

March
1970

3/-
monthly

the
Aquarist
and Pondkeeper



the Aquarist

and Pondkeeper

Printed by Buckley Press
THE BUTTS . HALF ACRE
BRENTFORD . MIDDLESEX.
Telephone: 01-560 6221.

Subscription Rates The Aquarist will be sent post free
for one year to any address for
£2 1s. 0d. Half-yearly £1 10s. 6d.

MSS. or prints unaccompanied by a
stamped addressed envelope cannot be returned and no
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Founded 1924
as "The Amateur Aquarist"
Vol. XXXIV No. 12, 1970

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The Editor accepts no responsibility for views expressed by contributors.

Editor: Laurence E. Perkins

March, 1970

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THE HUNGRY HERPETOLOGIST

on holiday in Northern France



By Andrew Allen

Lacerta agilis male uppermost and female



DOUBTLESS there are many Reptile enthusiasts like myself, who, when on holiday, experience a desire to overturn stones and probe in the mud of foreign ponds. Sometimes they may find that this desire overwhelms the feeling of duty that makes one enter a Chateau or admire a Cathedral. The Continent is certainly the place for the amateur herpetologist to indulge in his anti-social tastes. For these fellow spirits this article is written.

Many holidaymakers heading to the Spanish sun whistle through Northern France without a backward glance. But it has a rich Herpetofauna, wider than our own, and of exceptional interest. What can be more pleasant than combining a bit of sightseeing, a spot of "Reptile-watching" and the sordid pleasures of the gourmet and the glutton? I have spent more than eight weeks in Northern France over the past two years and have enjoyed the combination immensely.

What species can be found? Our own common lizard is naturally present, but occurs in far greater numbers. It is fairly common throughout the region, but especially plentiful in the Loire country. Many are the days that I have sat on a boulder, the wide and majestic Loire at my back, and the mouldering wall of some ancient mansion, ivy-covered—and lizard-covered too—in front of me. The locals tended to consider my fixed attention on the old wall as indisputable evidence of English madness, but treated it with good-humoured condescension. This "activity" is a foolproof excuse for laziness, for it is "all in the cause of Science!" In high Summer these lizards can be found on the walls of castles, churches and houses

throughout the North, and they are a lively and engaging species to watch.

According to various authorities the Wall lizard (*L. muralis*) is found in Northern France. However, I have never seen any specimens North of the Loire. I have only seen two or three individuals among the thatch in the glowering Chateau of Loches. This species is best seen in the warmer climes of Mediterranean regions, or Central France.

Sand lizards (*L. agilis*) are not generally to be expected in this region. They occur mainly in the Eastern part—Artois, Picardy, the Belgian border country, Lorraine and parts of Alsace. They live in a wider range of habitats than in England, being found in hedgerows and woodland borders.

The green lizard (*L. viridis*) can be found throughout most of this region, except for the North-Eastern corner. It is found roughly to the West of a line ranging from the Seine estuary, Rouen, Paris, Troyes, to Belfort. Individuals can be found throughout the Northernmost part of this corner, especially in Brittany, and of course the Channel Islands where Wall lizards also occur. They are widespread around the Loire. Here they can be seen sunning on the minor roads, sometimes not even bothering to move on to the verge when a car passes. They live in hedgerows and are liberally dispersed along banks, and in sunny woods and heathland. They are an impressive animal in the wild, and a joy to watch, with their fine colours and lively movements. One baby lizard, a few weeks old, courageously attacked my fingers when I tried to deflect it from the path of an oncoming tractor on a minor

road near Tours. They are significantly more common at the sea end of the Loire than in the Eastern part.

The slow-worm is consistently abundant, more so than in England, though it favours the same types of habitat.

The snakes of the region are little more prominent than in England. Grass snakes (*N. n. helvetica*) abound in damp places everywhere. The adder (*V. berus*) is widespread in the drier areas, especially in the sparse, heathy woodland South of the Loire, on the moors of Maine and Brittany, and sunny enclaves in the chalk hills of Normandy. Over most of its range, excepting the extreme North, it overlaps with the Aspic Viper (*V. aspis*), which is most common in the West, but makes local appearances in the Vosges mountains. The French almost worship the "Aspique," whilst they deride the slower "Peliade." They suffer from the same persecution mania in respect to snakes as do our countrymen, but every specimen killed, usually after a heroic struggle, is claimed to be an "Aspique." The aspic viper is certainly more lively, but often steals the thunder from its more sedate cousin. I have examined bottled "Aspiques," and been able to pronounce them "Peliades." The danger of snakebite in this part of France is considerably greater than in England, but is still a matter for little concern. Care should be taken, especially in drier parts of the Sologne.

A number of newts inhabit the region, including our own Smooth, Crested and Palmate species. The last mentioned is especially common, often in company with the other two. It may be found in the brackish waters of the Breton and Vendean marshes. The Alpine newt (*T. alpestris*) may also be encountered. The beautiful marbled newt (*T. marmoratus*) is present, and may be found as far north as Paris. However, newts are no more readily encountered than in England. The Fire Salamander is local in the North, though I have never found any specimens. It is more common in the eastern areas such as the Vosges mountains.

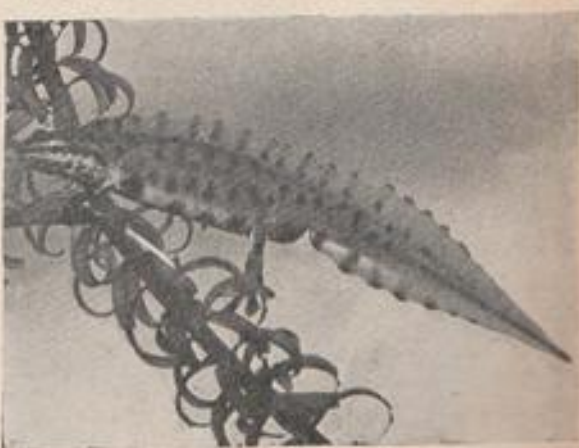
The Yellow-Bellied toad (*B. variegata*) occurs near Paris, but especially in the hilly country of the East, from the Belgian border and Ardennes to the Vosges mountains. The Mid-wife toad (*A. obstetricans*) is distributed widely, especially in the East, under stones, but is not often encountered due to its nocturnal habits. According to some authorities the Spade-foot toad occurs right up to North-Eastern France but I never encountered any specimens, nor had certain French naturalists to whom I spoke. *Pelodytes punctatus* is widespread, especially in low areas, where it lives after the manner of the Edible frog. I have found many in the large lakes of the Forest of Orleans, but it occurs right up to the Belgian border.

Both the common toad and Natterjack (*B. calamita*) are widespread in the region, but are no more prominent than in England, as is the case with the Com-



Common Lizard (top)

Male Common Newt (lower)





Crested Newt (female) top
 Palmate Newt (male) lower



mon frog. The Moor frog (*R. arvalis*) is also locally distributed in the North-East of the region, while the Agile frog is present but uncommon. I found a young specimen in the Sologne forest, but encountered no adults. The Edible frog is very widely distributed everywhere. Almost every ditch and pond is invaded by it. I have counted dozens of specimens in ditches near Chambord, despite the presence of large pike. They are colourful and interesting to watch, and a walk beside any waterway will provoke a cascade of "plops."

