May, **FANCY GUPPY ASSOCIATION WORLD INTERNATIONAL** Globe Farm Community Centre, Southford, Birmingham. Open to public 3.0 p.m. Schedules: Mr D. R. Shacham, 17 Pedmore Close, Woodrow South, Redditch, Worcs.

19th May, **BOSTON AS** Open Show, Blackfriars Theatre, Boston. Schedules: Mr S. Noble, 121 Wood Farm Road, Boston, Lincs.

22nd June, **FRAS** Assembly, Conway Hall, Red Lion Square, London, WC1, 2.30 p.m.

22nd June, **LOUGHBOROUGH & DAS** Open Show, The Sports Centre, Grandy Street, Loughborough. Schedules: Mr I. Pardy, 23 Cleveland Road, Loughborough, LE11 2SP; phone Loughborough 42715.

22nd June, **BOURNEMOUTH AS** Open Show, Kinross Community Centre, Pelicans Park, Bournemouth. Details: Mr J. V. Jeffery, 30 Brunner Avenue, Southbourne, Bournemouth, BH6 6JF.

9th June, **HAVANT & DAS** 2nd Open Show, St George's Hall, Waterlooville. Details: Mr V. B. Hunt, Causton, 220 London Road, Witley, nr. Portsmouth, Hants.

9th June, **VALXHALL MOTORS AS** Open Show, Details: Mr A. Philip, 45 Hollybush Road, Luton, Beds.

9th June, **LLANTWIT MAJOR AS** Open Show, Show secretary: Mr J. Edwards, Gwenton Mill Park, Llanidloes, Cowbridge, Gwent.

10th June, **HIGH WYCOMBE AS** Open Show, The Lane End Village Hall. Details later.

10th June, **GEN FOND & AS** Open Show, GKN Cussons, Salisbury Street, Darlington, Staffs. Details: Mr Ken Rowley, 156 Wolverhampton Street, Darlington, Staffs.

10th June, **LINCOLN & DAS** Open Show, Details: Mr H. Kuhn, 44 Sower Street, Lincoln.

17th June, **BISHOPS CLEEVE AS** Open Show, T.A. Centre, Arle Road, Cheltenham, Glos. Schedules: Mrs J. Hawkins, 44 Burton Street, Cheltenham, Glos.

17th June, **SALISBURY & DAS** Open Show, The City Hall, Fisherton Street, Salisbury.

17th June, **NORTHWICH & DAS** Open Show, Hartford Secondary Boys School, Chester Road, Hartford, Northwich. Details: Mrs D. J. Thorne, 28 Whitgate Road, Winsford, Cheshire; phone Winsford 2386.

17th June, **FANCY GUPPY ASSOCIATION, LANCASTER SECTION** Open Show, Giggoson Institute, Moore Lane, Lancaster. Details: Mr J. F. Peck, 3 Ridge Street, Balf, Lancaster.

17th June, **FREELANCE AS** Open Show, Averham Community Centre, Thurloe Street, London, S.E.17. Details: Mr J. Stepp, 52 Redwood House, Last Street, Borough, S.E.1.

17th June, **SWILLINGTON AS** Open Show, John Bessons School, off Hurwick Road, Leeds 14. Show secretary: Mr E. Stanley, 25 Goodwood Avenue, Kippax, nr Leeds, Yorks.

22nd June, **DUNMOW & DAS** Open Show, Foddes Memorial Hall, Great Dunmow, Essex. Details: Mr D. McManis, 37 Chapel Road, Rayne, nr Braintree, Essex.

24th June, **GOSPORT & DAS** 7th Open Show, Stubbington Community Centre, Stubbington, Hants. FRAS Rules. Details: Mr K. E. Ayling, 52 Founder's Way, Bridgwater, Gosport, Hants. PO15 6LR.

24th June, **ALFRETON & DAS** Open Show, Adult Education Centre, Alfreton Hall, Alfreton. Details: Mr B. Hocking, Parkview, 17 Coppice Drive, Eastwood, NG8 2PA (phone: Langley Mill 2104).

