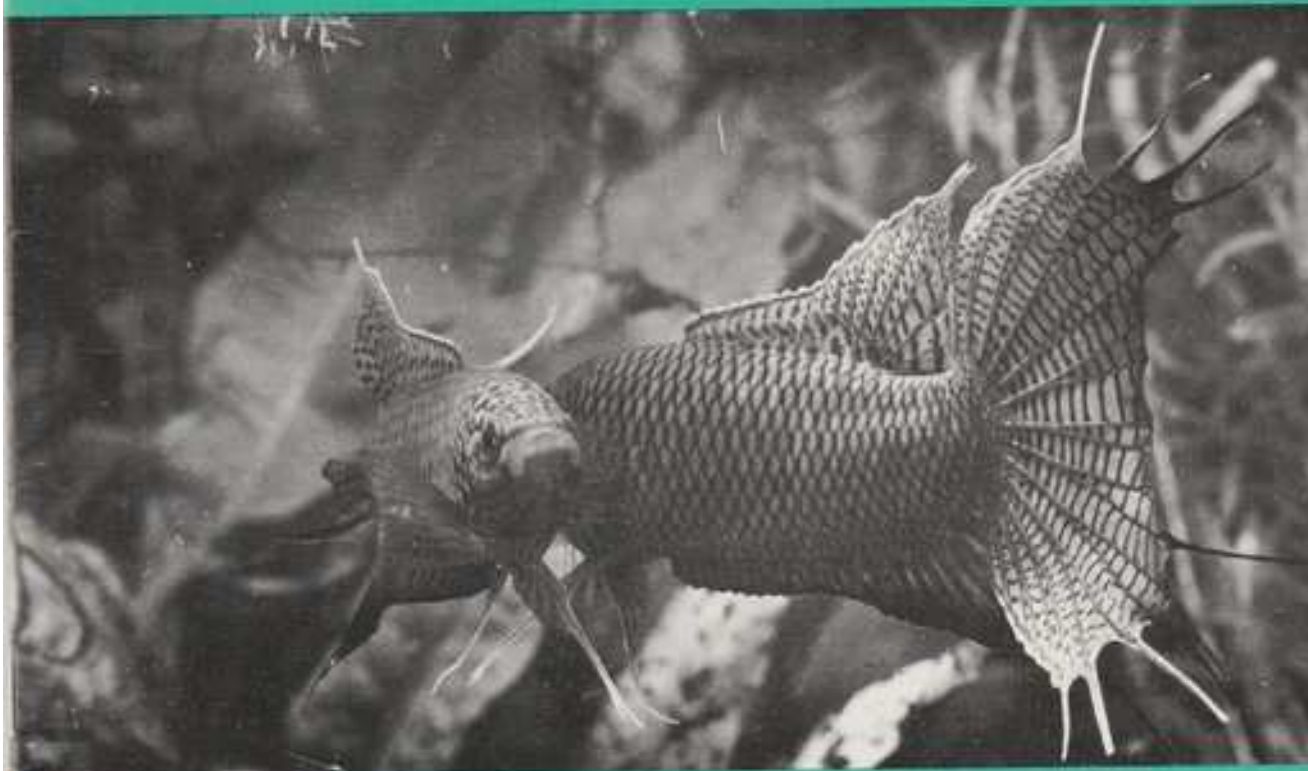


MARCH 1976

25p

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Comments and Quotes

- Springtime is pondkeeping time
- Aquarium weight
- The Aquarium Show '76

Making a Pond Time

THERE is going to be increased activity in gardens everywhere this year with so many people deciding that home-grown food can be cheaper than bought items. Fishkeepers in this group will have a good excuse to make a garden pond, so that their main hobby will be close at hand, as it were, whilst they cater for their family's needs.

We know that a lot of aquarium keepers are already pond-owners as well. Certainly we think that any fishkeeper with a garden who does not also have a pool, however small it may have to be, is not getting everything there is to be obtained from his hobby. And now, of course, is a proper period of the year to add a pond to the garden. Never before has it been so easy to do and never before has there been such a range of equipment and accessories to help the pondkeeper. So if you are among those with garden but without pond, steal a bit of the lawn and become a pondkeeper this year.

Once made and stocked, a garden pond will not make a lot of demands on your time but it will extend your fishkeeping into a new sphere as well as giving you an attractive addition to the garden. If you live in one of the more rural areas you will also be enhancing the environment by encouraging frogs, toads and newts, a sadly diminishing band in many parts of Britain, and also birds (although visits by herons or kingfishers are likely to make a pondkeeper feel that avian interest in his pond can be carried too far).

Weight Watchers

THE account in this issue of PFM of an aquarist's installation of a

large aquarium in the converted loft of his home prompts us to give a practical reminder to readers about the weight of aquaria. If you decide to have a tank on upper floors do make sure that it is on flooring close to load-bearing parts of the house, i.e. above or close to main walls of solid construction, and not where it is likely to be transmitting its weight to partition walls or unsupported flooring. It is easy to overlook the fact that even a 36 inch aquarium can be the best part of 300 lbs. in weight when stocked and such a weight distributed over three square feet is a force to be reckoned with! Such oversight can have truly disastrous consequences.

The Aquarium Show '76

ONCE again the Federation of British Aquatic Societies and PFM are inviting the participation of aquarium societies in this year's Aquarium Show at the Royal Horticultural Society's Old Hall, London (29th-31st October) in creating fishkeeping displays and informative exhibits of interest to the public. While some Societies will want to do this within the popular competitive section for Aquarium Society Tableaux, once again we remind societies that any bright idea for 'putting fishkeeping over' at the Show will be welcomed, and help in such presentations will be given by the organisers. Publicity for your Society, a helpful endeavour in the furthering of our hobby, plus some enjoyable evenings, can be the result of participation in The Aquarium Show.

MARINIST'S NOTEBOOK

Regular Changes of Sea Water

By ROY PINKS

IN reviewing my technique of marine fish-keeping with a view to building some sort of success on a shambles of failures, I tried to boil down to three or four main headings all the many points on which I could have made significant errors. As earlier indicated, I had to try to keep the whole thing simple. Neither I nor the average mariner can be interested in the long term in methods which are unduly irksome or expensive.

In theory there were numerous obvious omissions I had made — mainly in terms of equipment used, and I kept it minimal and inexpensive. I paid little real attention to aquarium chemistry, and once I had found that the fish had taken to a particular diet, I tended to stick to it. And so on. On thinking the matter over, the main points began to emerge, and I decided to carry out some reforms in order to assess the relative importance of these measures. From the scientific point of view this rather ad hoc programme would be ridiculed because there were no basic control factors to act as the starting points from which the subsequent changes could be measured. However, the majority of us are faced with the need to make the best of what we are given. Like a young child with a colour TV set and no book of instructions, a certain amount of knob twiddling and a lot of luck may sometimes yield a recognisable picture, and I made the assumption that so long as nothing actually seemed to regress, the course I had set should continue to be followed.

The most obvious variation in procedure was water changing, and yet there are still many mariners who would view this with some suspicion. There is no doubt that the effect on marine fishes of accumulations of their body wastes is very serious. The comparison of the marine with the freshwater scene in this respect is interesting,

because in the latter the only penalty of failure to refresh the tank contents seems to be a growing reluctance of the fish to reproduce themselves. This is a not unreasonable natural safety valve against overpopulation, and it seems that some form of chemical inhibitors gradually takes control of fish populations without killing them off. On the contrary, in the long term these controls tend to underwrite the survival of the species.

With marine fishes it seems that we have to realise that in the natural state the immensity of the oceans does not permit the accumulation of these wastes — they are diluted to harmless proportions as soon as they are emitted. Thus the marine fish does not experience the conditions encountered by the freshwater fish on the occasion of natural variations like droughts, floods and the seasonal shrinkage or growth of the pond or stream. Freshwater species are case-hardened to variations in water content, but the marine fish is in an altogether purer and more stable medium. It would therefore seem that, as our marine tank begins to mature, there is a rising graph of its acceptability to fish species, but after a later point the acceptability drops away, invisibly, until the pollution becomes so intolerable that the fish begin to show stress symptoms, or simply die.

My first assumption, therefore, was that Spotte's advice about water changes was well founded. There are impressive chemical equations in his books which convey all this to science-minded readers, but for general purposes the more burning questions are 'how much?' and 'how often?'. The answer to both lies in the

Continued on page 523

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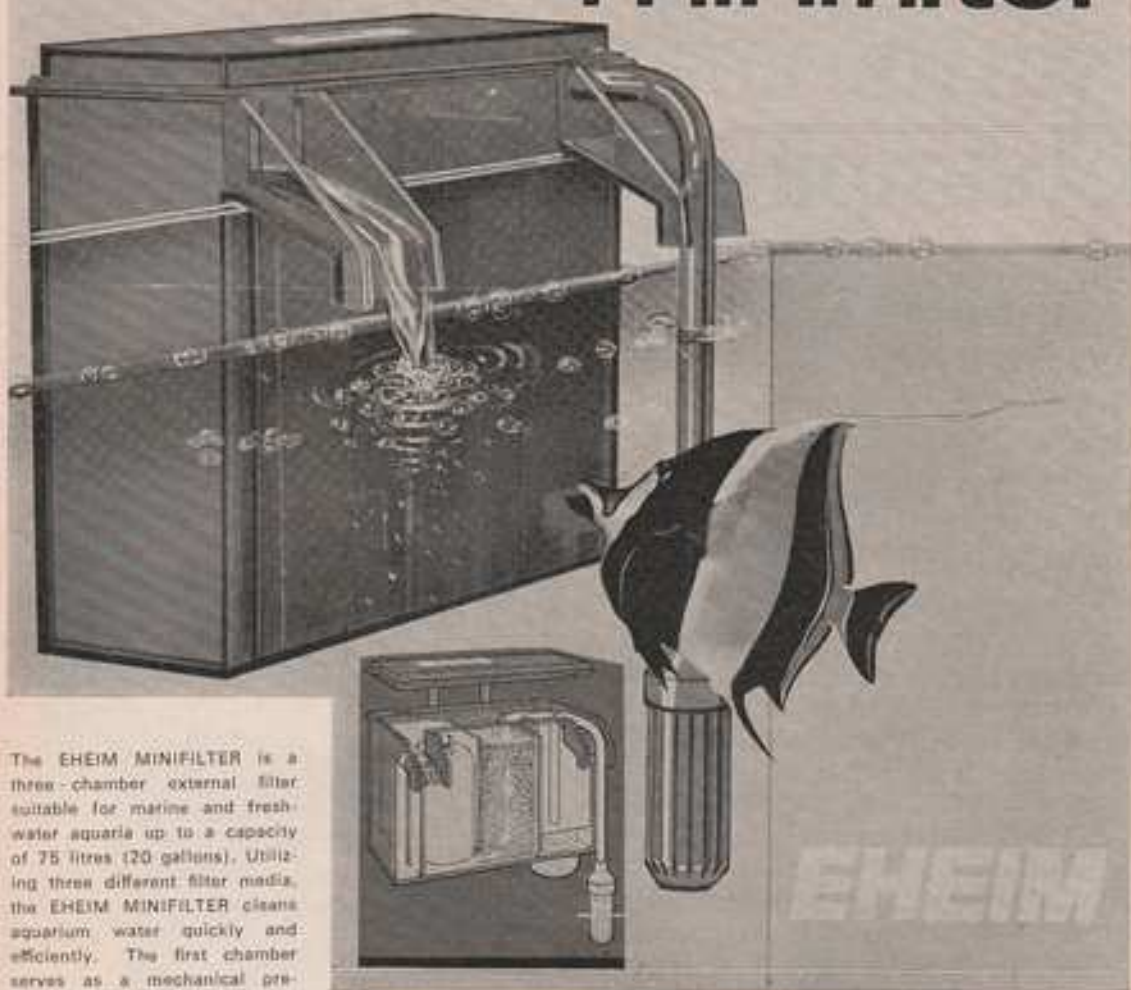
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FILTRATION REVIEW—3

Filters With Some Muscle

By CLIFF HARRISON

LAST month we looked in detail at air-operated filters, which, not least because of their relative cheapness and simplicity, comprise the bulk of the market. This month we examine the more limited variety of power filters.

Power filters have their own built-in water pump, operated (usually) by a small trouble-free induction motor which works at normal mains voltage. This gives them a number of advantages over the ordinary filters that require a separate air supply to work them. First, they can pump quite large quantities of water — upwards of 60 gallons an hour, before allowance is made for the 'slowing' effect of the filter medium and the debris it has already accumulated; for the largest pumps, this figure can be as much as 500 gallons an hour. Secondly, they are less affected by a fall in the water level in the aquarium, though the models that clip on to the top frame of the aquarium still require a fairly high level for the siphon tube(s) to work properly. Thirdly, power filters are generally less noisy than the combination of powerful air pump plus outside filter, unless the impeller bearings are badly worn (a common but easily rectified problem with magnetic-drive power filters that have seen a lot of use), or the motor itself has not been lubricated in accordance with the manufacturer's instruction. A final and, for some people, most important advantage is that the filter box of one particular design of filter — which is totally enclosed and watertight, and to which the water is conveyed through flexible plastic pipes — may be located some distance away from, and below, the aquarium it serves.

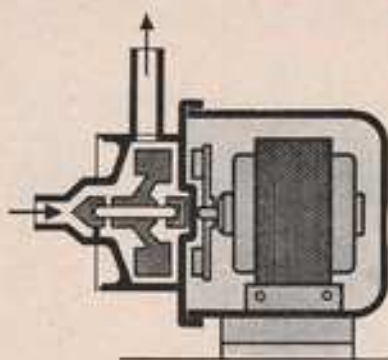
The limited demand in the U.K. for these power filters means, not surprisingly,

that the market is dominated by the foreign manufacturers, notably the United States and West Germany where the production of such expensive items appears to be a more viable proposition. However, this international scale of operation does mean that the principal manufacturers are solidly established, both in terms of the basic soundness of the products they offer, and the back-up service of spare parts. This latter aspect I rate particularly highly in view of the high capital cost of these filters; I know of many people who invested in various types of expensive aquatic equipment only to discover in due course that spares were virtually unobtainable.

Magnetic Drive

One of the earliest power filters to be widely available in this country was the Dynaflo, and its manufacturer's original single model is now the smallest in a range of three to suit a wide variety of aquarium sizes. All three models are broadly similar in design, featuring an open-topped transparent plastic filter box that attaches to the top frame of the aquarium. A motor unit slides on to the base of the filter box and, by means of a magnetic drive, powers a small impeller located in the perforated filter platform. For those unfamiliar with the principle of magnetic drive, it is worth providing a short explanation here.