Obviously the herpetologist in Northern France has a wide variety of diversions. But even in the heart of Paris itself the amateur Reptile enthusiast is not far from his hobby. He can rest after "doing" Notre-Dame, Place de la Concorde, Eiffel Tower, Arc de Triomphe, Louvre, and all the old favourites. He can browse among the petshops of the Right Bank. The animals are often in poor quarters, but unusual finds can be made—Matamata's and Teju's, Caimans and monitors. There is a fair sample of local species too. Or he can spend a pleasant hour or two among the Reptile collections at the Jardin des Plantes. The range is different from that available in our own zoos, and the exhibits are very well presented.

Throughout Northern France the Reptile enthusiast can safely indulge in his hobby. The best areas from the herpetologist's point of view often coincide with the best holiday areas, and the best gastronomic regions. Certain regions are outstanding on all counts: the vast pine-covered mountains of the Vosges; quiet, rolling Alsace; the romantic Norman Switzerland; old and sleepy Maine, with the Mancelles Alps and its gentle rivers; the moors and cliffs of Brittany; the lost marshes of the Vendée; gentle, fruitful Touraine; and the vast Forest of Orleans, the rock-strewn forest of Fontainebleau, and the sleepy, marshy forests of the Sologne. What can be more delightful than a day spent in superlative countryside rooting out frogs, or dozing before a lizard colony, with some French cheese and a Paté de Campagne? An occasional Chateau will make an interesting diversion from these more serious facets! When the lizards retire then so can you, to stoke yourself up with Saumon de la Loire, Quenelles de Brochet, Camenon au Sang Solognote or Poulet Tourangelle, if you are on the Loire, with a bottle of Vouvray perhaps, or Chinon. Or perhaps a "Degustation de Fruits de Mer," accompanied by a Muscadet in Brittany. Perhaps you could try some Sole Meunier with a Calvados in Normandy, or some Caille Farcie with a Riesling in the Vosges. You are accessible to joys denied to the ordinary run of the mill tourist, who is consigned to dreary sightseeing. The hungry herpetologist in France will have a very filling time.

Do you know this plant?

by Bill Simms

Bacopa amplexicaulis

This plant has suffered from being re-named a number of times. Perhaps this is because it grows wild in the U.S.A., where it is common near the southern parts of the Atlantic coast. There it can be studied by many people, and they all appear to have had a go at naming it. Some of these names are *Herpestis amplexicaulis*, *Monniera amplexicaulis*, and *Bacopa caroliniana*.

It is a marsh plant, and therefore needs lots of light to grow properly. When grown above water the aerial leaves are somewhat thicker. Because it comes from the warmer parts of America it should do well in warm water, but I have grown it in a cold aquarium that never dropped below 58 degrees F.

A tropical aquarium is often recommended as the proper place for it, and there, providing that the light is strong enough, it will grow reasonably well. It will tolerate a temperature rise up to about 72 degrees F., but above that it becomes very soft and sickly. Its best temperature range is 63 to 68 degrees F., so that for an aquarium kept as cool as this it is admirable.

Contrary to the usual practice a number of cuttings can be bunched together for rooting. I have done this, and then transplanted them out separately, but the roots are badly tangled. If separate plants are required they can be inserted singly in the first place.



PRODUCT REVIEW

LAGOON AQUARIA.—Sole Distributors: Cheltenham Aquatics, 10-11 Suffolk Parade, Cheltenham, Glos.

A new exciting development in the aquarium world is the introduction of the unique Lagoon Aquarium. Embodying the latest techniques of the furniture industry, this aquarium is of all wood construction. Integral in the design is a hinged canopy, legs, and a control panel with two switches for the operation of the pump and lights.

The glass front is sealed with silicone-rubber and all inside wood surfaces are coated with special waterproof sealants coloured pastel blue. External finish is natural wood coated with polyurethane for a chip-free resistant

surface. The legs and picture-frame front are in matt black.

One of the advantages of the design is that it enables the aquarium to be sold as a complete unit with all the electrical wiring, lighting, pump, filters and heating equipment already installed, so that all the customer has to do is furnish the aquarium, fill up with water and plug in.

At the present time, however, due to demand on the basic model, orders can only be accepted for complete units on a "special order" basis.

Specification: Size 24 in. x 12 in. x 15 in.; height 33 in. including legs.

Retail price of the standard model £15.

THE RUDD

*Scardinius
erythrophthalmus*

□

By A. Boarder

□

THIS FISH is fairly well distributed in England and much of the Continent, but does not appear in Scotland. It is often confused with the Roach, especially with young fish. The chief difference between these two fishes is that the Rudd has two rows of pharyngeal teeth whilst the Roach has only one. This difference is not apparent to the casual observer but a better test is to inspect the origin of the dorsal fins on the two fishes. The Roach has the dorsal fin starting directly above the origin of the pelvic fins whereas the Rudd has the dorsal fin farther back.

The general shape and colour is rather similar in the Rudd to that of the Roach, but the former has redder fins especially the caudal. The overall shape is not always a good guide for differentiation as some Roach are deeper in the body than others and so approach the Rudd in body shape. The Rudd has a golden iris to the eye but that of the Roach is red. The Rudd prefers rather sluggish waters and is usually found in large reservoirs and lakes. A muddy bottom with plenty of plant life suits this fish. The food of the Rudd consists of small animal life and vegetable matter. It will also take flies from the surface in warm weather.

This fish is more generally used as a pond and aquarium fish than the Roach as it does not appear to be as liable to contract Fungus diseases as the Roach. There is a golden variety which is more handsome,



especially when seen as a shoal of small specimens in a fair-sized tank. Once such fish reach a size of four inches overall it is better to transfer them to an outside pond than to try to keep them in good health in a tank. This fish can grow much larger than the Roach and a specimen of four and a half pounds has been caught.

The Rudd spawns in spring, during the months of April and May. The spawning is very vigorous and takes place among water-side plants in shallow water. The eggs are small and laid in large numbers but singly, adhering to the vegetation. Hatching time depends on the temperature of the water, but usually it takes about ten days to a fortnight for the fry to hatch. The feeding and growth resembles that of the goldfish.