28th-30th June, **BRISTOL TFC** Open Show, Congregational Hall, Stapleton Road, Bristol. Details: Mr M. Ellick, 1 Buntington Close, Nailsea, Bristol.

1st July, **CHELMSLEY AS** Open Show.

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1st July, **THORNE AS** Open Show.
Details: Mr B. Banks, 40 Warren Road,
South Common, Thorne, Doncaster.

1st July, **EXETER & DAS** Open Show.
Further details later.

7th July, **GSGB** Quarterly Meeting.
Conway Hall, Red Lion Square, Holborn,
London, 2.30 p.m.

7th-8th July, **BOMFORD & BEACON-
THREE** AS Open Show. (Dagenham Town
Open Show) Central Park, Dagenham,
Essex. Details: Mr D. G. Kott, 74 Little-
wood Drive, Collier Row, Romford, Essex,
RM1 4QT; phone Hamford 67504.

14th July, **BASINGSTOKE & DAS** Open
Show, Carnival Hall Basingstoke. Schedules:
Mr R. Rich, 93 Pickerton Road, Basing-
stoke, Hants.

12th August, **NORTH STAFFS AS**
Open Show. Details later.

18th-19th August, **HARWICH & DAS**
Open Show. The Queens Hotel, Dover-
court, High Street, Harwich.

19th August, **HUDDERSFIELD TFS**
Open Show. Details to follow.

1st September, **FBAS** Assembly, Conway
Hall, Red Lion Square, London, W.C1,
2.30 p.m.

8th September, Combined **BRACKNELL,
AS, DIDCOT AS & READING & DAS**

Open Show. White Knights, Shinfield
Road, Reading. Details: Mr John Horsey,
4 Rickmans Close, Woodley, Bucks. (Phone)
Reading 46627).

9th September, **NEWBURY & DAS**
Open Show. Details later.

9th September, **NUNEATON AS** Open
Show. Details later.

12th September, **WESTON-SUPER-
MARE & D TFC** Open Show. St John
Hall, Oxford Street, Weston-super-Mare.
Details: Mr J. Clarke, St Judea, North
Street, Cheddar.

16th September, **BUXTON & DAS**
Open Show. The Pavilion Gardens, Buxton.
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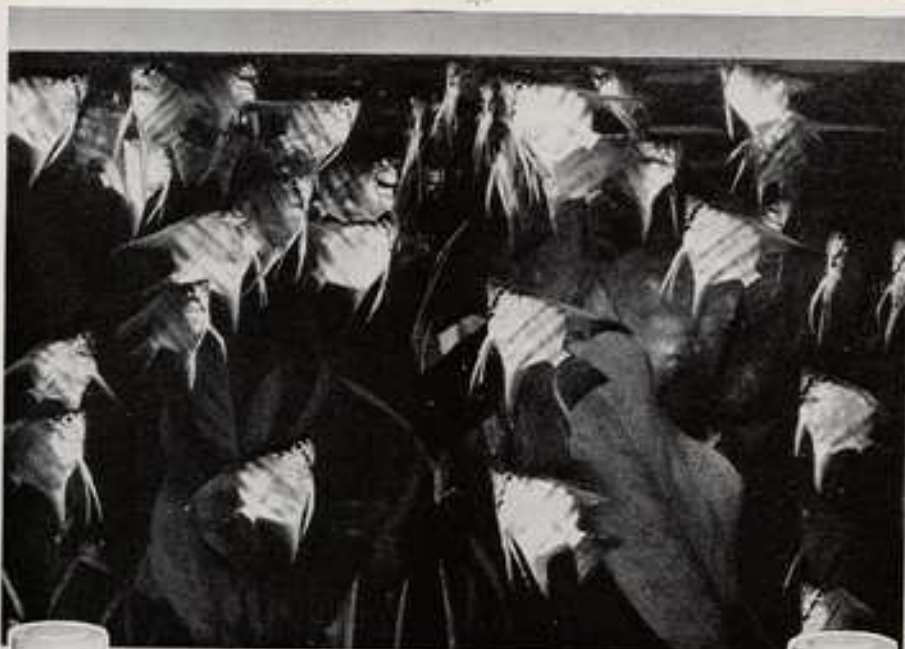
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