Traditionally, the normal way of linking the motor (which must be kept completely dry and free from dampness) with the impeller or rotor (which must be totally surrounded by water if it is to work properly), has been by means of a short spindle passing through a watertight gland or seal. In practice, however, some wear can occur around such seals, which in turn can



Sectional view of a motor and impellor pump (Eheim) utilising the magnetic drive principle. Two magnetic rings are opposed on opposite sides of the division between pump housing (left) and electric motor housing (right). Arrows show direction of flow of water into and out of the impellor unit

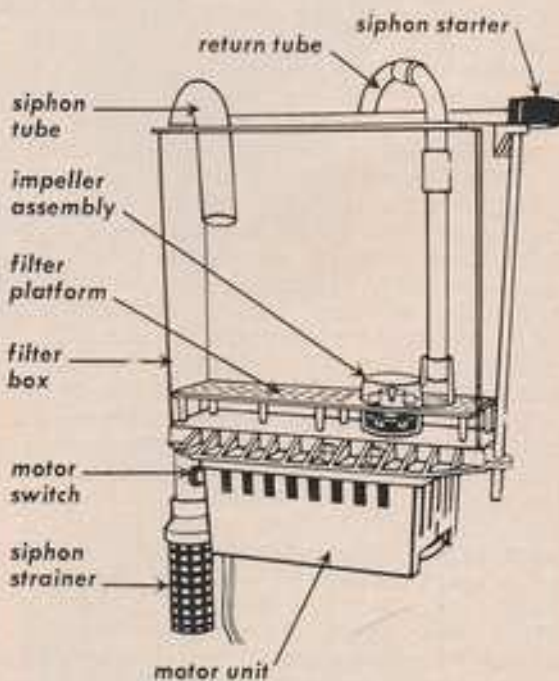
let water seep out when the pump is not operating, and air in when it is. With magnetic drive there is no such direct connection: two circular magnets are used, each an inch or so in diameter, one being connected to the motor shaft, and the other to the impellor. These magnets are then placed face-to-face, about $\frac{1}{4}$ inch apart, the impellor one on the inside of the filter box, the motor one on the outside. Sometimes they are located in a separate pump head unit, but the procedure is the same: the impellor magnet is inside the pump, the motor magnet outside. The magnet impulses are thus transmitted through the plastic and across the narrow air gap, and the impellor rotates in time with the motor. Since the plastic is one solid piece, there is no chance whatever of a leak at this point.

All three Dynaflo models employ a similar motor unit, and the principal differences are in the size of the filter box, the number of siphons used, and the number of return tubes. All the filter boxes are sufficiently deep to accommodate filter carbon or some other medium in addition to the normal filter floss, and a special gadget is supplied to simplify the task of starting the siphons. The big advantage of these filters is their price, which at £14.75, £18.64 and £20.62 for models 410, 425 and 430 respectively, puts them very much at the cheaper end of the 'power' market (the distributor does warn us

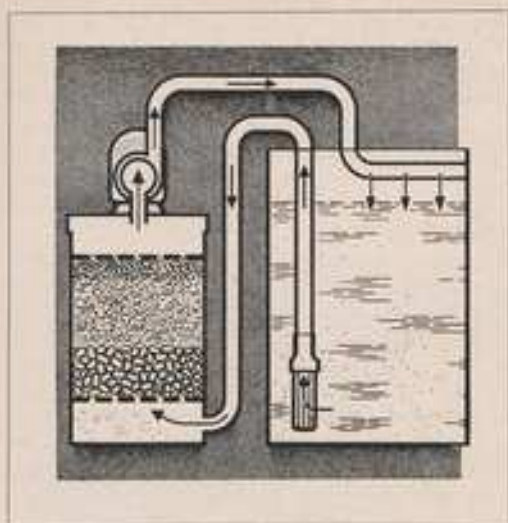
though that future shipments are expected to be substantially more expensive than this). A full range of spares is readily available, including the nylon ball bearing in the impellor unit which, as mentioned earlier, is the only part likely to need periodic replacement.

Eheim Range

The West German Eheim brand name embraces the most comprehensive range of 'power' equipment in addition to accessories such as a protein skimmer and various filter media. The best-known items are their self-contained power filters, where the filter box is totally enclosed: the water is carried to and from the aquarium by means of flexible plastic tubes of approx. $\frac{1}{4}$ inch outside diameter, and this ensures a minimum of disturbance and unsightliness to an otherwise attractive aquatic arrangement. It also means the filter can be permanently housed some short distance away, in a cupboard or below the aquarium, where it can be hidden from sight; the tubing supplied with



Dynaflo filter — a U.S.A. model at the lower end of the price range for power filters. The unit hangs from the aquarium top edge outside the tank



Above: typical arrangement of Eheim power filter and aquarium shown diagrammatically, with arrows indicating direction and route of water flow

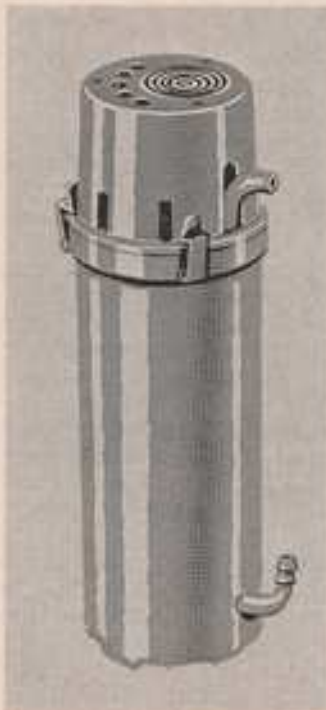
Below, left: Eheim filter model no. 2016 (approximately 11 cm. in diameter and 31 cm tall with a capacity of 1 litre; motor 28 watts)

Below right: one of the impellor pumps from the Eheim range (12 litres per minute) for use with filters or as water circulators

the filter can be extended a little if necessary, though it should be remembered that some loss of performance will be inevitable if the runs of tubing are excessive. However, many people prefer to switch these powerful filters around, from tank to tank as necessary - although there is risk of spreading disease in doing this - since a few hours' use every 2 or 3 days is usually enough to keep a normal aquarium perfectly clean. This application is particularly appropriate for fish-house use, and special hangers are available to clip the filter on to the aquarium frame.

The frequency with which the filter will need cleaning depends on the use it receives, and it is a simple matter to judge when the jets of water returning to the aquarium via the spraybar return pipe have slowed down. It is possible to use a series of graded filter media, from coarse to fine, in order to maximise filter efficiency, and Eheim produce a wide range of water-conditioning materials suitable for freshwater or marine aquaria (which may be purchased separately or with the filters), in addition to the purely mechanical filter media.

Prices of these filters range from £28.65



for the model 2016 (formerly known as the 388), recommended for aquaria up to about 25 gallons, to the 2034 (formerly 588) at £178.42 for the largest of conventional aquaria, having a claimed flow rate of 350 gallons an hour. Just in case these prices make power filters seem an extravagance, remember that all these electrical items now include VAT at the rate of 25%, in addition to the heavy increases we have recently seen in the costs of imported goods. Four other intermediate models complete the range to suit virtually any size of aquarium: almost all of these are now fitted with magnetic-drive pumps, though I gather the original direct-drive design rarely gave any trouble.

Many people might prefer to construct their own filter system *in situ* for a large aquarium, or arrange for a continuous flow of water through a number of interconnected tanks. For such people, Eheim offer separately a number of water pumps (including those used on the filters), and these can form the basis of very interesting water-purifying systems. The pumps can be easily connected to flexible plastic tubing of the appropriate dimension, and have a wide range of other uses — such as transferring water from the lower banks of aquaria to upper ones, and even emptying small pools. Eight centrifugal pumps are available, with various outputs and operating heads at prices between £22.95 and £81.71. A plain box-like filter unit is available which attaches directly on to a pump and fits inside the aquarium (supported on a special bracket). Made in different sizes to suit four of the pumps, it is a very neat and powerful unit; but for aesthetic reasons most people would probably prefer to fit it just occasionally, as required. Though the filter box has a rather limited capacity, its simplicity and ease of cleaning could make it ideal for using around a fish house. Prices range from £11.76 upwards, in addition to the cost of the pump itself.

The Eheim Minifilter, at £20.59, is a clip-on design to attach to the top of the aquarium frame, and naturally enough is motor-driven. With a claimed output of 35 gallons per hour, it features three separate filter chambers to accommodate a variety of filter media. It is suggested that a small, fourth, compartment could be used to house a small heater; this may well be possible (or alternatively the

heater could be located in one of the other chambers), but it would be essential to have the thermostat in close proximity if an accident is to be avoided in the event of a cessation of the water flow. A suitable combined heater-thermostat unit is currently being developed by Eheim, and we hope to bring news of it later this year.

To complete their range of aquatic equipment, Eheim offer us a Power Vacuum Cleaner (running off a miniature 12 volt motor via a transformer) at £24.71, a Protein Skimmer for marine aquaria (£33.79), a water-cooling unit, and two alternative arrangements of under-gravel irrigators from £10.04; these are not strictly speaking true undergravel filters, but rather a system of removing the debris that normally finds its way into the gravel. They have to be used in conjunction with one of the enclosed-box type of Eheim filters such as the model 2016.

Nuova Filters

The Nuova power filters also come from West Germany, and comprise three models — the Turbinette which is a circular, upright drum, and the Turbino and Turbo, which are of square cross-section. All three have a magnetic drive motor unit located on the top of the box.

The Turbinette is the smallest of the range, with an output of approximately 55 gallons an hour, depending on the location of the filter and the density of the filter medium used. Plastic tubing is supplied for one inlet and one outlet, along with the strainer and a spray head for returning the cleaned water to the aquarium; however, if desired, an additional inlet into the filter can be fitted so that water can be drawn from both ends of the aquarium at the same time. This requires an additional strainer, a length of tubing, and the breaking open of a sealed nozzle on the top of the filter. The box will accommodate approximately 8 inches depth of filter media, adequate for several different types or grades. In addition, the narrow partitioned segment of the box, which carries the down-flow of water to the bottom of the filter, may be used as an additional chamber for a coarse material, such as carbon, that does not unduly restrict the speed of the flow.

The Turbino and the Turbo are basically similar except for the height of the filter



Two power filters from the Nuova range: the Turbino (left) and the Turbo (right). Flow rates of 2½–5 litres per minute and 10 litres per minute respectively are quoted for these models

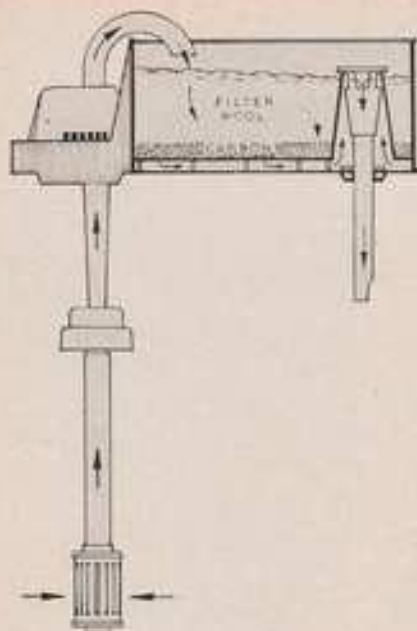
box and the flow rate of the pump, the Turbo having the greater capacity (135 gallons an hour compared with 65 gallons an hour for the Turbino). Each will accommodate two further intakes from the aquarium, for which additional tubing and strainers are required. The filter box of both models is divided by a vertical partition reaching almost to the bottom, and this gives in effect two separate compartments – the water being forced downwards in one and upwards in the other – to maximise their versatility and the effectiveness of the media used. As with all power filters, their effectiveness will depend on a high flow rate, and that in turn is directly dependent on their being cleaned out as soon as the water flow is noticeably reduced. It is also necessary to select suitable types of filter media, and Nuova have two of their own to recommend: Nuovalon filter wool and Nuovabon active carbon. Prices of the filters are: Turbinette £24.00; Turbino £27.38; Turbo £33.45, all prices including VAT. A number of accessories are available to increase the versatility of the Nuova models, including

a T-piece, angle-piece, extra tubing, a pre-filter unit and spring-clip suckers, in addition to normal spare parts.

Two other filters in the 'power' category are the Newpet Martin and the K.G. Products Beaver, though neither of these appears to be as widely available as those mentioned previously.

The Martin features an encapsulated motor unit which is located within the aquarium. There is only one moving part, and despite a claimed flow rate of 56 gallons an hour there is no danger of young fish being harmed by the filter. The motor, filter box and water return units can be arranged in a number of different ways, to minimise its obtrusiveness in the aquarium, and additional filter boxes can be purchased to increase its capacity and versatility. Manufactured in Germany, the unit's price is £23.30.

The Beaver, from Japan, is of rather unusual design in that it sits over, rather than alongside, the aquarium, and this means that it needs no siphon tube (gravity alone returns the cleaned water to the aquarium). Unfortunately I have



Sectional diagram of the Beaver 400 power filter, a product of the Japanese company Honda (KG Products, 165 City Road, Fenton, Stoke-on-Trent, Staffs). Filter area is 45 square inches and flow rate is approximately 6 litres per minute. The motor is rated at 5 watts. The unit fits on to a top corner of the aquarium.

not yet been able to test the Beaver, but it would seem that this arrangement would cause problems with the ordinary style of close-fitting cover. An output of 80 gallons an hour is claimed, the filter area being 45 square inches; with a suggested retail price of £13.80 (including VAT) it will no doubt find a ready market.

Diatom Filter

I have deliberately left until last the Vortex Diatom Filter, on account of the unique filter medium it employs. Unlike the other filters, which use nylon floss, activated carbon and a variety of similar materials, the Diatom filter relies solely on one filter medium - diatomaceous earth, a microscopically fine powder - to remove the most minute particles from the aquarium water. So effective is this medium that it is claimed to filter out particles as small as 1 micron - one millionth of a metre! This means that it will remove the 'free-swimming' stage of many disease-causing parasites, such as 'white spot', and if used correctly can help to control (and some would even say cure) such diseases. Its efficiency also means that it is likely to require frequent replacement of the diatomaceous earth filter powder, which is available in various sizes of packs; the average cost of a single



Left: the Martin, a German power filter unusual in being totally immersed in the aquarium. Additional filter boxes can be fitted to increase capacity. Flow rate is approximately 4 litres per minute (NewPet Ltd, 1 Brough Park Way, Brough Park, The Foss-way, Newcastle-upon-Tyne 6)

Right: the glass filter container of the Diatom filter (U.S.A.) has the motor unit mounted on its lid and the unit is connected to the aquarium via plastic tubing



'charge' works out at around 10p (it is not practicable to merely wash-out the old material).

A couple of limitations come to mind with this particular filter. The first is that the diatomaceous powder is not, to the best of my knowledge, totally inert in all circumstances, and could therefore alter the hardness or alkalinity of the water — particularly if the aquarium is small. And it is also not so easy to include water-conditioning materials — such as carbon or resins — within the filter body. However, its sheer efficiency — as demonstrated to many visitors at The Aquarium Show last year — is impressive. Such efficiency is possibly required more to rectify the occasional laxity of the hobbyist than to provide an essential aid to the well-being of the fish themselves. Manufactured in the United States, the Diatom filter costs £35.94; a special clip is available to attach it to the aquarium.

To conclude this review, may I suggest the purchase of a filter brush to keep your power filter working efficiently: not only do dirty tubes slow the water flow, they look untidy too. The long-stemmed Interpet Flexible Filter Brush, at 41p, and the Eheim Cleaning Brush, at 55p, make this a simple task.

Descriptive leaflets are available relating to a number of the filters mentioned in this article. If you would like more information, please write direct to the distributors below, enclosing a stamp to cover the return postage and clearly stating your name and address.