When kept in a tank make sure that the water is in good condition and do not overcrowd. Few rocks are necessary in the tank as this fish is a fairly active swimmer and needs plenty of space. The food can be of a mixed type and can be of the same type as that used for goldfish. Occasional live food is appreciated. To spawn the fish in a pond it is necessary to have plenty of fine-leaved plants at a shallow part of the

pond. As with many other fishes these are not averse to eating the eggs when laid and also the fry when hatched. It is therefore a good policy to remove the bunches of weed with eggs to be hatched and kept in a safe place away from the parent fish. The hatching and rearing resembles that of the goldfish, and it will be found that rather warmer water than that of the pond will suit the fry much better than colder conditions. It will be found that the fry will grow more quickly and eat much more food when warm, but as with goldfish and most other fishes the growth will be controlled greatly by the amount of swimming space available. The spreading out of the fry at an early age will ensure that they can grow at their maximum rate. The warmer the water, within reason, the more active are the fish and unless they get plenty of food they will not grow on well.

Although the Rudd is a good fish for the pond it must be realised that the normal coloured type will not show up very well, as the dark coloured back is a good protective colouring and so viewed from above the fish is difficult to see against a dark background. It is therefore better to use the golden Rudd for the garden pond.

UNIFICATION, NOT VARIETY

By Nicholas A. McDowall

FOR TWO YEARS I had owned a 24 in. x 12 in. x 12 in. aquarium filled or rather overcrowded with every type of fish that caught my fancy. It must have been the extensive gadgetry for filtration and aeration that kept them all alive with never even a hint of a disease. However, I thought it was time I moved onto something a little bigger, at the same time learning from the mistakes I had made. I sold the old aquarium—contents, stand, the lot—at a great loss for a mere £8.

With this money I sent away for a 36 in. x 15 in. x 15 in. aquarium frame, a hood and also enough glazing compound from one of the firms advertised in the back of *The Aquarist*. This soon arrived and I wondered about glazing it myself. In the end I took it to a nearby glass shop and had it all done with $\frac{1}{4}$ in. plate glass reinforced at the bottom and frosted at the back—mistake, I can't see the background landscape I made myself, very clearly. The next problem was where to put it. Living in a flat has its space problems, you see, but I eventually solved it in a most ingenious way. It spans the gap from the landing bannister to the wall on the other side of the stairs. This has two other advantages as well as not taking up valuable space: a

sturdy shelf 15 in. wide and a batten fixed to the wall are all that is necessary to support the tank, no costly stand to buy or make taking up more valuable room, and also the aquarium backs on to a wall forming one side of our bathroom cupboard, I can put the pump and switches in here and have the air line and electrical supply coming through two small holes in the wall to supply the tank. Thus there is no clutter and the whine of the pump is effectively silenced.

By the time I had bought the pump, filter, gravel and plants—also from one of these firms, I was already £4 in the red. By the way, 50 assorted plants for £1 means near enough 50 vallisneria of assorted sizes. It was in setting up the tank that I learnt from previous mistakes. In the 2 ft. tank I had used a base plate type of undergravel filter, experimenting with and without peat to see the effect on plant growth. Never mind the effect on plant growth, the action of the filter drawing water through the peat soon discoloured the water till it was almost black. This time I put a mixture of clay and peat under the gravel, with just an outside filter. The plants grow very well.

Now came the moment I had been waiting for, the fish. A community tank is all very well, but I wanted something with a bit more unity to it. A shoal of neons would be just the thing. At the moment I've got about 25 and they look very beautiful swimming together uncluttered with other fish stealing the limelight. I reckon the tank can hold two or three times that number comfortably but I haven't got the money yet.

NEW PIPEWORK AT THE LONDON ZOO

AT THE LONDON ZOO AQUARIUM, approximately 1,200 ft. of ABS plastic pipework has been installed to carry air, and fresh and salt water to and from tanks containing tropical and cold water fish, amphibians and marine reptiles. In many instances, the new pipework, which is manufactured by *Durapipe & Fittings Ltd.*, Bentinck Road, West Drayton, Middlesex, replaces the original glass-lined cast iron and galvanised pipework. ABS was chosen because it is economical, it remains unaffected by the corrosive action of sea water and is easy to install. No specially trained technicians were needed to make the installation, the lengths of pipe being simply cut with a hacksaw and solvent welded to the fittings. Standard Durapipe fittings were used to join the plastic pipework to metal components such as pumps.

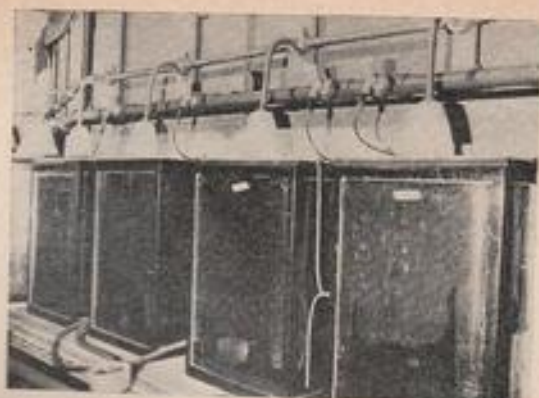
900 g.p.h. Biscay Water

Sea water is imported by London Zoo from the Bay of Biscay because of its purity. This is unloaded into a 10,000 gallon reservoir. The water is then pumped up from this reservoir to a 100 gallon gravity tank. From here, the water flows down through four show-cases in the tropical marine department of the aquarium. The water flows on to a 60 gallon filter bed, into a 10 gallon capacity filter bed and finally to two 100 gallon reservoirs. The water is pumped up again from the reservoirs to the gravity tank. The maximum rate of flow is approximately 900 gallons/hr. in the tropical marine section, and 500 ft. of ABS are used in this system in 2 in. and $\frac{3}{4}$ in. sizes. Since ABS can withstand temperatures up to 80°C, it is unaffected by the temperature of the water as it leaves the heaters on its way to the tropical tanks.

The flow of fresh water is similar. In the amphibian section, water flows from a gravity tank to the twenty tanks near the entrance to the aquarium. Approximately 1,500 gallons per hour flow to these tanks through 500 ft. of ABS and the water then descends to filters and reservoirs, from which it is pumped up again to the gravity tank.

Connecting ABS to metal

When the weather is warm, both sea and fresh water are pumped through a refrigeration plant and up into a cooling tower outside the building, and for this



1

Fig. 1 ABS pipework brings water (originally from the Bay of Biscay) to reserve tanks for sea water fish.

Fig. 2 The back of the amphibian tanks at London Zoo's aquarium. In this section, approximately 1,500 g.p.h. of fresh water flows through 500 ft. of Durapipe ABS.

2



system 200 ft. of ABS are used in 3 in., 2 in., $\frac{3}{4}$ and $\frac{1}{2}$ in. sizes. The plastic pipework was easily connected to cast iron pipes and to the metal branches of pumps, compressors and valves. In most cases ABS flanges were used with a rubber gasket fitted between the plastic and the metal flange.

Further installations

ABS pipework has proved so satisfactory that it will be used wherever possible, not only in the aquarium, but in other parts of the Zoo also. 50 ft. of 4 in. ABS have already been installed in the Snowdon Aviary to carry water being pumped to a waterfall and cascade.