Eheim range: John Allan Aquariums Ltd., Dept. P., Eastern Industrial Estate, Eastern Way, Bury St. Edmunds, Suffolk.
(Please state products in which you are interested).

Nuova Filters: T.F.H. (Great Britain) Ltd., 13 Nutley Lane, Reigate, Surrey, RH2 9HR.

Diatom Filter: Vortex Innerspace Products, 43 White Hart Lane, London, S.W.13.

Marinist's Notebook

continued from page 510

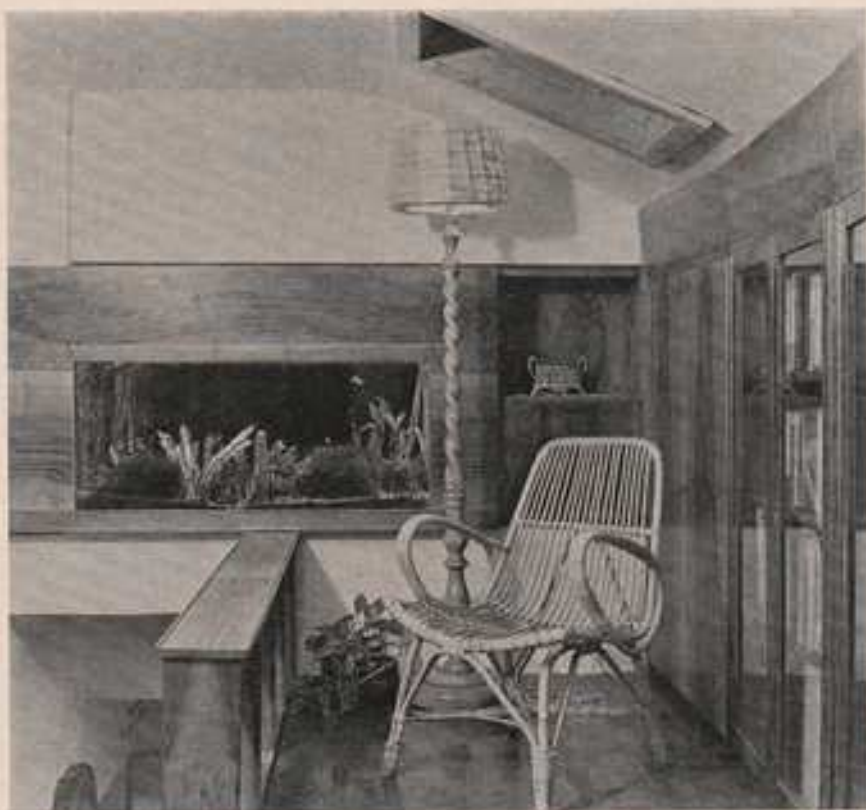
degree to which the aquarium is overcrowded (in the context of our argument, even a tank with one fish in it will be overcrowded at some point), and thus the aquarist will have to form his own judgment in the main. My own procedure began with replacing 5 gallons each quarter, but this did not seem to make much difference, so I increased this to 2 gallons at about 3 weekly intervals.

There were no tangible results at first — I continued to lose fish, but there was one factor which I had rather overlooked, and I will deal with this in my next article. It is important to add that the water changes I made were carried out in rather cruder fashion than I had believed would be

tolerable. I simply siphoned off a bucketful or two and then siphoned back into the tank mix a saltwater mixture at normal atmospheric temperature, using airline tubing as the siphon. I normally have a rooted objection to adding cold water to tank water, but there were no ill effects. A local retailer who has had some long-term experience of marines warned me against the practice because he had found that after each addition his fish had developed marine 'ich', so I must make the qualification that there may be some risk, though perhaps the danger lies in the method rather than with the principle of regular refresher doses of this suggested quantity.

If outbreak of a parasitic infestation such as 'ich' referred to above has occurred when a tank is cooled, this does mean, of course, that the parasites must have been present already and that the fish concerned cannot be considered to have been disease-free.—EDITOR.

Aquarium Room at the Top



EVEN the most beautifully set-up aquarium has to be placed in just the right position in a room to achieve a total effect, and if we want to attain visual harmony it is necessary to give a lot of thought to the choice of position and to the preparation of the area to receive the tank. Unfortunately, aquarists mostly, and far too easily, forget about the aquarium surroundings and apparently register the whole effect only infrequently. More often than not, we only really appreciate the relationship between the aquarium and its surroundings when someone else places us in front of a tank whose situation is the result of careful planning.

Some friends of mine have adapted the space under the roof for this purpose. A two-stage modern, open staircase leads up to the loft space and there glass-fronted bookcases have been constructed with this beautiful built-in aquarium. The aquarium and the partition in which it is placed together serve as a space divider, which gives a fine open-plan effect.

By J. ELIAS

Photographs by
the author

The two sides of the aquarium built into a partition made in the converted loft space are shown in the two photographs. To the left of the picture on the facing page is seen the stair well by which access is given to the loft



Bone Charcoal as Filter Medium

By JOHN MYERS

MAJOR advances in the technology of any field usually result from many years of research and patient development. Occasionally, however, by an odd combination of circumstances years of research are short-circuited to give a new product or technique way ahead of anything else available. Such results are described as a breakthrough - usually with justification. Recently, I was involved in a project which, quite by accident, revealed a material of great potential use to aquarists. This is exactly what happened.

During 1973 I was working as an industrial chemist with a large food manufacturing company. I was involved in work on a purifying agent called bone char,

which has been used for more than 50 years in the food industry. One evening I was about to leave for home when I realised for the third time in as many days that I had forgotten that lunchtime to buy some activated carbon for the filter in my community tank. I wondered if the bone charcoal would perhaps make do until I had an opportunity to buy some of the 'real stuff'.

My tank in the living room was by this time in a pretty bad way. I am sure you know the symptoms: too much of everything - fish, plants, algae, muck - all immersed in a liquid almost certainly unfit for human consumption! I refitted the filter in the usual way, with layers of

polyester floss and about 200 grams of the bone char.

Well, we have all heard of miracle cures and magic chemicals that work before your very eyes but the effect of this material was breathtaking. In an hour or so there was a marked improvement and by the following morning the water was crystal-clear and altogether more wholesome. I spent the next week busily distributing samples of the charcoal to my relatives and friends; my family all keep tropical fishes on the grand scale — our name will be known, for instance, to most who have bred and shown fancy guppies in the U.K.

All this was 2 years ago. Since then the bone char has been used in a number of trials and experiments by a group of a dozen or so enthusiasts and they all conclude that it really is something special.

For those of you who like to know how things work rather than just that they do work a few words on the chemistry of bone char may be useful. It has long been known that activated carbons have the power to remove certain materials from solution and hold them on the carbon surface by means of a weak chemical bond. This is the property exploited in the aquarist's use of activated carbons. You will know, however, of many disadvantages: activity rapidly decreases; the carbons cannot cope with exceptional loads; the fine powders tend to cake or channel; they are expensive.

Bone char is much more effective for

the aquarist's use because of its unique structure. Some 85% of each granule is a latticework of an inert, rigid material (calcium phosphate). This forms what can best be described as a microscopic, petrified sponge. The essential ingredient is still activated carbon, but in char it is spread in very thin layers over each and every surface and pore of the sponge. Because of this remarkable structure, the mechanical problems of activated carbons are overcome and the full potential of the absorption process is realised. The effective surface area is many thousands of times greater than an equivalent weight of ordinary carbon and the granules can be relatively large to prevent caking, because nearly all the effect is from their internal surfaces.

Our trials have shown no harmful side-effects: water pH is unaffected, hardness is not affected, and there are no sinister biological changes to the aquatic environment. Extensive tests have so far been concentrated on freshwater tropical systems but preliminary experiments with marine aquaria have been completely successful.

Bone char has been used for more than half a century as a refining agent in the food industry, hence its production in large quantities is an established technique. For this reason it is expected to be available at prices equivalent to or below that for ordinary carbon when the product becomes commercially available for aquarists.

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COLDWATER SCENE

By FRANK W. ORME

● **Encouraging the selected breeders** ● **Spring cleaning the pond** ● **Coldwater shows**

MARCH is the start of the new season of fish breeding for many fishkeepers, although in 1975, a year remarkable for a number of weather features, the month of March was described as the coldest since 1952, and it provided more frosty nights than any other month; also snow and some hail. Nevertheless, fish that were late spawning made up for lost time, as the weather improved, and the young fish made good growth. In fact, what at first had appeared to be the start of a difficult year for fish breeding turned out very well.

It is now essential that the selected fish should be given the best conditions and plenty of good food to bring them into that peak of condition that encourages the fish to spawn. Live foods should predominate in the diet. It is generally acknowledged that the finest of all foods for conditioning fish is the garden earthworm. Best of all are small red worms of around 2 inches long; these are tender, easy to cut into suitable portions for the size of fish, and are eaten with apparent eagerness.

Whilst the fish are being conditioned the opportunity should be taken to prepare their spawning tank. Use the largest tank that you have available. Make sure that it is really clean: give it a good wash out and then refill it. If the tank has previously contained fish it should be disinfected. This can be done by adding Dettol to the tank water, until this becomes milky; stir the mixture to ensure even distribution and leave for a week. After the period of disinfection the tank must again be emptied and cleaned, followed by repeated flushing until all trace of the Dettol is removed. Finally the tank can be placed in a position that receives the morning sun, filled with fresh tap-water, and left until the fish are ready to be placed in it.

After a time it will be seen that the female is looking noticeably plump, possibly being more distended on one side

than the other. The male will have small white pimples, known as tubercles, upon the first rays of his pectoral fins and also on the gill plates. These are the signs that both fish are coming into breeding condition.

Before plans are made to remove the breeders to the spawning tank, some thought should be given to ensuring that they are not carrying any unseen parasites. It would be pointless making sure that the tank is perfectly clean if you then used 'unclean' fish. There are a number of ways of disinfecting fish — some being safer and more reliable than others, but probably the easiest is to use the proprietary known as Sterazin. This is the medicament which I now use; the directions are easy to follow, no separate containers are needed and, most important, it is both safe and effective.

Only time and patience is now required, the fish are clean and the tank is ready. Continue to feed with liberal helpings of earthworm and siphon off any sediment or uneaten food. Take a look at the fish each evening and, when it is noticed that the male is lazily chasing the female, carefully catch the male and place him in the spawning tank. The spawning medium can now be added. This, naturally, must be free of pests. Either use previously cleaned plants or bundles of well boiled nylon wool or string (most coldwater breeders now use such an artificial medium), placed at the tank ends in sufficient quantity to form a thickish 'nest'. Do not introduce the female until shortly before you retire for the night; this will allow the male to settle down in his new surroundings. If, when the female is put with the male, he shows interest it is possible that the following morning may reveal the spawning act taking place. If the fish are found to be chasing wildly make no attempt to interfere; leave them to carry on the good work. At around

mid-day the major part of the spawning will be finished and the fish can be removed, before they start to eat the eggs. Should the fish not spawn, leave them in the tank and give small feeds of earth-worm until they do!

The eggs can be left to hatch naturally or the water temperature can be gradually raised to 70°F (21°C) to give a quicker hatching. After a time the newly hatched fry will be seen hanging, like small glass splinters, from the spawning medium and the tank glass. Within a day or two these minute fish will be darting around in their search for food and can be offered newly hatched brine shrimp. Sifted daphnia, mashed whiteworms etc., can replace the brine shrimp as the small fish grow. Always suit the size of food to the size of the fish and allow ample amounts; at this age the fry will feed almost continuously and make quite quick growth.



There are some strange people around — they read politics into the most innocent of things! During January a letter appeared in the correspondence columns of THE BIRMINGHAM EVENING MAIL, in which a lady enquired whether anyone could explain how a number of olive-coloured fish had appeared in her goldfish pool. I answered the lady's question, in simple terms, explaining that they were more than likely young fish that had failed, as yet, to colour into the metallic gold of the adult. This change of colour, from the wild olive, is well known to most goldfish keepers, of course, but can be very puzzling to those who are not aware of the fact.

In due course a further letter was printed — "I have never read such a load of rubbish," the writer stated, and continued: "Experts are our trouble. No wonder the Prime Minister gets away with the Chrysler fiasco. We are too educated to have any commonsense. The Government, the churches and the do-gooders are the trouble with their stinking sentiment! Words fail me for further comment!"

I found this reaction amusing — for, try as I might, I could not see what goldfish had to do with politics or religion, although this gentleman (?) could obviously have explained the connection. As it happened the lady who had posed the question replied, in moderate terms: "Who would

have thought that my poor little goldfish would get all mixed up with arguments about the Government and Chrysler. Come, come Mr ———, where is your sense of humour? The information about goldfish was of great interest to me and a lot of other readers who keep goldfish. Thank goodness for a newspaper that will publish what Mr ——— describes as 'rubbish'".

I make no comment, other than to hope that readers will find as much humour in this episode as I did.



This month, and next, provide the ideal weather for giving a spring clean to the garden pool. The plants have not yet begun the vigorous growth of the new season and will not, therefore, be set back by any thinning out, or replanting. Almost invariably a large amount of silt will have accumulated, over the winter months, at the bottom of the pool. Both the pool and fish will benefit if this sludge is removed. Lower the water level until the fish can be netted and placed into other quarters. Take care that no fish is hiding in the bottom silt. After removal of all fish, the remaining water can be baled out and the remaining ooze can be disposed of on the garden. Scrub down the pool and hose down, to get rid of algae growths, and bale, or pump away, the dirty water. If thought necessary thin out the plant growth and replant where required. After the pond is filled again with clean water the fish can be floated in containers in the pool, to equalise the temperature, after which they can be allowed to swim free.

Despite what some may think, I clean my own pool twice each year, once in the autumn and again in the spring. Perhaps this is being over particular, but it does no harm. Large areas of water, obviously, do not require such regular attention. Nevertheless, these also require cleaning occasionally to prevent them silting up. All pools of still water are of a temporary nature and, if left to their own devices, will eventually disappear. Silt and other material will gradually lessen the depth of water. Marginal and bog plants will slowly creep further out, and as they do so diving vegetation and other debris will fill in the area between them and the shore. This rich area will be successively colonised by different plants until it becomes a dry area. Owing to this encroach-

ment, and the reducing depth, evaporation will become ever more noticeable allowing even greater plant coverage. With time only a hollow can remain to mark what was once a lake!

Note the depth of sediment, when you clean out your pool, and calculate how long it would take to fill the pool if it were not removed!

★ ★ ★

In the January issue of The Goldfish Society of Great Britain 'Bulletin' there was an appeal from Scotland. The letter, quite rightly, suggested that there must be a large number of people North of the Border who keep goldfish, either in aquaria or pools, who have no contact with other goldfish enthusiasts. The appeal was for these hobbyists to form a group in East Scotland, so that members could share their common interest, and interested persons were asked to write to Mr T. McLean, 92 Wardykes Road, Arbroath, Scotland. If any readers live in the area I would suggest that they contact Mr McLean, for

there is added pleasure when one can discuss experiences, and share interests, with fellow goldfish keepers.

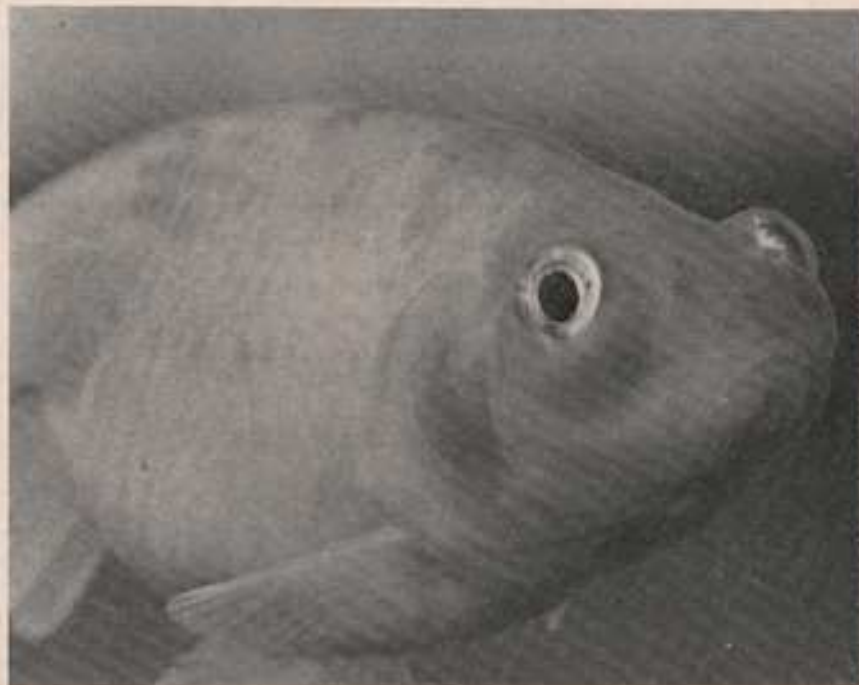
The GSGB publishes the bulletin at regular intervals and it usually contains much of interest to the goldfish enthusiast, and provides a link for many who, for various reasons, belong to no other society. Apart from U.K. members it also has a large number of overseas members from countries such as the United States of America, South Africa and Japan. Details of membership can be obtained from the secretary, Mr R. Dodkins, 107 Cobham Road, Seven Kings, Ilford, Essex.

★ ★ ★

The Midlands, this month, will act as host to two coldwater groups. On the 7th March delegates from the specialist goldfish societies will arrive at Foleshill, Coventry, to attend the second meeting of the newly formed Associated Goldfish Societies (details of this formation were given in the January issue of PFM.) Although it is too early to forecast what

Rare Goldfish Variety Comes to the U.K.

This is the 'toad head,' an uncommon dorsal-less goldfish variety owned by Mr Gerry Herring of SPASS, who believes he possesses the only seven specimens to reach this country. Now about 2 inches long, they were brought from Canada by a GSGB member and have settled down well in their new home. Known as the Hama Tou in Japan, the variety's peculiarity is the breadth of the head and the eye has features of both telescopic and bubble-eye celestial variety, best seen in the adult. (Photograph by Cliff Harrison)



effect the AGS will have on the future of the hobby, the potential for raising the standard, and status, of the goldfish is certainly within the scope of the member groups. With the continued goodwill, and co-operation, that has been a very pronounced feature of all the initial meetings, the delegates should be able to achieve much that will be of benefit to the goldfish hobby.

The other event, on 14th March at the Post House Hotel, Leicester, commencing at 11 a.m., is the seminar organised by the British Koi-Keepers Society, with a programme that should interest all coldwater fishkeepers.

This is also the start of the season of open shows, and one of the first will be the joint effort of the Association of Midland Goldfish Keepers and the Coventry P & AS on 11th April at the Templars School, Tile Hall Lane, Coventry. Details of the coldwater classes were given in an earlier issue of PFM.

During last year it was remarked, to me, on occasion that it was a pity that the less well-known open shows did not attract entries from a wider area than the near locality. As a coldwater exhibitor I would suggest two reasons for this. The main problem is that the majority of these shows make it a condition that exhibitors must supply their own show tanks. If a great distance is being travelled it presents sufficient difficulties to transport the fish, without the added burden of tanks, which then have to be filled before placing the fish on the show bench. If a few tanks were kept in reserve for out of town

entries, possibly more distant exhibitors would be attracted. Secondly, the number of coldwater classes, in a schedule, is far too restricted. The answer to that problem is quite obvious.

★ ★ ★

An excellent little booklet for the novice to koi-keeping (the more advanced will also find much of interest) is the 20 page **KOI-KEEPING FOR BEGINNERS**. The author is Mr F. J. Ayres, chairman of the Yorkshire Koi Society, and his plain simple style should be easily understood by even the non-fishkeeping reader. Chapters are devoted to the following subjects: Brief History of Koi; The Koi Pool; Pool Construction; Quality of Water; Filtration; How Many Koi; Types of Koi; Buying Koi; Quarantine Period; Plants; Snails; Illnesses and Treatments; Feeding; Pool Calendar; Recommended Literature and Koi Societies. Under these headings the subject is covered adequately and should guide the beginner along the right path and thus avoid some of the pitfalls that await the unwary. Copies are available from Mr F. J. Ayres at a cost of 58p post free (address 36 Manor Drive, Hilton, Yarm, Cleveland). The alternative is to become a member of the Yorkshire Koi Society at a cost of £5.00 per annum; this will not only entitle the new member to a free copy of the above booklet but also issues of the Society's monthly Newsletter, a copy of the Society's rules and a copy of the programme for the coming year. Applications for membership, or enquiries, should be sent to Mr D. M. J. Hollom, 54 Wilmer Drive, Heaton, Bradford 9, Yorkshire.

BOOK Review

Aquarium Life

LIFE IN THE AQUARIUM by Vanna Dal Vesco, Wolfgang Klauswitz, Bruno Peyronel and Enrico Tortonese. 248 pages; colour photographs and illustrations. Octopus Books Ltd., London, 1975. £7.95.

THIS book has both the 'how-to-keep-an-aquarium' and the 'look at the wonders

and beauty of underwater life' approaches, which is somewhat unusual. The nitty-gritty of practical details are in fact banished to 24 blue-paper pages at the end of the book, with the index, and the sumptuously produced main part gives a lavish display of excellent colour pictures and clear text arranged in sections: Plants, Animal Life in Relationship to Water, Freshwater Fishes, Marine Fishes, Amphibians and Reptiles, Freshwater Invertebrates, Marine Invertebrates. There are hardly any signs that the book was

written and first published in Italian, and to look at the superb colour photographs gives specially great pleasure; they are all the work of one man — Giuseppe Mazza. This book is first-class propaganda for the aquarium-keeping hobby and it well deserves to be put on the purchase lists of public libraries.

How Fishes Live

HOW FISHES LIVE by Peter Whitehead. Volume 3 of How Animals Live series. 160 pages; colour photographs and illustrations. Elsevier-Phaidon, London, 1975. £3.95.

A BEAUTIFULLY produced and well-written book that is bound to interest any aquarist. The author, an ichthyologist from the British Museum (Natural History), obviously kept the fishkeeping reader in mind when writing his text, just as his editor has done in furnishing the illustrations. So many books on the structure, function and habits of fishes have in the past been too concerned with species not likely to be seen in private aquaria. Here, the well-known aquarium favourites as well as the interesting not-so-well-known, along with those such as sharks and deep-sea types that can never be ours, are discussed in chapters on fish classification, life under water, locomotion, feeding, fish senses, breeding and growth, defence and on other aspects of behaviour and habits. The pictures and illustrations are excellent, the book is well printed and laid out and there is a detailed index. At just under £4 it is a well-recommended acquisition.

Catfish Information

CATFISH ASSOCIATION OF GREAT BRITAIN INFORMATION BOOK no. 1. 21 pages; line illustrations. D. Lambourne (7 Wheeler Court, Plough Road, London SW11 2AX), 1975. 50p plus 9p postage.

NINETEEN species of catfishes are featured by most exquisite line drawings with text notes in this first booklet to be published by the Catfish Association of Great Britain. Much of the information pre-

sented is not readily available elsewhere and any student of catfishes is bound to require this book. Aquarists seeking information of an unknown specimen can profitably include the book in their search material. Highest praise must be given to the compilers and to the artist, Derek Lambourne, for the evident care they have taken over this work. Few aquatic society publications have achieved its standard. It is unfortunate that advantage was not taken of the space available to include more notes on aquarium aspects of maintenance and breeding, for these are what most aquarist readers are likely to expect to see. For only two of the species are brief notes on breeding habits provided; even if 'no reports of aquarium breeding exist' has to be repeated page after page this is still worth while including because it resolves the question always in the reader's mind. Book no 2 and its followers will be eagerly awaited by all who see no. 1.

Practical Herpetology

KEEPING REPTILES AND AMPHIBIANS by Alfred Leutscher. 164 pages; black and white photographs, line illustrations. David and Charles Ltd., Newton Abbott, 1976. £4.95.

THE author of this practical manual for herpetologists is a well-known writer in this field, and in this latest work he serves the reader well who is seeking to start up in this hobby. In the opening 36 pages of the book various types of vivaria, aquaterraria and reptiliaries are discussed and illustrated, the figure numbers of the illustrations serving as a key to note the particular housing requirements of the species discussed in the later sections of the book. Reptiles most commonly acquired from pet shops are the young American terrapins, which require very special care if they are to live. Taking the position of an owner of these pets, who might be seeking information, the reviewer thought the relevant sections less helpful than they might have been. However, in general, reptiles and amphibians who find themselves in unwilling captivity will surely be much better off if their owner does what Mr Leutscher recommends for them.

The Black Paradise Fish



Macropodus opercularis concolor

THIS fish is very closely related to the familiar paradise fish *Macropodus opercularis* and, according to G. S. Myers, it is really only a sub-species of the latter that inhabits more southerly regions in Indo-China.

The black paradise fish, as it is known, was first imported from its home in 1935. It is a member of the large anabantid family and grows to just over 3 inches (8 cm.). In contrast to the well-known paradise fish, the black paradise fish has no diagonal stripes and during spawning the fish's colours deepen and become almost black, while its fins become red. Normally, apart from spawning time, it is a dark-brown colour, with well-developed finnage.

It is very easy to recognise the difference between the sexes in mature fish. The male is larger and his elongated finnage unmistakable. The female's fins are rounded. These fish are peaceful enough, apart from the spawning period, and can be kept with other species in a community tank. But when spawning, the males are rivals and they must be protected from each other by the breeder - otherwise their beautiful fins will be torn and sometimes severe wounds can be inflicted.

By RUDOLPH ZUKAL

Photographs by the author

Translated by F. MARSH

On the opposite page the male black paradise fish, with tautly spread caudal fin, is seen beneath the surface nest he is finishing. Here, two rival males indulge in a tussle while a female hovers placidly in the background



Many aquarists affirm that the maintenance of this fish is identical with that of the paradise fish, but personally I wouldn't like to stress this too categorically because in my experience the black paradise fish needs more warmth and requires a water temperature of at least 72°F (22°C) for health. They are also, as I have said, much more peaceful than *M. opercularis*.

Live food is required for feeding.

Propagation follows the usual labyrinth fish procedure with the male building a foam nest and the eggs being ejected underneath it. Black paradise fish are not ready spawners and this may help to account for the fact that they are a fairly rare sight in the aquarium. But this is certainly also due to the fact that aquarists



The female is being chivvied and pushed by the male to attain the submissive spawning state — both fish have folded finnage at this time

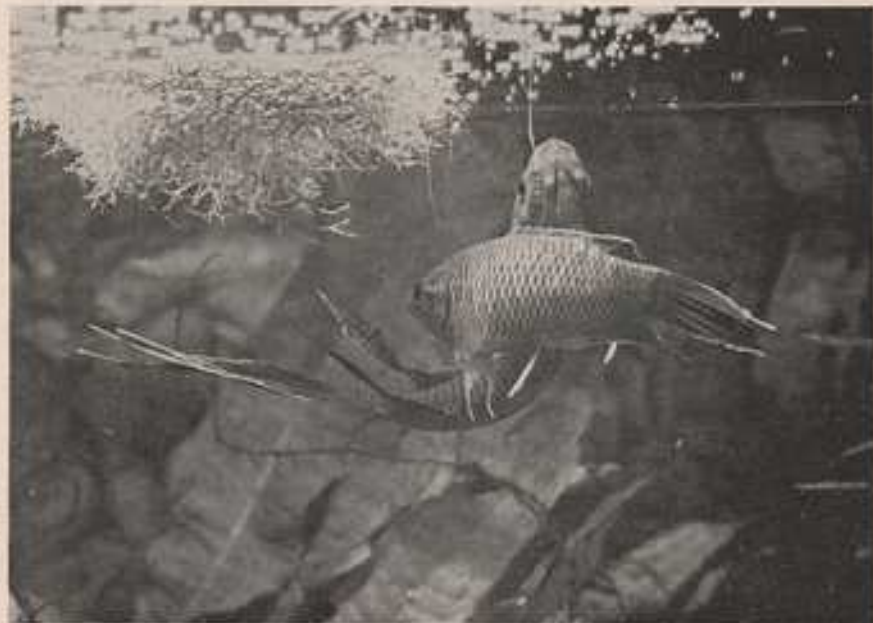


Now ready to spawn, the female takes up position beneath the nest. The male, the larger fish, now appears to increase further in size as he spreads his fins in pre-spawning display.

seldom have the opportunity of seeing them when they are 'coloured up'. In the shop tank they are often rather small, plain-looking fish, that give no hint of the beauty they will develop and so they fail to catch the fishkeeper's interest.

I keep my black paradise fish in a community tank with other species of fish, even neons, and although the black para-

dise are now fully grown and mature the other fishes have been quite safe. To breed them I prepared a 4-5 gallon (20 litre) tank with ordinary tap water that had been allowed to stand, with a few background plants present to give the female possibilities of hiding. On the water surface I placed a piece of floating plant and raised the water temperature to 79°F



As the male curves his body in close proximity to the female beneath the nest she swims into the curve and is embraced.

The female is turned on to her back by the male so that the egg opening is under the nest



(26°C). The first male I put in showed some interest when the female joined him but then spent much more time searching over the tank bottom for food than concentrating on his partner. So I added another male. Immediately there was a whirlpool of activity. With fins spread wide, the males swam round and round each other, though without inflicting any

damage. The female watched this for a while and then apparently decided to give her affections to the first partner and expressed this by staying near him.

When it became apparent that the fight between the rivals was beginning to develop and might produce serious results, I took the second male out and awaited further developments. It didn't take long



Eggs are released from the female and these rise in the water to lodge in the nest of bubbles.

and the nest was completed on the same day. I took the female out that evening, to replace her the next day, when the actual spawning took place then within a few hours.

This procedure takes the same form as that for the paradise fish or the fighter:

the female is chivvied into submission and once she is ready she takes up her stance underneath the nest. The male spreads his fins and curves his body into a circle into which the female swims, before releasing her eggs.

What's New?