**THE AQUARIST
& PONDKEEPER
FISHKEEPING
EXHIBITION**

ALEXANDRA PALACE

Wood Green, London, N.22

**FRIDAY □ SATURDAY □ SUNDAY
10th, 11th AND 12th JULY**

All indications point to success for the Aquarist and Pondkeeper Fishkeeping Exhibition for which preliminary arrangements are well in hand.

The exhibition, covering nearly 20,000 square feet will be another major event in the aquatic calendar. It opens on Friday, 10th July, and continues until the following Sunday evening, three days in which the best and latest fishkeeping skills will be on display. A vast amount of expert organisation is necessary for an event on this scale and the sponsors are once again indebted to the Federation of British Aquatic Societies for their willing and capable co-operation in planning and running the exhibition. Thanks go to the enthusiasts who have offered their services as stewards, many more are needed for the build-up period and for the duration of the exhibition. The Show Secretary, Mr. S. Mooney, 44 Coniston Road, Muswell Hill, London, N.10, will be pleased to hear from anyone interested and available to act as a steward.

Additional competitive classes have been suggested for the exhibition and the schedule will comprise of the following classes:

Society Furnished Aquaria Tropical
Society Furnished Aquaria Coldwater
Individual Furnished Aquaria Tropical
Individual Furnished Aquaria Coldwater
Individual Furnished Aquaria Marine
Junior Furnished Aquaria
School Furnished Aquaria
Society Junior Furnished Aquaria

Pairs of Mollies, Platys and Swordtails
Pairs of Guppies
Pairs of A.O.V. Livebearers
Pairs of Cichlids
Pairs of Characins
Pairs of Danios
Rooted Plants (one plant will comprise an entry)
Cuttings (three cuttings of same species or variety will comprise an entry)

Show Schedules will be made available in the very near future from the Show Secretary.

Handsome trophies will be awarded for each class together with Souvenir trophies and Award cards for first, second and third place winners, fourth place winners will also receive Award cards.

An immense amount of energy and organisation is being put into planning the Exhibition by the Federation, Show Officials and willing helpers and it will continue right up to the opening day to ensure this event will be one that no aquarist can afford to miss.

BOOK THE DATES.

FRIDAY, SATURDAY and SUNDAY 10th, 11th and 12th JULY

A NOTICE TO THE TRADE

Any company interested in exhibiting at the exhibition should contact The Show Organiser, The Aquarist and Pondkeeper, The Butts, Brentford, Middlesex. Telephone 01-560 6221.

SOME SMALL CUSHION STARS

*Junior
Aquarist*

By Bill Simms

ALTHOUGH the majority of sea-stars are risky inhabitants of the cold marine aquarium, there are just a few of the smaller ones that can be used at times. These are the cushion stars, which are mainly characterised by having such short arms that they could be most accurately described as pentagons with concave edges. For a long time this group of sea creatures has been given the name of a star-fish but the term is misleading for they are not fishes at all. The newer term of sea-stars is preferable.

All our sea-stars are carnivorous, feeding on any animal matter they can reach. Their method of attacking such seemingly difficult prey as oysters and mussels is particularly revealing, for the sea-stars are much more active than their appearance when stranded on the beach would indicate. They live in the water just below the low tide mark, or deeper, and there do a lot of damage to shellfish. The sea-star settles on its victim and spreads its arms on each side of the shell. There, a secure grip with its numerous tube-feet enables the sea-star to exert enough strength to force open the shell by brute force. Then the soft parts of the shellfish are sucked whole into the stomach.

Underneath the sea-star, as well as the multitude of tube-feet, there is the mouth, placed centrally, and

this is capable of great expansion. So much so that it can easily take in the average shellfish complete with its shell when necessary. This the cushion stars have to do, because their arms are too short and stiff to encircle their victim. Therefore, if you restrict your choice of cushion stars to the very small ones, and keep them well fed with pieces of raw fish, mussel, and similar titbits, you should have little trouble. But, because they are carnivorous, they require watching.

The smallest of the cushion stars is also one of the most common. It is *Asterina gibbosa*, which can grow to about 4 inches, but the majority of specimens found are only an inch across—a nice handy size for a marine aquarium. Its main upper surface colour is yellowish-green, but this is often mottled with tints of brighter green, cream, and even red, so that a well-marked specimen can be pretty. Its mosaic of colours helps it to merge into its surroundings so it is not easy to find although so common.

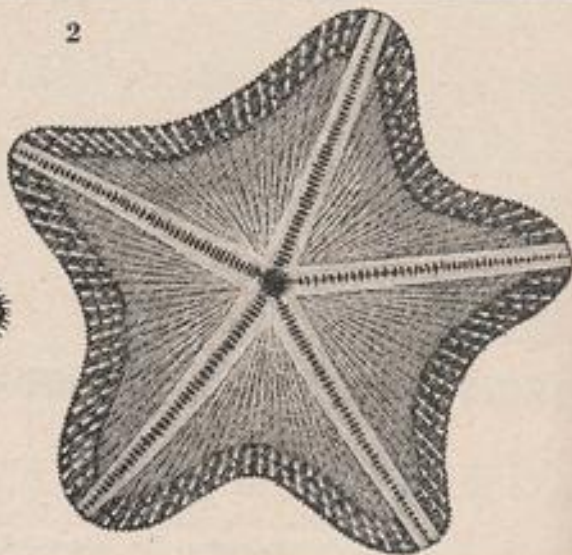
To search for one, choose a low spring tide. These

1. *Asterina gibbosa*
2. *Palmipes membranaceus*
3. *Porania pulvillus*

1



2



occur every fortnight, and as the tide goes out you can follow it down searching the likely spots. Under stones and the overhangs of rocks are the best places but do not miss any of the pools left behind on the lower reaches of the shore. Then search in the sea itself, as far out as you can manage. If you are in the south or west you should have no difficulty, for that is where they are mostly found, preferring less-cold water.

Another smallish cushion star is *Porania pulvillus*. It rarely grows to more than 4 inches, like the previous one, but the smaller specimens may be nearly 2 inches across. This cushion star is thicker than the others for the very short arms rise steeply to the central disc. The bottom is flat. It is smooth, and somewhat greasy to touch but is well worth securing. There is more colour to this small star for it is scarlet, occasionally marked with white, but some specimens are yellowish-white. Underneath it is quite white. It can be found in the same sort of places as the previous one but it is common all around the coast except for a large part of the east coast.

A larger cushion star, but a more colourful one, can be found all around Britain except for the lower half of the east coast—they are singularly short of cushion stars in that area. It is *Palmipes membranaceus*, a thin, leathery looking star that reaches as much as 8 inches across. Younger ones can be found, however, and these are pretty. Its colour is mainly red, with the red colour creeping around the edge to encroach on the yellow underparts. Even when dead some of this red colour persists on top.

Try some of these cushion stars, but make sure that you have no sluggish or sick fish on the bottom—they would help them to die.

3



March, 1970

FRESHWATER INVERTEBRATES

By Alan Petherick of 4 Ways Tropical
Aquaria

THE KEEN TROPICAL aquarist is always interested in any new arrival on the scene and I am pleased to report my recent acquisition of two species of freshwater shrimps and prawns. Not only do they provide us with a useful addition to the range of scavengers, but they add new variety to freshwater aquariums in that, apart from the few snails (which are often avoided by aquarists because of the hazardous effect many of them have upon plant life), they are the only invertebrates to date which are suited to tank life.

These freshwater prawns and shrimps of the genus *Macrobranchium palemon*, have arrived only recently from the Far East and have provided us with some of the most efficient scavengers yet. Living at the bottom of the tank they are for ever moving about amongst the plants and rocks; delving into places with their short claws that are generally inaccessible to other scavengers and clearing the bottom of much waste matter.

At present only two species have been imported into this country—the *Macrobranchium scabriculum*, which is a small prawn growing up to 5-6 cm in length and the smaller *Macrobranchium stimatus* or shrimp which is far less common and is ideally suited to live with small fish.

Very little is known about their breeding habits although I have succeeded in obtaining about 200 young prawns from a parent prawn about 2 inches long.

I hope to obtain soon the third and largest invertebrate of the family, known as *Macrobranchium rosenbergii*, which grows up to 30 cm (10 to 12 in.) long and is therefore more suited to live with larger fish.

All these invertebrates are slow moving and their colours offer a perfect camouflage when they are found in their natural surroundings, which is generally in small freshwater streams.

Macrobranchium scabriculum is a sandy colour with brown specks and the *stimatus* has a russet-ringed effect.

They all shed their skins twice a year leaving a perfect replica of themselves on the bottom of the tank which one should be sure not to mistake for the remains of a dead animal.

These invertebrates offer, therefore, an entirely new challenge to the aquarist who likes to discover for himself the habits of his tank's inmates and they provide a refreshing tonic to the freshwater aquaria.

WHAT IS YOUR OPINION?

By B. Whiteside



HAVING HAD MIXED DEALINGS with postal suppliers of aquarium plants, I decided to ask readers what they thought about plants ordered by post. The first letter came from Mr. B. Hepburn, of Ash, Aldershot, Hants. He found that the two firms from which he obtained plants both gave exceptional value. He recently received a £1 collection of plants from a dealer in Kidderminster, and he was amazed at, and well pleased with, the plants which he received. The plants were very well packed, and were in excellent condition. His one complaint is that it would be of great assistance to the aquarist, especially the novice, if dealers would label plants. Another question concerned the hardest type of fish to net in the aquarium. Mr. Hepburn nominates the sucking loach. The fish moves when apparent danger threatens, and goes at such a rate that he has often given up trying to catch it.

My local dealer suggested that the quality of the smaller tropical fish was falling off. Mr. Hepburn disagrees entirely! As regards the siting of one's main battery of tanks in the house, Mr. Hepburn says that his are kept in his sitting room. He has three tanks: a large show tank, a "bringing-on" tank, and a small breeding tank, and these are built into a chimney recess. He did have the tanks "all over the place," as his wife put it, so he built a wooden stand in a convenient recess, and he is now "back in favour." Mr. Hepburn does not use glass wool in his filters—only polymer wool, and he does not have cover glasses over his tanks—only the normal hood. Being an angler, as well as an aquarist, he is interested in a fresh water agarid, and would like any information which readers can give. (To be honest, I've never heard of it!)

Mr. Geoffrey Hough, lives at Cheadle Hulme, Cheshire, and, when he stocked up with plants, on starting the hobby just over two years ago, he got his supplies from a London dealer offering, as he still does, fifty plants, 30s. 0d. in value, for £1, and he was quite happy. Many of the plants were quite small, but he realised that his "something for nothing" attitude hadn't paid off. Later, when he changed to tropical fish, he tried a firm in Oxford. He sent £1 and asked for plants to that value, which fulfilled certain requirements—for a community aquarium with strong

lighting and soft water. He didn't order any plant by name, but was very happy with the resulting delivery. The plants were carefully packed, and good value for money, the Indian fern being particularly good. A few months later, he repeated the order, when he needed plants for a show tank in school. He again didn't specify any plant, only giving the general conditions for which they were required. Again the plants were admirable; one damaged in transit was replaced without any trouble. The firm in question no longer advertises its plant sales, and is a member of the "marine brigade" now, so Mr. Hough's next plant order will have to be placed in London. The reason why he uses postal dealers is one of economics. His local dealer, who is excellent in many respects, sells plants at prices which are too high for Mr. Hough, unless he only wants to buy, say, one Amazon sword. Plants are rarely cheaper than 3s. 6d. each, and although Mr. Hough knows that the plants which he gets from London will be very small, they will grow, and will have been cheap. One complaint is the limited variety of fish and plants generally available. Mr. Hough knows that there are probably about eighteen species of *Cryptocoryne* available, and about eleven of *Aponogeton*, but why can he not get hold of decent floating plants, he asks, and he wonders why, when a book specifies that a fish, X, prefers a plant, Y, that one cannot get hold of the plant, Y, anywhere. He asks where Mr. Jack Hems' correspondent (*The Aquarist*, December, 1969, page 270) obtained his Java moss.

Mr. Hough would like some advice about where to place the tanks in his home. He has a tropical aquarium, one for terrapins, and one for goldfish, and these are perched precariously on window ledges, old sewing tables, and a specially constructed shelf in a corner; a most unsatisfactory system of wiring and air lines snake everywhere. He hopes to rationalise the system soon, by installing shelving for three tanks, with a shelf for gramophone records above. The problem is urgent as his wife has just presented him with twins, and conditions would need to be safe. He would also like to install a large tank for goldfish in his hall, but it will have to wait.

The next letter comes from Mr. M. Tyrrell, who is the show secretary of the Kettering Aquarist Society,

and he finds that the hardest fish to net is the horse-faced loach, as it has a nasty habit of diving beneath the gravel. He would nominate the khulli loach as the second hardest fish to net, although he uses the same method as many dealers, i.e., he places a 4-in. length of hose pipe in amongst the plants, and the khulli usually swims in quite quickly. With a finger at each end of the pipe, the pipe and fish can be removed. Mr. Tyrrell thinks that the quality of smaller tropical fish is definitely lower than when he started up in the hobby—especially in the case of live-bearers. He thinks that many beginners start off with low-quality live-bearers and breed from these; they do not consider that to get good quality young, good quality parents are essential. They let any fish inter-breed and, when the tank becomes overcrowded, they take all these weak fish to their dealer, who is happy to give a bob apiece for them; another novice comes along and the whole thing is repeated. On the question of the use of cover-glasses, Mr. Tyrrell simply lays the glass on top of the angle, in stainless steel, or nylon-coated tanks, but with ordinary angle iron frames he uses clips. He has used both metal and nylon clips, and finds the latter to be a bit weak for large or thick cover glasses. Mr. Tyrrell ends his letter by saying that he thinks that this series is about the most consistently good in *The Aquarist*, although he doesn't always agree with the views expressed; however, he always finds something to interest him (surely a fine tribute to all those who write to me sending their opinions).