Sealant and Equipment

A FULL range of Es-Seal Silicone Sealants and equipment is now available under the Singleton Es-Es label (Armitage Brothers Limited, Colwick, Nottingham NG4 2BA). The small 50-gram tube, with a retail price of £1.15, is suitable for repairing tank leaks and making up a 15-gallon (2 ft.) tank. For the keen enthusiast and the professional, there is the 325 c.cm. cartridge, which should be used in conjunction with the applicator gun. One cartridge (retail price, £5.75) is sufficient for six 18-gallon (3 ft.) tanks. Retail price of the applicator gun is £3.20. A comprehensive leaflet is included with each Es-Seal product, giving instructions on sealing tank leaks and making up all-glass aquaria.

Unobtrusive UG Filter

MANUFACTURERS of aquatic equipment continue to be very conscious of the need to free the aquarium of clutter caused by too-obtrusive equipment, and the Aqualonic Filta-Bed (Hillside Aquatics, 29 Dixons Hill Road, Welham Green, nr. Hatfield, Herts., A19 7EF) is a new undergravel biological filter designed with this principle in mind. Made of green compacted polystyrene, the filter plates lie flat on the tank bottom; they are moulded on the under-side into grooved channels, slotted for water entry. The filter's unusual aspect is that the action of the air-lift tube is now performed by a short rectangular block of the same material attached to the

filter plates. The green airline supplied fits directly into this, with slotted egress for the air bubbles. The 2 in. high block is easily camouflaged, since less than an inch of it protrudes from the gravel. Extension blocks are available for use in tanks with very deep gravel. Four sizes of filter are obtainable, 17 in. by 9 in., 23 in. by 11 in., 27 in. x 11 in. and 38 in. x 11 in., and the manufacturers state that, depending on the air flow available, turnover rate can be increased to as much as 90 gallons/hour.

Everything for Pondkeepers

THE Book of Ponds & Aquariums is the title of the 1976 publication issued by Wildwoods Water Gardens Ltd. (Theobalds Park Road, Crews Hill, Enfield, Middlesex, EN2 9BW), which is both a brochure of their services and a source of helpful information to the newcomer and novice in the water-gardening hobby. Every aspect of setting up and maintaining the pond is covered from types of ponds available, pumps, fountains and waterfalls and accessories to choice of fishes and plants. Half-tone illustrations and black and white drawings illustrate these sections and there are two splendid 8-page sections in colour on cold-water fishes and pond plants. Another 4 pages are devoted to aquarium-keeping basics and plant collections available (Wildwoods Tropicana) for tropical or unheated tanks. The information is given in a friendly, uncomplicated style that should re-assure the most anxious prospective pondkeeper that he is getting sound, practical advice. Price 25p from Wildwoods.



by
ARPEE

Personal COMMENT

IN considering the selection of suitable species for a freshwater community tank we may conveniently divide candidates into two main categories — primary species and secondary species. The former are those which are distinctive enough in all ways to enable them to stand alone, so to speak. The latter are those which play a complementary role, and which are generally regarded as less interesting than the more striking names. I think it is a great pity that these lesser lights should have come to be damned by faint praise, because many of them are contenders for a place in most collections in their own right, but somehow they get passed over.

We have come to call fishes like these 'foil fishes', because they act as a quiet background for the more garish species. The tendency is for them to be in the category of silver coloration, often with buff-green upper parts. They thus resemble the duller of our native fishes, but as every coldwater enthusiast knows, if you assemble these in the right surroundings they take on undreamed of attraction. Perhaps, to get the maximum effect from fishes of this sort it is necessary to show them in rather large shoals, and as they are not very emphatic viewed in the dealer's tank, there is no great incentive on the part of the buyer to buy many of them at any one time. Thus an opportunity is immediately opened up for the collector. He can buy lots of individuals or pairs of foil species in the certain knowledge that they will all merge into an agreeable background for his other fish.

I have stressed many times that it is foolish to buy just one pair of neons or cardinals for a community in a 30 gallon tank, as they simply get lost. The smaller tetras should be bought in dozens or tens,

and the trade should encourage the habit by allowing good discount for such quantity purchases.

The reader must not assume that the species I shall recommend in the following notes will lack appeal and will not yield a high measure of interest. Without denigrating the more colourful aquarium fishes, I must make the point that their attractions are fairly obvious, and that you don't have to look very deeply for them. In the case of the foil fishes you will find that, over a period, you will begin to add up the good points because you will start to isolate features which you didn't even know were there. You will notice a coloured fin edging which certainly wasn't visible at the shop, and mirror-like reflections which often develop as fish grow give some species dimensions which were not there at the time of purchase.

Somewhat strangely, certain fish with colours in the 'secondary' grouping have developed tendencies which rule them out for the community tank — it is almost as though they have resented Nature's decision to put them in the back row of the chorus, and have decided to rebel. Fin nipping is the worst characteristic, and this is sometimes coupled with a sort of territorial aggressiveness which reduces smaller specimens of other species to terrified skulkers, who take to hiding in the safety of crannies (assuming that you have provided them), where they straightaway begin to miss out when feeding time comes round. The outcome is inevitable. Certain other species are nibblers and uprooters of plant life, and these are just as unwelcome.

I have therefore nominated a number of species whose credentials are unassailable, though I will list also some of those which should be avoided. As in all selections, it should be remembered that individuals can vary so far as temperament is concerned, and the odd one may cause trouble: but this applies to primary as well as secondary categories, anyway.

As I have said, the 'foil fishes' should be kept in smaller quantities, so here is a good opportunity for collectors to widen their experience. The cost should not be great, as many of these species are regarded by the trade as not popular, so that, on the whole, the only expensive species will be those which are rarely imported.

A really tiny fish is the green-eyed rasbora (*Rasbora dorstocellata*), which takes a long time to grow to 1½ inches. It is olive green and silver basically, but it has a brilliantly glowing eye and a dorsal fin with contrasting black and white zones. Thus, if you introduce a handful of these to your collection you will have some interesting movement at the top rear of your tank, as these fish are always on the go. They are one of the most underrated of the small species, and are only gradually coming into their own. Do make sure that the grade of food offered is small enough for them, otherwise they will tend to be overcome by the larger and greedier fish, with which they normally associate without problems. The price seems to have been rising higher by comparison with other species for some months, so possibly its reputation is stabilising.

For a change of shape and size, the winged danio (*Laubuca laubuca*) has a lot to recommend it. This grows to about 3 inches and could be said to be midway between a danio and a hatchetfish. It has very beautiful flowing and extended finnage, and although the general colouring is silvery you will notice blue and gold there, too. It is again an upper-water swimmer, but has not the sometimes irritating exuberance of the danio. On the contrary it is a stately and calculating swimmer, which seems to hover and then suddenly soar through the water when the will prompts it to do so. There is a vagueness about this species which casts it well for a secondary place, but I have yet to be assured of its longevity, as those which I have acquired did not last as well as one might have expected.

The salmon discus (*Ephippicharax orbicularis*), growing to rather less than 3 inches, is one of the best foil fishes I have

ever kept, but is extremely difficult to come by: it is some years since I even saw a specimen. It is silvery throughout, but the dorsal and anal fins have leading edges of black. I sometimes wonder whether I am right in classing this as a secondary species, because when it becomes adult it takes on a stature which just wasn't there before. Its discoid shape certainly makes it look unusual, but what stamps it as a quality fish is its carriage and bearing. It tends to occupy the middle water and gracefully but purposefully patrols the tank without upsetting the other occupants. It has rather large, lovely eyes, which link with the black in the fins to frame the flattish silver body to perfection. It will be expensive even if it is obtainable, but the investment is a good one, as my specimens were quite long-lived. Feeding was no problem at all, as they accepted anything that was going.

To close this part of my selection, I will nominate the bloodfin (*Aphyocharax rubripinnis*) as another ideal background fish. Again, some aquarists will disagree that this lovely species, seldom reaching 2 inches in length, is a foil fish. I suppose it rather depends on the tank conditions and the lighting and the other tenants, but the overall greyish tones offset by the red fins give it a uniformity which sometimes makes it less striking than it ought to be. Unlike some of the other secondary fishes, this is a well-loved species which sells well, and because it shoals naturally an effort should be made to keep it in units of five or above. It is lively and an upper-water swimmer. Perhaps because it is so active it seems to burn itself out rather quickly, and I have not kept specimens for more than a year or so. A giant relative for large tanks is also sometimes available, and the glass bloodfin, which is of an intermediate size, should not be forgotten.

Meetings and Changes of Officers

ABINGDON AS. Chairman, Mr A. Watson; treasurer, Miss D. Compton; secretary/FBAS delegate, Mr D. R. Blundell (23 Welford Gardens, Abingdon, Oxon, OX14 2BN); show secretary, Mr D. Higgs; librarian, Mr J. Humphreys; outings/liaison, Mr P. Carey. Meetings: alternate Thursdays (next meeting 4th March), 8.00 p.m., Barley Mow, Lombard Street, Abingdon.

ASHTON-IN-MAKERFIELD AS. Secretary, Mr S. M. Lloyd (5 Lancaster Avenue, Golborne, nr Warrington,

Lancs.). New venue, Oddfellows Arms, Bryn Cross, alternate Tuesdays, 8.00 p.m.

BEXLEYHEATH & DAS. New Society. Meetings: 2nd & 4th Friday of month, 8.00 p.m., Committee Room, Christchurch, Broadway, Bexleyheath, Kent. Enquiries: Mrs A. E. Greenhalf (149A Broadway, Bexleyheath, Kent; phone 01-304 3386). New members welcome.

BISHOPS CLEEVE AS. Change of name. See under CHELTENHAM TROPICAL FISH CLUB.

BOURNEMOUTH AS. Chairman, Mr J. Jeffery; librarian, Mr P. Brown; PRO, Mr K. S. Gibbs (1290 Christchurch Road, Iford, Bournemouth, BH7 6EA). Meetings: Kinson Community Centre, Millhams Lane, Kinson, Bournemouth.

BRADFORD & DAS. President, Mr K. Avison; vice-president, Mr D. Sugden; secretary, Mr A. Fisher (2 Sherborne Road, Idle, Bradford, West Yorkshire); treasurer, Mr A. Daughley; show secretary, Mr J. Cornforth; publicity officers, Mr L. Galenby and Mr A. Herberts.

BRIGHTON & SOUTHERN AS. Chairman, Mr B. Rice; vice-chairman, Mr J. Smith; secretary, Mr M. Rooney (86 Portland Villas, Hove; phone Brighton

BASINGSTOKE AS have decided to hold a specialist Open Show for Cichlids on 10th July. Cichlidophiles who wish to support this project should contact Mr R. Rich, 93 Pinkerton Road, Basingstoke; phone Basingstoke 27874.

411131); treasurer, Mr T. Martin; show secretary, Mr B. Sayers (11 Seaview Estate, Southwick, BN4 4AS; phone Brighton 692851). Meetings: 1st & 3rd Monday of month, K.T. Club, Franklin Road, Portslade, 8.00 p.m.

BRISTOL AS. New secretary, Mr V. Cole (10 Hardwick Close, Bringtonton, Bristol; phone 711288). Meetings: 2nd Monday of month, 7.30 p.m., Bishopston Parish Hall. Visitors welcome.

CANTERBURY & DAS. New secretary, Mr R. J. Bennett (18 Union Street, Canterbury, Kent, CT1 1LP).

CARDIFF AS. Chairman, Mr R. Batten; vice-chairman, Mr C. Harding; secretary, Mr E. Hurley (35 Spring Gardens Terrace, Cardiff; phone Cardiff 450071); treasurer, Mrs E. Boalch; PRO, Mr R. Davies; show secretary, Mr B. Guy (3 Meadville Road, Cardiff; phone Cardiff 793749).

CHELtenham TROPICAL FISH CLUB (previously Bishops Cleeve AS). Secretary, Mrs J. Bishop (136 Clarence Square, Cheltenham). Change of venue, St Marks Community Centre, Brooklyn Road, St Marks, Cheltenham, 2nd Friday of month.

ERITH & DAS. New secretary, Mr X. J. Bowman (442 Hurst Road, Bexley, Kent, DA5 3JR).

FANCY GUPPY ASSOCIATION, NORTH WEST LANC'S SECTION. Chairman, Mr J. Hutchings; secretary, Mrs J. Ego (3 The Dell, Fulwood, Preston, PR2 3FX); treasurer, Mr D. Matthews; show secretary, Mr D. Ormerod.

HEMEL HEMPSTEAD AS. New venue, The Rose & Crown Hall, High Street, Hemel Hempstead, Herts, every other Thursday, 7.45 p.m.

HULL AS. President, Mr R. Willerton; vice-president, Mr J. Ballard; chairman, Mr T. Douglas; vice-chairman, Mr A.

Douglas; secretary, Mr M. Leason; show secretary, Mr G. Andrews; assistant secretary, Mr J. Stabler; treasurer, Mr G. Batch; librarian, Mr A. Frisby; PRO, Mr A. Frisby (13 Braemar Avenue, Endpike Lane, Hull; phone Hull 854889). Meetings: 1st & 3rd Wednesday, B.R. & Dockers Club, Anlaby Road, Hull.

KINGSCLEERE & DAS. President, Mr J. Perry; chairman, Mr R. Onslow; secretary, Mr E. Mousley (11 Knowle Crescent, Kingsclere; phone Kingsclere 298748); treasurer, Mr M. Shore; table show secretary, Mr A. Stepp; shop manager, Mr M. Shore; FBAS delegate, Mr R. Onslow. Meetings: alternate Tuesdays, 8.00 p.m., The Crown, Kingsclere, Newbury, Berkshire.

LEICESTER AS. President and treasurer, Mr B. Peel; vice-president, Mr E. Calver; chairman, Mr J. H. Williams; secretary, Mr B. Mrs R. Martin (2 Avondale Road, Wigston Fields, Leicester); show secretary, Mr M. Whitham (5 Grantham Road, Leicester).

MID-SUSSEX AS. Chairman, Mr Johnson; vice-chairman, Mr R. Short; secretary, Mr B. Slade (Sandown, Bolney Road, Anstye, Haywards Heath, Sussex; phone Haywards Heath 537471); treasurer, Mr R. Young; show secretary, Mr B. Burtles.

NEW FOREST AS. Secretary, Mr R. Travers (16 Auckland Avenue, Brockenhurst, Hampshire, SO4 7RS). Meetings: 3rd Monday of month, 7.45 p.m. Visitors and new members welcome.

OLDHAM & DAS. Change of venue, Federation of Ukrainians in Great Britain, 96 Waterloo Street, Oldham; alternate Mondays at 8.00 p.m. Show secretary, Mr A. Chadwick (341 Broadway, Chadderton, Oldham; phone 061-852 0809). Membership: Mr E. Birchwood (14 Hill Top, Healds Green, Chadderton; phone 061-833 2908).

RIVERSIDE AS. Chairman, Mr J. Nethersell; treasurer, Mr W. Nethersell; show secretary, Mr G. Biggs; assistant show secretary, Mr D. Lambourne; secretary, Mrs M. Nethersell (13 Greyhound Road, Hammersmith, London, W.6.); P.R.O., Mr M. Goss; social assistant, Mr R. Newman.

RUNNYMEDE AS. Chairman, Mr H. Nicholls; secretary, Mr P. Cairn (11 Muncaster Road, Ashford, Middlesex; phone 59230); treasurer, Mr J. Shepherd; show secretary, Mr T. Butler; social secretary, Mr P. Grosvenor; P.R.O., Mr L. Duke.

SLOUGH & DAS. Chairman, Mr R. Knight; vice-chairman, Mr M. Colgate; secretary, Mrs E. Knight (52 Aldin

Avenue South, Slough); treasurer, Mr B. Withers. Meetings: next meeting 17th March, Friends Meeting House, Ragstone Road, Slough.

SUDBURY AS. Change of address. Show secretary, Mr L. J. Brazier (65 Ormsby Way, Kenton, Middx; phone 01-204 5374).

TAUNTON & DAS. Chairman, Mr S. Pearcy; vice-chairman, Mr O'Neill; secretary, Mr D. Curry (Flat 1, The Square, Wiveliscombe, Taunton, Somerset); treasurer, Mr E. Pellant; trophy B show secretary, Mr M. Tran; PRO, Mr R. Hagley; social secretary, Mr M. Bray; club judge and show manager, Mr S. Pearcy.

TORBAY AS. Chairman, Mr F. Orsman; vice-chairman, Mr G. Thompson; treasurer, Mr J. Corner; acting secretary, Mr J. Denning (297 Teignmouth Road, St Marychurch, Torquay, TQ1 4RT; phone 384041); show secretary, Mrs J. Griffiths (Lydwell Cottage, Hillhead, Brixham; assistant, Mr D. Mayo; editor, Mr M. Matthews; assistant, Mr J. Denning. Meetings: alternate Tuesdays from 13th January, 8.00 p.m., St. Andrews Methodist Church School Hall, Torridge Avenue, Shiphay, Torquay.

TOTTENHAM & DAS. New show secretary, Mr C. James (7 Stockton Gardens, London, N.17).

WALTHAMSTOW & DAS. Chairman, Mr D. Goodbody; vice-chairman, Mr A. Wiegold; secretary, Mr G. Smith (22 Ardleigh Road, Walthamstow, London, E.17); treasurer, Mr A. Chandler; show secretary, Mrs T. Twine. Meetings: first Friday, third Wednesday of month, 8.00 p.m., Grange Community Centre, Frederick Street, Walthamstow, London, E.17. New members always welcome.

WEYMOUTH AS. Chairman, Mr J. Fitzgerald; vice-chairman, Mr J. Fancy; secretary, Mr P. J. Hardy (485 Radipole Lane, Weymouth, Dorset); treasurer, Mrs J. Hardy.

A PLEA—will the holders of trophies won at the last INDEPENDENT AS Open Show held at Islington Town Hall please return them to Mr R. Bowes, 145 Sansom Road, Leytonstone, London, E.11. Postage will be refunded.



TORBAY AS has been producing some tape/slide programmes, with slides and commentary by Mr Noel Gray. It is expected that 'Dangerous Marine Fish' will be a programme for hire in April at £3.00 to FBAS-affiliated societies. The recording is on 5½ in. spools — 3½ in. per second, and the Society queries whether there is a

demand for cassette recordings? Enquiries (with s.a.e. please) and comments to chairman, Mr F. Orsman, 75 Home Park, Ashburton, Devon. The Society's programme for 1976 includes a talk by Mr Lewis Doubleday (BMAA, 2nd March) and four FBAS tape/slide shows on 30th March ('Northern Sights' by Mr Bob Esson), 27th April ('Aquarian' by Dr D. Ford), 25th May ('International Aquaria' by Dr D. Ford), 22nd June ('Angels' by Mr R. C. Mills). Prospective new members might like to attend Society meetings at 8.00 p.m. on alternate Tuesdays (from 13th January 1976) at the St Andrews Methodist Church

School Hall, Torridge Avenue, Shiphay, Torquay.

FIFTEEN fishes were entered in the **WELWYN GARDEN CITY AS** 'Fish of the Year' competition. It was judged by Mr Sweetman and assistant and first and second places were awarded to treasurer Mr P. Sweet for a male and a female *Pseudotropheus tropheus*. Third place went to a congo tetra owned by Mr D. McCrystal. At this meeting, while the judging was taking place, Mr D. Fitts gave members a talk on keeping gouramies, followed by Mr Bill Day describing how fishkeeping developed in his home.

RIVERSIDE AS organised an outing for children of members to see 'Dick Whittington on Ice', at the end of the year. One week later it was the turn of the parents to enjoy themselves at a club evening. Free drinks and food were provided by the FBAS and the club to entertain members. Mr F. Tomkins, chairman of the FBAS, said 'thank you' to all those who helped at The Aquarium Show '75. Mr R. Esson, president of the club, presented members with the annual awards and a laugh a second was enjoyed by the guests at a showing of some hundred slides of themselves, all taken by Mr Esson and Mr J. Nethersell, when they were seen by the camera in 'compromising' situations.

AT both the January meetings held by **BASINGSTOKE AS** in January the subject was judging. At the first, Mr C. A. T. Brown, through the medium of an FBAS tape and slide lecture, gave tips on this and then at the second meeting Mr Maurice Carter of Bracknell AS gave a talk and discussed the techniques of judging. During the meeting most members were able to judge some selected fish in a competition and when the results were compared with those of the speaker, Mr R. Hollings had the first four in correct order and a close second was Mr John Jackson. The standard was high, and two juniors, Anthony Marshall and Shaun Hannah, did particularly well.

MEMBERS of KINGSCLERE & DAS (FBAS) were given a detailed talk on showing fish by Mr R. Onslow at their two January meetings. Table show results were: Class M: 1 (joint), Mr M. Shore, Mr E. Mouldsley; 3, Mr E. Mouldsley. Class D: 1, Mr A. Lawson; 2, Mr E. Mouldsley; 3 & 4, Mr W. Cornick. At one of the meetings a library was formed and members were at once able to make good use of the large number of books received. A trip to various tropical fish shops was also



FEDERATION NEWS

THE first winner of the Bronze Brooch in the Federation's Brooch Scheme is Mr Mervyn Strange of Basingstoke AS, and the presentation was made to him at the Federation's AGM. At this meeting Mr C. A. T. Brown was elected vice-chairman and Mr H. Parrish the general secretary.

A speaker added to the List of Speakers is Mr I. Sellick, 88 Kings Drive, Bishopston, Bristol, BS7 8JH, and his subject is 'Fish Colouration and Communication' with slides. Mr R. J. Canning of Cold Ash, Newbury, Berks., has been made a C Class tropical judge.

The Federation Council has decided to stage a series of Conventions to give an opportunity for experts talking on their own particular field of aquatic interest to be heard. The first one will be on 11th September in the Meeting Room of the Zoological Society, London, in the afternoon and early evening.

arranged, with the use of a mini-bus donated by one of the members for the trip. Prospective new members who would like to take part in such activities are very welcome to attend meetings, which are held on alternate Tuesdays at 8.00 p.m. in The Crown, Kingsclere, and a special welcome is extended to such visitors to attend the meeting on 9th March when the FBAS AquaTalk no. 6 will be shown.

AT the January meeting of the **GOLDFISH SOCIETY OF GREAT BRITAIN**, Mr Dave Easingwood gave a slide show and lecture on the way he set about constructing a fish house. The slides showed the construction, stage by stage, starting from a bare patch of ground to the finished building. Every detail of the costs was itemised and valuable advice given on the building laws. Mr Easingwood's fish house is a modified large glass house. To overcome the problem of 'green water', and to keep in line with modern thinking — that goldfish kept in

a fish house in aquariums require a continuous supply of fresh water — a continuous water supply to each aquarium was installed during the erection of the building. Plastic piping was used and each tank given a valve above to control the water flow. The overflow from each aquarium flows into a drain. Questions asked reflected the amount of interest shown in the subject of fish houses and their building, and the audience also enjoyed seeing slides showing fish keepers in the Midlands.

THE BRIGHTON & SOUTHERN AS annual prize-giving, held on the same evening as their AGM, was of special interest for a comparative newcomer to the Society, Mr T. Ramshaw, who, in his first year of showing fish, was awarded four trophies. Other successful members include Mr B. Sayers (three trophies), Mr & Mrs Houghton (whose four trophies included the 'Fish of the Year' award) and Master M. Stapleton, who won the Junior Cup. Other trophy winners were Miss K.

Sayers, Mr B. Shanklin, Mr & Mrs Rooney, Mr R. Cannon, D. Mann, Mr G. Clarke and Mr & Mrs Feek. The Member of the Year award was given to Mrs L. Mann in appreciation of all her hard work throughout the year.

MR C. Turner of Cardiff won the Best Fish in Show award at the **BISHOPS CLEEVE AS** Open Show with a whiptail catfish. There were 356 entries and Mr R. Lawrence of Bristol won the Best Coldwater award.

Guppy, male: 1, Mr J. Ferguson; 2, Mr D. W. Parry; 3, Mr D. Curtis. Guppy, female: 1, Mr G. V. Ludlow; 2, D. & R. Clark; 3, Mr D. Curtis. Platys: 1, Mr C. Turner; 2, Mrs K. Martin; 3, Mr D. Curtis. Swordtails:

1 & 2, Mr P. J. Greenwood; 3, Mr G. W. Roon. Mollies (velifera & latipinna): 1, Mr J. Douglas; 2, Mr J. Ferguson; 3, Mr B. Holder. Mollies (aov): 1, Mrs J. Hawkins; 2, Mr C. Jackson; 3, Mr T. Taylor. Barbs under 3": 1 & 2, Mr & Mrs K. Hodges; 3, Mr F. Timmins. Barbs over 3": 1, Mr D. Wing; 2, Mr M. Bish; 3, Mr F. Edwards. Danios, minnows: 1, Mr M. Strange; 2, Mr C. Turner; 3, Mr B. Davies. Rasboras: 1, Mr C. Turner; 2 & 3, D. & R. Clark. Botias, loaches, sharks, foxes: 1, Mr F. Timmins; 2, Mr D. Parry; 3, Mr H. Chick. Hyphessobrycon, etc.: 1, Mr H. Chick; 2, Mr C. Turner; 3, Mr J. Douglas. Nannostomus & Poecilibrycon: 1, Mr Strange; 2, Mr T. Taylor; 3, Mr B. R. Goll. aov Characins: 1, D. & R. Clark; 2 & 3, Mr C. Turner. Dwarf cichlids: 1, Mr F. Timmins; 2, Mr R. Towler; 3, Mr P. J. Greenwood. Large cichlids aov: 1, J. W. F. Hughes; 2, Mr J. V. Walton; 3, Mr P. Tannar. Angels: 1, Mr T. Taylor; 2, Mr M. Rogers; 3, Mr M. Durbin. Siamese fighters: 1, Mr B. Tooze; 2, Mr J. Shapcott; 3, Mr D. Curtis. Anabantids aov: 1, Mr F.

Timmins; 2, D. & R. Clark; 3, Mark Freshney.

Corydoras & Brochis: 1 & 3, Mr P. J. Greenwood; 2, Mr T. Taylor. Catfish aov: 1 & 2, Mr C. Turner; 3, Mr K. R. Baker. aov Livebearers: 1, Mr & Mrs K. Hodges; 2, Mr N. Wing; 3, Mr M. Bishop. aov Egglayer: 1, Mr Lawrence; 2, Mr J. Ferguson; 3, Mr J. Douglas. Killifish: 1, Mr F. Timmins; 2, Mr B. Tooze; 3, Mr R. A. Poots. Sexed pairs, livebearers: 1, Mr R. A. Poots; 2, Mr Whitaker; 3, Mr D. F. C. Kenwood. Sexed pairs, egg-layers: 1, Mr R. A. Poots; 2, Mr S. Jones; 3, Mrs Timmins. Breeders livebearers, team of 4: 1, Mr M. Bishop; 2, Mr C. Turner; 3, Mr Lawrence. Breeders egg-layers, team of 4: 1, Mr C. Turner; 2, Mr B. Tooze; 3, Mr M. Strange.

Junior, av fish: 1, Master S. Owen; 2, Mark Freshney; 3, O. Small. Shubunkins: 1, Mr M. Bishop; 2, Mr C. Giles. Single & twin-tailed goldfish: 1, Mr M. Rodgers; 2, Mr M. Bishop; 3, Mr B. R. Goll. aov Pond or River Fish: 1, Mr Lawrence; 2, Mr B. R. Goll; 3, Mr M. Bishop. av Marine: 1, 2, 3, Mr W. Martin.

Three Counties Twenty-first

THE THREE COUNTIES GROUP 21st Open Show held at Reading University was supported by a total of 163 competitors from 40 societies, with most entries coming from the south, the west country and South Wales. Exhibits totalled 828 and were judged by 15 FBAS judges. Mr D. Ellis of Kingston and Mr G. Churchill from Bristol judged the eight-class killie section which, with a total of 44 exhibits was not the success hoped for. The coldwater classes were well supported with 82 exhibits and these were judged by Mr R. Esson, the Les Jordan trophy for best coldwater fish being won by Mr J. Jude of Gosport AS. There was a total of 160 tropical livebearers on show and the Rundle Rosebowl for Best Livebearer was won by Mr L. Littleton of Bristol TFC. The Bracknell trophy for Best Tropical Egglayer was won by Mr W. Knight of Gosport AS and he also won the High Wycombe Carved Trophy and the Gold pin for the Best Fish in Show with the same exhibit. The Basingstoke Cup for Highest Pointed Society was won by Sudbury AS who beat Gosport by one point. The Ladies Rosebowl was won by Mr P. Newbury of Gosport AS.

Killies, Fb: 1, Mr D. Jackson (Salisbury); 2, Mr D. Langford (Haselmere); 3, Mr C. Morrison (P. Talbot). Fc: 1 & 2, Mrs O. Lay (BKA); 3, Mr B.

Tooze (Bristol T.F.C.): Fc: 1 & 2, Mr V. Green (BKA); 3, Mr F. Timmins (Gloucester). Ff: 1, Mr V. Green. Fg: 1, Mr J. Jackson (Basingstoke); 2, Mr P. Brown (Shampton); 3, Mr J. Jude (Gosport). Nf: 1, Mr A. Weaire (Shampton); 2 & 3, Mr P. Merritt (Reading). Xf: 1, Mr K. Hillier (Newbury); 2, Mr V. Green; 3, Mr J. Jackson. The Best Killie trophy and the FBAS Championship trophy were won by Mrs O. Lay from Newton Abbot, Devon.