In last month's issue Mr. J. W. Buck, of Milford Haven, begged that I find out about the excellent plants on display in aquaria at Chester Zoo. As other readers had asked the same question, I wrote to Chester Zoo. I was delighted to get a reply from Mrs. June Williams, the curator of the Chester Zoo Aquarium. I posed a series of what I thought would be interesting questions; my thanks to Mrs. Williams for her most interesting replies. We all appreciate the trouble which she took in giving such concise answers. She must be congratulated on having plants which are so good that readers write to me to enquire about them. I only wish that I could get to see them for myself, being particularly interested in plants. Perhaps I will, some day! The Chester Zoological Gardens' Aquarium consists of eighty tanks which are made of reinforced concrete, with glass fronts (no metal). The tanks are separated from each other by a sand filter; water is lifted from the top of a tank into the filter, passing through the filter's sand, and back into the tank through a hole in the bottom. The filters are cleaned twice a week. The types of rocks and gravel in the aquaria vary, but all have been collected from the beach. Wood is used in most of the tanks—mainly willow with hard, thriving roots, which have been well soaked, or collected from local

ponds. In general, no peat, clay or other plant foods are used, although sometimes peat and clay are used to help larger plants such as Amazon swords, etc. There are several varieties of snails in the Aquarium, but their numbers are kept to a reasonable level. Mrs. Williams finds that *Cryptocorynes* are the most successful in her aquarium. Although water from each tank is allowed to flow, via the filter, to the next tank, and so on, she finds that certain plants are more successful in some tanks than in others. Having eighty tanks, she adjusts accordingly. She finds that *Cryptocorynes* are better if left undisturbed for at least two years after planting, and then thinned as they become matted.

All the tropical tanks at the Aquarium are between 15 in. and 24 in. deep. Daphnia is the main food which is fed daily throughout the year; occasionally a little fish, meat and dried food is used. The lighting supplied is part daylight, and part electric light—about half and half. She uses a 100 watt bulb over every three feet of tank in the winter, and 60 watts in summer; these are switched on for about twelve hours per day. Heating is by means of a copper heating element which runs the full length of each tank, under the gravel, and the temperature varies between 74° and 80°F. The water in the tanks is on the hard side, and is from an artesian well. There is considerable loss from leaks, etc., and a 5 per cent top up daily is necessary. The tanks are never cleaned out completely. New cuttings from the old *Hygrophila* plants are taken during the summer, and these are set in the gravel of the exhibition tanks. As the new plants become established, the old plants are thrown away. The plants are not allowed to grow out of the water. Amazon swords are allowed to flower, and the young plants, when large enough, are planted in the exhibition tanks. When the large plants get too old, they are taken out, and the young plants are allowed to take over. This practice is followed with most of the larger plants. At Mrs. Williams' Aquarium, it has been found that *Gabomba*, *Myriophyllum* and *Vallisneria* do not thrive. Mrs. Williams ends her most helpful letter by offering to answer any other queries which we may have. Any more, readers?

Mr. W. Kilby writes from Kimbolton, Hunts., and he has found that plants, ordered by post, have been stringy upon arrival, but good care soon cures this. He has found that the red-tailed black shark is the hardest fish to net, because of its subtleness of moving and hiding. Scissortails come a close second, but it depends upon the plants and rocks in the tank concerned. Mr. Kilby keeps his tanks in his bedroom, but he has also one in the kitchen. The airing cupboard is used in an emergency, and for fish awaiting transport. Synthetic nylon wool is better than glass

wool, he thinks, as it holds more dirt, and can trap smaller particles of dirt than glass wool. He has found that the colours in some synthetic aquarium gravels soon wash out, and the remaining gravel looks dull and uninteresting. Mr. Kilby would like readers' comments on Gro-Lux lighting. (We have had this question before, but the response to it was poor. Have you found that it improves plant growth, and does it affect reproduction in live-bearers? A friend of mine, Mr. B. McAuley, a Belfast aquarist, has managed to get hold of a fluorescent tube called "North Light." He has fitted this over his show tank, and it gives an attractive bluish-green colour producing a cool effect in the aquarium. Have any other aquarists used this tube, and how has it affected plant growth?)

Mr. R. Holmes lives at Wittering, Peterborough, and he has had several unfortunate experiences when plants have been ordered by post; however he continues to order plants by post as the larger mail order firms offer a selection which is not available at local dealers' shops. He recommends that aquarists with limited means, but plenty of patience, should avail themselves of the "bargain bumper bundles" offered. He once did so and received, for his pound, a very small and discouraging parcel of messy stumps, minute plantlets, and cuttings with barely enough leaves to identify the plants. He planted the lot, and was eventually rewarded with a magnificent display of plants which were propagated to fill several tanks. Some of the specimens developed into plants worth a pound each. Ordering named, mature plants, with the object of setting up an "instant" furnished tank, is often unsatisfactory; but this is often not the fault of the supplier. Most aquatic plants are incapable of supporting their own weight, out of water, so that, no matter how well packed, they deteriorate rapidly. The beautifully planted tank soon degenerates to the state of the bargain bundle buyer's, with the added disadvantage that its owner has spent a lot more money and finished up two weeks behind in the race. If possible, it is better to visit a large firm, select one's own mature plants, and *carry them home in water.*

Mr. Holmes thinks that most fishes are easily caught, as opposed to netted, in a planted tank. It involves only a brief study of the subject's habits, and the application of a little piscine psychology. Khuli loaches, for example, are often responsible for a planted tank finishing up like a bowl of bouillabaisse; yet they will rapidly enter a narrow, opaque tube, laid on the gravel. It is then a simple job to remove both tube and fish, covering each end. Many other difficult species will obligingly swim into some form of trap, baited if necessary. Mr. Holmes thinks that "the hardest to catch, using any method," must be an adult male swordtail. As regards the quality of the

smaller tropicals, Mr. Holmes says that a good fish is still as good as a good fish ever was; but he has noticed a greater proportion of bad fish in many batches offered. Danios with broken lines, "whale-nosed" barbs, and live-bearers with obvious spinal deformities seem to be more common than they once were. The remedy is, surely, in the dealer's hands—he should change his supplier and, even, shop around a bit; if he doesn't, his retail customers soon will. (It is probably easier for the English dealer, than for the dealer in N. Ireland.) What bothers Mr. Holmes more, is the drop in the current definition of "saleable size," which is getting so low that he anticipates that we shall soon be shopping for eggs. Most people would, he thinks, rather pay a little more, and get a little more.