Ag: 1 & 3, Mr K. Lewis (Riverside); 2, Mrs K. Lewis. Ba: 1, Mr A. Chaplin (Basingstoke); 2, Mr R. Canning (Newbury); 3, R. B. L. Hills (Aylesbury). Bz: 1, Mr A. Blake (Basingstoke); 2, Mr L. Brazier (Sudbury); 3, Mr T. Burville (Bas.). Ca: 1, Mr P. Moye (Sudbury); 2, Mr R. Onslow (Kingsclere); 3, Mr B. Saunders. Cb: 1, Mr G. Lucas (Sudbury); 2, Mr L. Brazier (Sudbury); 3, Mr R. Cripps (Newbury). Cr: 1, Mr A. Weaire; 2, Mr B. Sayers (Brighton); 3, Mr R. Leslie (H. Wycombe). Da: 1, Mr R. Canning; 2, Mr P. Newbury; 3, Mr Wans (Banbury). Db: 1, Mr P. Newbury; 2, Mr T. Fraser (Bas.); 3, Mr G. Best (Swansea). Dc: 1, Mr W. Knight (Gosport); 2, Mr K. Connolly (Gosport); 3, Mr & Mrs Houghton (Brighton). Dd: 1, Mr R. Canning; 2, Mr R. Adams (Salisbury); 3, Mr P. Brown. Ea: 1 & 3, Mr A. Thacker (Vauxhall); 2, Mr B. Tooze (Bristol). Eb: 1, Mr G. Best (Swansea); 2, Mr R. Canning; 3, Mr J. Jackson (Bas.). Ee: 1, Mr P. Brown; 2, Mr T. Ramshaw (Brighton); 3, Mr J. Bushby (H. Wycombe). G: 1, Mr D. Sheridan (Newbury); 2, Mr P. Moye; 3, Mr R. Canning. H: 1 & 3, Mr G. Best; 2, Mr P. Moye. H: 1, Mrs I. Clarke (Gosport). J: 1, Mr B. Saunders; 2, Mr A. Chaplin (Bas.); 3, Mr T. Ramshaw (Brighton). K: 1, Mr P. Moye; 2, Mr J. Ferguson (Bath); 3, Mr T. Fraser. L: 1, Mr A. Tull (Salisbury); 2, Mr K. Hillier (Newbury); 3, Mr A. Brooker (Aylesbury). Ma: 1 & 3, Mr F. Timmins; 2, Mr K. Collony (Gosport). M: 1, Mr G. Eggs (Riverside); 2, Mr J. Ferguson; 3, Mr L. Brazier.

O: 1, P. B. L. Hills; 2 & 3, Mr M. Collins (Brighton). P: 1, Mr A. Onslow (Loughborough); 2, Mr B. Davies (Rhonda); 3, Mr I. Peirce

Davies (Rhonda); 3, Mr G. Lucas. Q: 1, Mr T. Burvill (Bas.); 2, Mr A. M. Smith (Rhonda); 3, Mr I. Peirce (High Wycombe). R: 1 & 2, Mr L. Littleton; 3, Mr R. Onslow. S: 1, Mr B. Ashcroft (Rhonda); 2, Mr P. Moye; 3, Mr R. Dobson (Coswold). T: 1, Mr K. Usher; 2, Mr A. Chaplin (Bas.); 3, Mr T. Burville (Bas.). MB-M: 1, Mr A. Rigby (Gosport); 2, Mr A. Chaplin; 3, Mr A. Blake. NO-T: 1, Mr E. Penhurst (Bracknell); 2, Mr A. Weaire; 3, Mr C. Turner.

Uad: 1 & 3, Mr R. Cowley (Gosport); 3, Mr E. Binstead (Portsmouth). Ub: 1, Mr R. Hard; 2, Mr A. Marshall; 3, Mr F. Pinder. Uc: 1, 2 & 3, Mr L. Roberts (GSGB). Vb: 1, Mr A. Marshall; 2, Mr L. Roberts; 3, Mr D. Jackson. V: 1, Mr A. Marshall; 2 & 3, Green & Rudland (Reading). aov: 1, Mr J. Jude; 2, Mr D. Stoke (Havant); 3, Mr E. Binstead (Portsmouth). XU-W: 1 & 2, Mr F. Pinder; 3, Mr B. Webb (Bath). XB-M: 1 & 3, Mr P. Moye; 2, Mr P. Newbury. XO-S: 1, Mr I. Pierce (H. Wycombe); 2, Mr Hillier (Newbury); 3, Mr A. Gibson (Reading). XT: 1, Mr M. Bishop (Bishops Cleeve); 2, Mr C. Morrison (P. Talbot); 3, Mr M. Bishop. Ya: 1 & 2, Mr A. Hamsworth (Bas.). Zs: 1, Mr M. Butcher (Trowbridge); 2, Mr T. Duffy (Bracknell); 3, Mr A. Weaire. Zb: 1, Mr P. Merritt (Reading); 2, Mr J. Jude; 3, Mr R. Shirley (Haselmere). Zc: 1, Mr D. Stokes; 2, Mr D. Langford (Haselmere). Novelty snails: 1, Mr M. Patrick; 2, Mr D. Eldridge; 3, Mr E. Binstead.

Anthony Marshall (Basingstoke) won the Newbury Cup, the Group's closed trophy for the Junior with most points. Ivan Pierce (High Wycombe) won the Group's breeding achievement trophy. Mr R. Canning (Newbury) won the highest pointed competitor's shield and Basingstoke won the Cup for highest pointed society. The Show was visited by a large number of people from as wide an area as those that competed, including a coach from South Shields AS whose members spent the weekend with their 'twinned' society, Basingstoke AS. The member societies of the Group are well pleased with the result of the Show which was something of an experiment and the only regret was that the weather was somewhat unkind, making travelling a discomfort for competitors, judges and visitors.

In Brief...

... AT the first **KINGSCLERE & DAS** AGM, held in the Coffee Room of the Crown recently, members expressed sincere appreciation for the efforts of the officers during the society's first year. Mr A. Stepp won the table show. An open invitation is extended to all prospective members and visitors to attend any future meetings, held at the Crown, Kingsclere, every other Tuesday at 8.00 p.m.

... **BEXLEYHEATH & DAS** meetings are held on the 2nd and 4th Friday of each month, 8.00 p.m. at the Committee Room, Christchurch, Broadway, Bexleyheath, Kent. Enquiries to Mrs A. E. Greenhalf, 149a Broadway, Bexleyheath, Kent; phone 01-304 3396.

... **HYDE AS** announce with pleasure that at their forthcoming Open Show on Easter Sunday (18th April) fees remain the same while prizes are up. Eight FNAS judges will officiate at the Hattersley Community Centre, Hattersley Road East, Hattersley, Hyde, Cheshire (see Dates for Your Diary).

... **BOURNEMOUTH AS** have happily found themselves in a very good financial position, it

YATE & DAS are not happy to have to announce that their Open Show on 10th April has had to be postponed owing to the unforeseen high cost at the arranged venue. Alternative accommodation is being sought and the Society hope to arrange the show for September. Members hope that they have not inconvenienced friends and supporters and look forward to welcoming them at their 10th Open Show later in the year. The new date and details will be given in a later issue.

was reported at their AGM. The Society's new chairman is Mr J. Jeffery. A vote of thanks was recorded to Mr Walker as ex-chairman and to the previous committee members. Mr Bebb won in the table show for platys.

... AT a well-attended AGM, Mr S. Lloyd was again elected president of **BRISTOL AS**, Mr C. Lloyd was elected treasurer and Mr V. Cole (10 Hardwick Close, Brislington, Bristol; phone 711286) was elected secretary. A question and answer session revealed that angels, neons, swordtails and catfish were probably the most popular tropical fish.

... **ABINGDON AS** hold their meetings on alternate Thursdays (next meeting, 4th March) in the Barley Mow, Lombard Street, Abingdon, from 8.00 p.m. Forthcoming attractions will consist of a series of FBAS Tape / Slide Lectures, table shows, auctions etc. and there is always much friendly advice available to help newcomers and experienced aquarists alike.

... A GOOD attendance at the January meeting of **STROUD & DAS** heard guest speaker Mr Bishop, a judge from the Severnside AA, give a talk and display on setting up a show furnished aquarium and demonstrating the best tank size and plants, gravel and rocks to use. The challenge for cichlids was won by Mr T. Owen.

... THIS year the **CHINGFORD & DAS** Open Show (24th April) commemorates the Society's 25th Anniversary and they are hoping for good support. Schedules are obtainable from Mrs S. Harvey (54 Kenilworth Avenue, Walthamstow, London, E17 4PE) from the beginning of this month.

... OWING to a very encouraging increase in membership, **OLDHAM & DAS** have had to find larger premises. Meetings are now held every other Monday at 8.00 p.m. at the Federation of Ukrainians in Great Britain, 96 Waterloo Street, Old-

THE THREE COUNTIES GROUP of societies has decided not to hold an Open Show during 1976. An increase of 300% in venue costs to over £300 has made it necessary to look for alternative, suitable premises; therefore it is now proposed to delay staging a show until the 3rd April 1977.

ham, where old and new members will find a very warm welcome. Forthcoming attractions include lectures on water-testing, angels, mini-jars, slide shows on Marine Life, Portrait of a Guppy, Cichlids, Gems in the Rough, plus the usual monthly table shows. Further information: Mr. E. Birchwood, 4 Hill Top, Healds Green, Chadderton; phone 061-633 2908.

... **THE MID-SUSSEX AS** AGM found the Society in good financial standing. Particular praise was given by the out-going vice-chairman, Mr D. Soper, to members for the hard work put in at the Fish Exhibition in May. The high standard of fish shown was commented on by Mr J. Burtles, the retiring show secretary.

... THE January meeting of **NEW FOREST AS** (affiliated to the FBAS) was very well attended. Members met at the Symington Community Centre to view a colour-slide lecture on Practical Aquarium Maintenance by Mr C. Harrison, produced by the FBAS. It was of good quality and all members, even beginners, felt they had learned much about how to fit and service their own aquarium equipment. Mr M. Aust won in the table show. Meetings are held on the 3rd Monday of the month at 7.45 p.m. Visitors and new members are most welcome.

... **CANTERBURY & DAS** were quick to respond to the letter from Master Franks of Whitstable, Kent (PFM, November, 1975) in which he mentioned that he was 8 miles from his nearest society and couldn't get

to meetings. The Society contacted Master Franks and provided transport so he can become an active member of their group. That's really making a new member feel welcome.

HASTINGS & ST LEONARDS AS report that in January Mr Barry Funnell gave them one of his excellent slide lectures on livebearers, full of useful information. The Society's annual auction was held and a general re-shuffle of fish and equipment took place during the evening.

... A CHANGE of name is an-

nounced: Bishops Cleeve AS is now the **CHELTENHAM TROPICAL FISH CLUB**. There has also been a change of venue and meetings are now held at St Marks Community Centre, Brooklyn Road, St Marks, Cheltenham (2nd Friday of month).

THE BRITISH KOI-KEEPERS' SOCIETY is now distributing a new style monthly bulletin to members, sporting an eye-catching new cover and plenty of hints on koi-keeping inside. Membership secretary is Mr D. C. Davis, 137 Gayfield Avenue, Brierley Hill, West Midlands DY5 2BX.

Dates for Your Diary

6th March, **FBAS** General Assembly, 2.00 p.m., Conway Hall, Red Lion Square, Holborn, London, WC1.

14th March, **BRITISH KOI-KEEPERS' SOCIETY** Seminar, Post House, Leicester, 11 a.m., Films and Lectures. Entry by programme only (50p, children free). Obtainable on door or from Mr M. Waumsley, 165 Woodside Road, Amersham, Bucks. HP6 6NR.

14th March, **DON VALLEY AS** Open Show, Staff Dining Rooms, British Steel Corporation, Stocksbridge, Sheffield. Details: Mr C. Broomhead, 5 Broomfield Road, Stocksbridge, Sheffield.

20th March, **RIVERSIDE AS** Open Show, St. Saviour's Church Hall, Cobbold Road, Acton. Schedules: Mr D. Lambourne, 7 Wheeler Court, Plough Road, London, SW11 01-223 2630.

20th March, **GOLDFISH SOCIETY OF GREAT BRITAIN** Annual General Meeting, 2.0 p.m., Conway Hall, Red Lion Square, Holborn, London, WC1.

21st March, **FNAS** Annual General Meeting, Lake Hotel, Belle Vue, Manchester (please note venue).

27th March, **HENDON & DAS** 17th Annual Convention, Whitfields Secondary Modern School, Claremont Road, Hendon, London, N.W.2. Speaker: Professor B. Conde. Tickets: Mr H. White, 52 Ellesmere Avenue, Mill Hill, London, NW7; phone 01-959 5329.

30th March, **TTAA THREE RIVERS' CHAMPIONSHIP**. (And Dinner Dance). Lantton Lion Park, Chester-le-Street, 8.00 p.m., Details: Mr F. K. Askew, 50 James Armitage Street, Southwick, Sunderland, Tyne-Wear, SR5 2SR.

3rd April, **CORRINGHAM & DAS** Open Show, Red Cross Hall, Corringham Road, Stanford-le-Hope, Essex. Schedules (March): Mr D. C. North, 198 Southend Road, Stanford-le-Hope (773111).

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. Savours 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 see please): Mr T. Emma, 79 Edward Road, Coventry CV6 2QS.

18th April, **HYDE AS** Open Show (Easter Sunday), Hattersley Community Centre, Hattersley Road, East, Hattersley, Hyde, Cheshire. Schedules (FNAS Rules): Mr G. L. Danby, 1 Danistop Road, Heaton Moor, Stockport, Cheshire; 061-432 8817.

24th April, **CHINGFORD & DAS** Open Show, Schedules: Mrs S. Harvey, 64 Kenilworth Avenue, Walthamstow, London, E17 4PE.

24th April, **BRISTOL TFC** Open Show, Congregational Church Hall, Newton Street, Stapleton Road, Bristol. Tropical and coldwater classes. Schedules: Mrs M. C. Graham, 24 Romney Avenue, Lockleaze, Bristol BS7 9TW (Bristol 695898).

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

25th April, **WARRINGTON AS** Open Show, Farr Hall, Palmira Square, Warrington. Schedules (FNAS Rules): Mr J. Higham, 42 Hood Lane, Sankey, Warrington, WA5 1EJ; phone 36939.

25th April, **YORK & DAS** Open Show, Melbourne Youth Club, Fishergate, York. Schedules: Mr A. Sykes, 99 London Street, Pocklington, York, YO4 2JW.

2nd May, **BRISTOL AS** Tropical Open Show, Bishopsston Parish Hall.

2nd May, **HULL AS** Open Show, The Blind Institute, Beverley Road, Hull. Schedules: Mr G. Andrews, 4 Church Mount, Sprotby, nr. Hull, N. Humberside (phone 0482 811334).

8th May, **PORT TALBOT AS** Open Show, Talbach County Youth Centre, Margam Road, Port Talbot. Schedules:

Mr A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, West Glamorgan, SA13 1AZ.

8th May, **SOUTHEND, LEIGH & DAS** Open Show, St Clements Hall, Leigh-on-Sea, Essex. Club & Individual furnished, aquascapes, minives, tropical, coldwater and junior classes. Details: Mr D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea, Essex; 0702 810578.

9th May, **THORNE AS** Open Show, Grammar School, St. Nicholas Road, Thorne. Schedules: Mr E. Breakwell, 12 Churchill Avenue, Cemetery Road, Hatfield, nr. Doncaster; phone Doncaster 840546.

16th May, **GOSPORT & DAS** Open Show, Crofton Community Centre, Stubbington, Hampshire. Schedules: Mrs K. Clarke, 36 Cambridge Road, Lee-on-Solent, Hampshire.

16th May, **MERSEYSIDE AS** Open Table Show, Rainhill Village Hall, Rainhill, Lancashire. Details: Mr J. Bailey, 11 Auburn Road, Liverpool, L1V3 8BJ; phone 051-228 8199.

16th May, **GLOUCESTER AS** Open Show, Details: Mr C. Freshney, 81 Ferry Orchard, Upton St. Leonards, Gloucester.

22nd May, **MERTHYR AS** Open Show (CNAF/FBAS), St. Davids Hall, Church Street, Merthyr Tydfil, Glam., S. Wales. Schedules: Mr P. R. Stonehewer, 22 Vernon Close, Penyard, Merthyr Tydfil, Glam., S. Wales.

23rd May, **LINCOLN & DAS** Open Show, Drill Hall, Broadgate, Lincoln. Schedules: Mr D. Driver, 6 Hawthorn Chase, Bunkers Hill, Lincoln.

23rd May, **HAVANT & DAS** Open Show, The Merchiston Hall, Hornsea, Hants. Schedules: Mr H. Armistead, 74 Park House Farm Way, Leigh Park, Havant, Hants; phone Havant 73192.

30th May, **CHELTENHAM TFC** (formerly Bishops Cleeve) Open Show, St Marks Community Centre, Brooklyn Road, Cheltenham. Schedules: Mrs J. Hawkins, 44 Burton Street, Cheltenham.

30th May, **BRIDLINGTON & DAS** Open Show, Hildrithorpe Junior School, Shaftesbury Road, Bridlington, N. Humberside. Schedules (March): Mr P. Robson, 47 Matson Road, West Hill Estate, Bridlington, N. Humberside, YO16 4SZ.

30th May, **CORBY & DAS** Open Show (FBAS Rules), Corby Civic Centre, Schedules: Mr C. McInnes, 18 Westminster Walk, Corby, Northants, NN18 9JA.

5th June, **WESTON-SUPER-MARE TFC** Open Show, St John's House, Oxford Street, Weston-super-Mare. Schedules: Mr M. E. Tanner, 6 Byron Road, Locking, nr. Weston-super-Mare.

5th June, **FBAS** General Assembly, 2.00 p.m., Conway Hall, Red Lion Square, Holborn, London, WC1.

6th June, **ACCINGTON & DAS** Open Show, Antley Methodist Church Hall, Blackburn Road, Accrington. Schedules: Mr S. Walsh, 133 Lam-mack Road, Blackburn, Lancs., BB1 8LA.

6th June, **LOUGHBOROUGH & DAS** Open Show, Bureleigh Community Centre, Thorpe Hill, Loughborough. Schedules: Mr I. S. Purdy, 10 Cleveland Road, Loughborough, Leics.

6th June, **SUDBURY AS** Open Show, Wasps Rugby Club (new venue), Repton Avenue, Sudbury. Schedules: Mr L. J. Brazier, 66 Ormsby Way, Kenton, Middlesex; 01-204 8374.

12th June, **LLANTWIT MAJOR AS** Open Show, Town Hall, Llantwit Major (FBAS Rules). Superior plaques to

every class winner, medallions to runners up. Schedules (April): Mr J. J. Edwards, Glanaton, Mill Park, Llanbithlian, Cowbridge, Glam, CF7 7BG.

13th June. **HINCKLEY & DAS** Open Show. Westfield Community Centre, Rosemary Way (off Coventry Road A47), Hinckley, Benching 11.30 a.m. - 2.00 p.m. Schedules: Mr E. Baxter.

13th June. **SALISBURY & DAS** Open Show. Activity Centre, Wilton Road, Salisbury. Schedules (FBAS Rules): Mr R. F. Adams, 28 Empire Road, Salisbury, Wilts, SP2 9DF.

20th June. First **REDDITCH OPEN AQUATIC SHOW** organised by Denson AS, Abbey Sports Stadium, Birmingham Road, Redditch, Worcs. Details: Mr P. J. Binsley, 25 Flyford Close, Lodge Park, Redditch, Worcs; phone Redditch 67342 evenings.

29 Northfield Road, Hinckley, Leics.

20th June. **ALFRETON & DAS** Open Show. Adult Education Centre, Alfreton Hall, Alfreton. Schedules: Mr K. Dean, 22 Fitchers Row, Nottingham Road, Ripley, Derby, NE5 3BA (phone: Ripley 3302).

20th June. **SWILLINGTON AS** Open Show. John Smeaton School, Barwick Road (off York Road), Leeds 15. Benching 12.30 - 2.15 p.m. Details: Mr T. Seaman, 24 Raincliffe Road, Leeds 8, SL9 9LR.

20th June. **SOUTH SHIELDS AS** Open Show. Bolingbroke Hall, Bolingbroke Street, South Shields. Schedules (April): Mr B. Risbridger, 13 Cheesterton Road, Biddick Hall Estate, South Shields, Tyne & Wear, NE34 9TW.

27th June 1976. **BOSTON AS** Open Show. Details later.

27th June. **DUNLOP AKS** Open Show. Dunlop Factory, Speke, Liverpool. Benching noon - 2.0 p.m. Schedules: Mr T. Hampton, 3 Madeline Street, Liverpool 8 (phone: 051 709 5509).

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

4th July. **LYTHAM AS** Open Show. Lytham Baths, Dicconson Terrace, Lytham, Lancs. Schedules: Mr P. Ham, 1 Wyndens Grove, Freckleton, Preston, Lancs. phone Freckleton 632182.

10th July. **BASINGSTOKE AS** Open Show for Cichlids. The Carnival Hall, Basingstoke. Schedules: Mr C. Wells, 271 Overdown Road, Tilehurst, Reading, Berks., or phone Mr M. Strange, Basingstoke 67039.

10th-11th July. **ROMFORD & BEACONSTREE AS** Open Show (Dagenham Town Show). Central Park, Dagenham. Schedules (April): Mr R. Jones, 27 Thomas England House, Waterloo Gardens, Romford, Essex.

18th July. **SANDGROUNDERS' AS** Open Show (FNAS Show League). Meols Cop Secondary School, Meols Cop Road, Southport, Merseyside. Details: Mr G. A. Waterhouse, 23 Moss Lane, Southport, Merseyside, PR9 7DR (or phone Southport 24743, Mr S. Hooton).

25th July. **BRIGHTON & SOUTH-ERN AS** Open Show and Exhibition. St Barnabas Hall, Sockville Road, Hove, Sussex. Schedules Mr B. Savory, 11 Seaview Estate, Southwick, BN4 4AS (phone: Brighton 593851).

15th August. **OLDHAM & DAS** Open Show. Warneth Park, Oldham. Schedules: Mr A. E. Chadwick, 341 Roadway, Chadderton, Oldham; phone 081-652 0809.

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

22nd August. **LONG EATON AS** first Open Show. Details to follow.

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.

4th September. **FBAS** General Assembly, 2.00 p.m. Conway Hall, Red Lion Square, Holborn, London, WC1.

5th September. **BETHNAL GREEN AS** Open Show. Bethnal Green Institute, 229 Bethnal Green Road, London, E2. Schedules: Mr R. Dale, 14 Bulland Road, Wanstead, London, E11 2DY (phone: 01-989 9015).

11th September. **FBAS CONVENTION**. Meeting Room, Zoological Society, Regents Park, London, N.W.1.

11th September. **KINGSTON & DAS** Open Show. Details later.

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

15th September. **BRISTOL AS** Coldwater Open Show. Bishopston Parish Hall. Schedules: Mr E. N. Bowden, 17 Stoneleigh Walk, Bristol, 4; phone 770355. Postal entries close 31st August.

25th September. **HASLEMERE & DAS** Open Show. Show secretary, Mr L. Woolter, 5 Park Rise, Petworth, West Sussex. Details later.

23rd-24th October. **BRITISH AQUARISTS' FESTIVAL (FNAS)**. Belle Vue Zoological Gardens, Manchester.

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.

4th December. **FBAS** General Assembly, 2.00 p.m. Conway Hall, Red Lion Square, Holborn, London, WC1.

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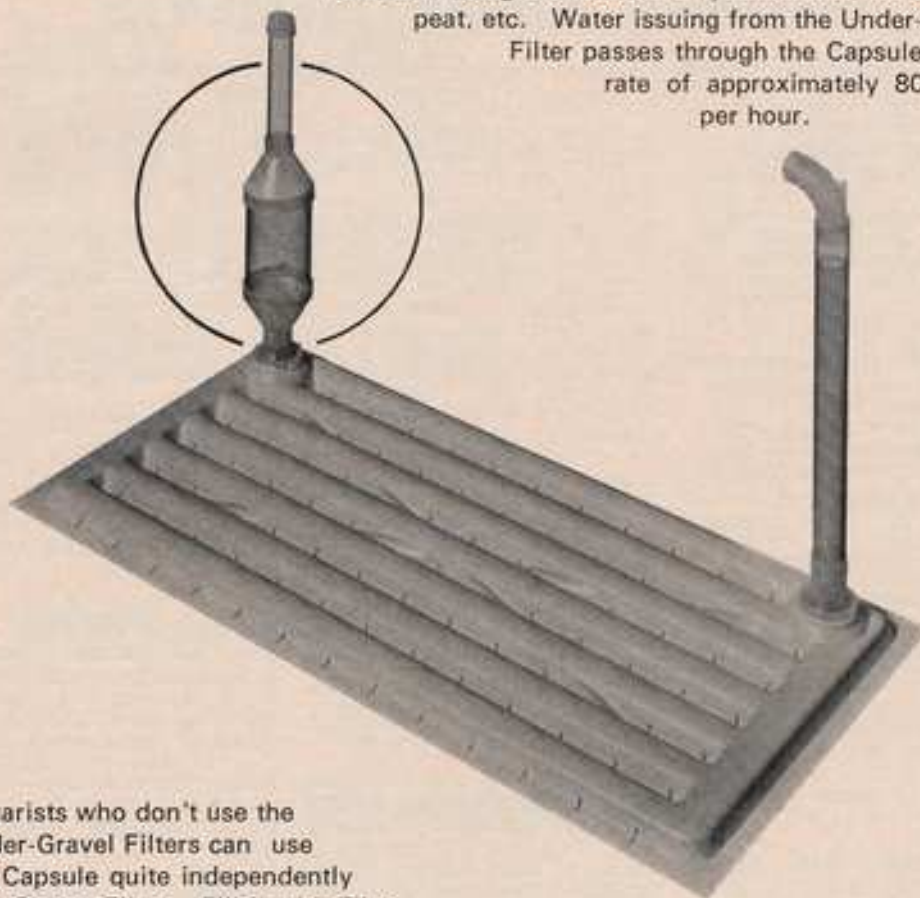
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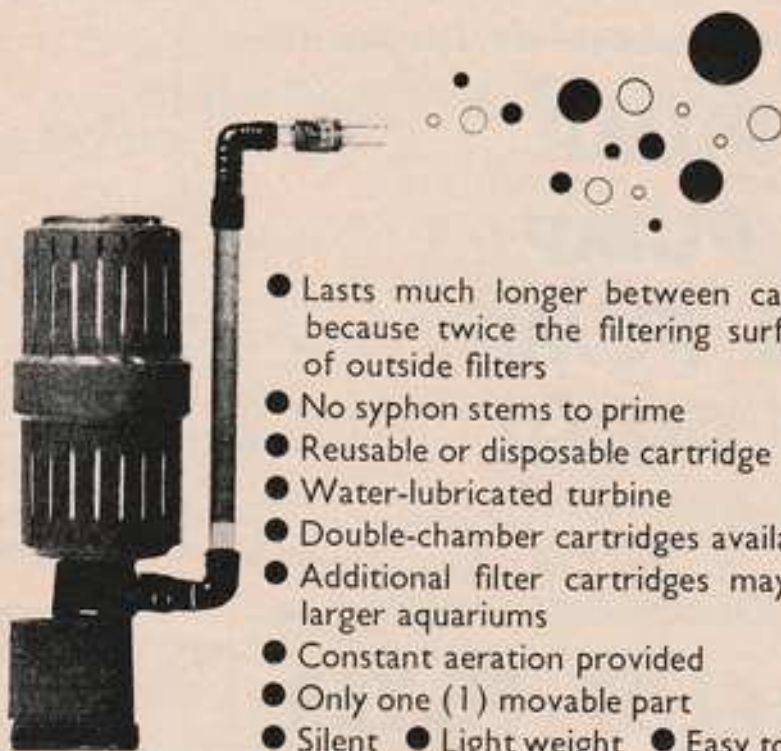
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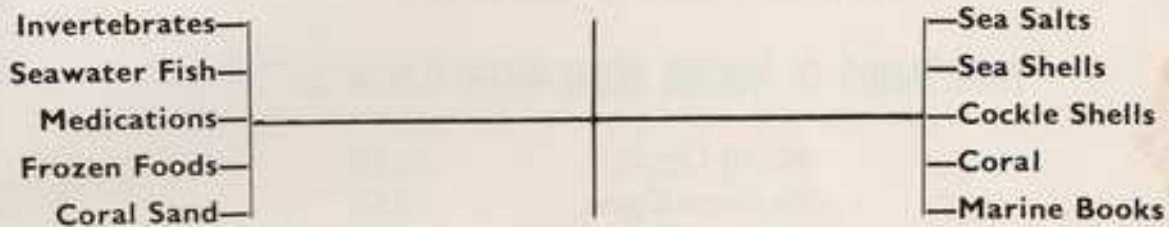
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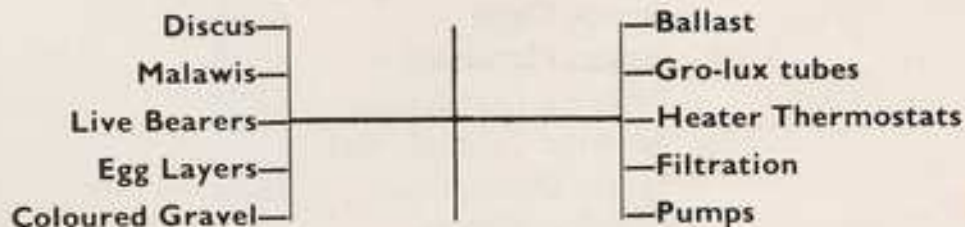
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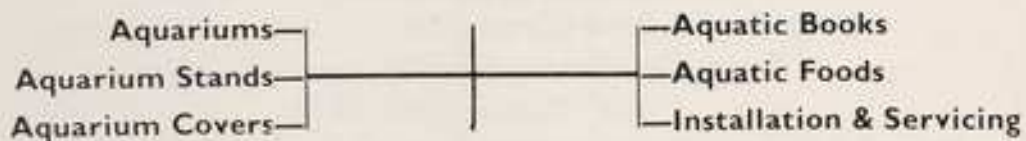
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HOURS OF BUSINESS—NOVEMBER-MARCH 10 a.m.-5 p.m., APRIL-OCTOBER 10 a.m.-6 p.m.

TERMS OF BUSINESS—Cash with order please. Fish sent by rail. Minimum order £20.00, insulated container and carriage £1.50 (Scotland £2.50). Plants by post (minimum order £2.50) please add 25p. post and packing on aquarium plants up to £3.00, and 50p. on orders over £3.00. Postage and packing on pond plants £1.