"There are female aquarists, you know!" Mr. Holmes says. "I have heard more husbands than wives complain about their partner's hobby. Most 'fish widows,' apart from their occasional justified moan about soggy carpets and disappearing kitchen utensils, seem to me to be remarkably tolerant. Some even acquire an interest in the hobby, or at least, with characteristic feminine guile, pretend to," he says. His own installation, tended by his understanding wife during his absence, consists of five tanks. They are all crowded into a tiny living room, where they create more interest than the furniture for which there would otherwise be room. He thinks that glass wool never had any use as a filter medium, amongst those aquarists who dislike itchy fingers and mysterious fish losses. Nylon wool is just the job, he thinks. As regards cover glasses, Mr. Holmes can't imagine that this survey will lead to any earth-shattering conclusion. He, himself, uses anodised aluminium clips. His only experience involving artificial gravel resulted in his requiring treatment for shock after he had calculated the cost of using it to set up a small tank. He asks if any reader can, in confidence, let him know of the location of a beach where it may be dug. In closing, Mr. Holmes wishes me and my fellow countrymen a peaceful new year, and hopes that, for me, there will be a continuing lively response to the points raised in my column.

Cpl. B. Slater is based at R.A.F. Dishforth, Thirsk, Yorks., and he writes after thinking about it for many months, about plants bought by post. He has bought plants twice by post and twice he has been surprised and pleased with the plants which he received. One lot came from a large, regal firm, and the other from a smaller firm whose name Cpl. Slater has forgotten, but in each case, the quality and variety of plants received was way above what he expected for the price. The fish which he has had most trouble in catching is the Malayan angel, *Monodactylus argenteus*. It has the ability, due to its shape, to escape the net and force itself into the tiniest of hiding places, normally resulting in damage to the scales, and, in several cases,

death, due to shock. He has a shoal of these fish—nine in all—in a 3 ft. tank, and they are really a beautiful sight. The water is fresh, with no salt added. Cpl. Slater's local dealer seems to be getting a greater variety of smaller fish in stock, but as far as he can see, the quality does not seem to be getting worse. Personally, he finds that he is buying bigger species of fish, and his interest in the smaller ones is decreasing. The larger species seem to be more graceful, and more interesting to watch.

He keeps his tanks in the living room and dining room. There is one community tank, 36 in. × 18 in. × 18 in., in the living room, and two 18 in. × 12 in. × 12 in. tanks containing guppy fry. In the dining room there is one 36 in. × 12 in. × 12 in. tank, containing the monos, and one 18 in. × 12 in. × 12 in. tank, containing a 3 in. piranha. Fortunately his wife is also interested in the hobby, so he gets few complaints. Cpl. Slater thinks that nylon wool has the advantage over glass wool, as it is easier to handle, and is more efficient in operation. He uses Perspex instead of glass to cover his tanks, and this is firmly bolted to the tank covers. It has to be removed to fit a new light bulb, but this does not happen very often. He has never used artificial gravel. One small "moan," which Cpl. Slater has about *The Aquarist* is that it does seem a little short of photographs, especially of new items of equipment. (I could, perhaps, say a few words about the latter, as I write a fair number of reviews for the magazine. Only a few firms are kind enough to supply items for review, and it means that reviewers such as myself have to buy the items which we want to review. We only do this, naturally, when the item is something which is quite cheap, or when it is a more expensive item which we really need for our own home set-up. Not being a professional photographer, and not having facilities to develop my own films, it proves rather expensive to buy a film for just a couple of shots, and then one has the added expense of having the film developed and having a couple of prints made; however, I know the value of a visual illustration, and will bear it in mind in future reviews.)

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Mr. T. B. Johnston lives at Wirral, Cheshire, and he has found, quite often, that plants from larger firms have been poor in quality, and badly packed, compared to the "smaller" men who grow their own. Mr. Johnston does not want to name names, but he has found excellent packing and plants from a dealer in Crewe, and another in London. He thinks that the reason may be that in their tanks, the plants are growing until they are despatched. The hardest fish, which Mr. Johnston has had to catch, apart from over eager zebras or bloodfins, was an African jewelfish. It was a youngster, released in error, into a 36 in. community tank. The fish was less than 1 in. long, but it nipped nearly every fish in the tank. Mr. Johnston spent

four hours one evening, and his wife spent three hours the next day, before the fish was caught. It was months before the aquarium—and the aquarist—were back to normal. With the exception of zebras, which Mr. Johnston thinks have been declining for years, the quality of smaller tropicals seems to be higher in the more reputable dealers. He keeps his aquaria in various places. He has three in the dining room, one in the living room, and one in the hall. He has had ten, at one time, in a spare bedroom, and eight, for plant growing, in his greenhouse. Any one could be commissioned for plants or fish, at fairly short notice. With space heating, the aquaria do help to raise the humidity level in the home. Mr. Johnston says that one doesn't see much glass wool about these days, and he states that nylon wool doesn't irritate the fingers as glass wool can. Mr. Johnston has used many means of supporting cover glasses, but he thinks that stainless steel clips, on the rear inside edge, with tank dividing tubing on the opposite edge, is best. The glass slopes from front top edge, to rear edge, and most condensation runs back into the tank. With three feet tanks he uses glass in three sections, for ease in feeding. As regards artificial gravel, and all other artificial decorations, he thinks that they should be kept out of the tank. He used such gravel once, in a goldfish bowl, and within a month, the gravel was just white marble chips. He doesn't know where the colour went to, but the fish survived to go into a large tank, and lived for years. Mr. Johnston has seen tanks decorated with coloured gravel, but they have been changed to normal gravel, before six months have elapsed. He says that the colour may blend in with the room's curtains or carpets, but he asks if we are after a natural looking aquarium, or an artificial one! "Plenty of contrast can be had with normal plants, rocks and gravel. Let's keep it that way," he says, in closing.

A Warning

I HAD INTENDED to write a bit about my own views on the questions posed, but my mind has been changed by a rather nasty accident—occasioned by my interest in aquaria. On Christmas Eve, I decided to reglaze an old tank which had one cracked glass panel. In trying to remove the broken glass, my left hand slipped, and my left wrist was very badly cut. I severed a number of important nerves, tendons and blood vessels, only missing, by a fraction of an inch, the main artery. A two and a half hour operation, without a general anaesthetic (for medical reasons), was necessary to try to join up the severed connections, and to say that it was painful is being optimistic to a degree. Many of my plans, for a merry Christmas, have had to be cancelled, and after an agonising night, with no sleep, I feel qualified to warn my aquarist friends to take great care with broken glass. It could be lethal! A split

second and I was without the use of one hand. I can but hope that movement of my fingers, and my sense of touch may return, in time. Such accidents only happen to other people—or so I had thought previously; friends, they don't! I've shown that! I may sound like a typical pedagogue, but I have good reason for my warning. I'll end now, as I have been typing this last few dozen lines with one hand, and it's quite a strain. I hope that Mr. Perkins will be able to read my rather erratic typing. Perhaps, by the time I come to type next month's article, I'll be able to make some use of my left hand again. Until then I'll leave you with a few more questions, and make a one-handed attack on my Christmas dinner.

TORTOISES, TERRAPINS AND TURTLES

Extract from the *British Medical Journal*, London.

Any discussion of the occurrence of *Salmonella* spp. in reptiles is likely to be confused by popular nomenclature. The terrestrial vegetarians (*Testudo* spp.) which we in Britain call tortoises are "turtles" in the U.S.A., while the aquatic carnivores (*Emys*, *Pseudemys*), often called water tortoises, are now commonly known as terrapins in both countries. Both are kept as pets, and both have been responsible for salmonella infections in man. About 85 per cent of imported tortoises harbour salmonellas in their bowels, and the figure for terrapins is not much lower but varies more between one batch and another.

Tortoises are caught wild in Morocco or Yugoslavia. They are naturally coprophagic, and once infected they may harbour the organisms for years without suffering any apparent ill-health. Most of the terrapins which reach the trade have been reared artificially in terrapin farms in the southern U.S.A., where they are fed on meat offal of all kinds, some of which has been shown to contain salmonellas. When awaiting sale in Britain they get scraps of meat and meal worms. How long the terrapins can harbour the organisms no one seems to know.

The danger to man from these sources cannot amount to much. We do not know how many terrapins are sold in Britain, but a few years ago it was calculated that 300,000 tortoises were imported each year. In contrast to this the total number of reported human infections derived from these reptiles in all parts of the world amounts to perhaps 100 from terrapins and less than 50 from tortoises. It is, however, characteristic of infections from both sources that they have been mostly

Let's have your opinions on the following:—

- (1) What is the best outside filter, costing up to about 30s. 0d., for a tank of about 30 in.?
- (2) Where did you get the rocks with which you have decorated your aquarium?
- (3) Have you had any experiences of using wood, from trees, as decorations in aquaria?
- (4) Experiences, please, on the breeding of angel fish.
- (5) Have you had any experiences of raising plants or fishes in greenhouse tanks?
- (6) What dried foods do you use for baby fish?
- (7) What new item of equipment would you like to see marketed for the aquarist?
- (8) What do you think of air operated aquarium cleaners?
- (9) What is your favourite floating plant, and why?

of young children, as in a case recently reported from Doncaster.¹

Tortoises are not cuddly, but the inquisitive child who explores their anatomy in detail is liable to pick up some salmonellas on his fingers. Furthermore, the tortoise who basks on the lawn is likely to leave his faeces there and a child may mistake one for a liquorice all-sort. The danger from terrapins may be greater. Most are kept in aquaria indoors, and if the animals happen to be infected the water will be contaminated. No one is likely to drink aquarium water except, perhaps, dogs and other pets; but it must be changed from time to time, and the obvious place for its disposal is the kitchen sink. He is a handy man who can do this without splashing, and he would certainly contaminate his hands.

Though the danger to health from these animals is a minor one, children must be protected as far as possible from the consequences of their own foolishness. There are reasons for forbidding the importation of tortoises, but these are based on arguments for the preservation of wild life rather than on health: in parts of Yugoslavia *T. hermanni* has become rare. Similar arguments cannot be advanced for terrapins since they are bred for the trade. It might be possible to treat all animals with an antibiotic before sale, but the cost would be high and, from the experience of a few trials, the outcome unsatisfactory. It is probably wiser to make it generally known that these animals are a potential source of disease; that they should not be handled more than is necessary; and that anyone who handles them should wash his hands. The aquarium water should not be brought into the kitchen but emptied down the lavatory or an outside drain. There is, however, little need to cry "wolf." Our dogs and cats share our lives far more intimately than do these reptiles, and at least 1 per cent of them are carriers of salmonellas.²

¹ Jephcott, A. E., Martin, D. R., and Stalker, R., *Journal of Hygiene*, 1969, 67, 505.
² Cruickshank, J. C., and Smith, H. W., *British Medical Journal*, 1949, 2, 1254.

The Care and Breeding of

Nannochromis dimidiatus

By Steve Foster

THE CONGO DWARF cichlid, *Nannochromis dimidiatus*, has been available to aquarists in Britain for about two years. Unfortunately it is a fish which is not readily obtainable outside of London where, in fact, I obtained two adult pairs.

Until I became used to the slightly starved appearance of the males, I was constantly wondering whether or not they would last another day. This species is reminiscent of the other more common African dwarf cichlid, *Pelmatachromis kribensis*, in body-shape. Also, like the *Kribensis*, it has no popular name and one of the most trying things encountered in keeping these fish is using its fairly large name.

Both pairs settled down in their new homes quite quickly but one of the first things one learns about these fish is that they are very shy and retiring until their surroundings are exactly to their liking. During the first week I had them they were only seen to full advantage when being fed. They quickly lose their shyness in a community tank but pairs kept alone in breeding tanks keep well hidden for the first few days.

Although it could not be said that the reference books are full of information on this fish, most of them agree the *Dimidiatus* require privacy for spawning and prefer to use a site which is fairly dark.

Two 18 in. x 10 in. x 10 in. tanks were used, heavily planted with wisteria, *elodea* and Indian fern with illumination supplied from a 40 watt lamp. As one reference book had put forward the opinion that, in nature, this species digs out mud or sand from beneath rocks in preparation of a spawning site, the tanks were furnished with large flowerpot sections embedded into a high gravel bank, in addition to the usual upturned notched flowerpot.

As soon as the fish were placed in their furnished tanks, both pairs immediately disappeared into the flowerpots and during the first week of their occupation very little was seen of them, except when they came out to gulp down some *daphnia*.

At the end of this week I was well acquainted with two dislikes of these fish, namely dried food and strong overhead lighting. To take the lighting problem first, I had noticed that the fish swam about freely when the tank lighting was not on, and illumination came from the fish-room lighting. As the fish-room has no windows I could not rely on natural light but changing the tank lighting from 40 watts to 15 watts gave a continuous "early dawn" effect and this level of illumination made the fish much more relaxed. To me the tanks looked rather gloomy but to their occupants it was, dare I say it, the difference between night and day. Both pairs immediately became much more active and from then on they could be seen swimming in and out of the flowerpots or digging under the flowerpot sections, at most times.

Live foods were taken with relish but only after two or three days of fasting would the *Dimidiatus* even look at dried flake foods. *Daphnia*, *tubifex* worms, white worms and crushed earthworm were rapidly disposed of but I was still trying to wean them onto some form of artificial food in case any emergency should occur causing the non-availability of live foods. Five different varieties of flake and powder foods were completely ignored and I quickly became fed up having to syphon off this food from the gravel before it caused contamination. Freeze-dried foods, which were supposed to adhere to the side of the tank but rarely stuck for more than a few minutes before floating to the surface, did raise some interest from the fish but as soon as it reached the surface they seemed reluctant

to follow it. The Little Miracle device for feeding freeze-dried foods, provided the answer. A cube of freeze-dried *tubifex* was placed in the little feeding bell (it retails at 9d.) and lowered into the water; both pairs, after initial suspicion of this bright blue intruder, realised what it contained and the worms were taken from both the side and underneath.

Now that the problems of lighting and feeding had been overcome both pairs took on a look of well-being. As the fish had been adult when purchased, there was little, if any, physical growth but the intensity of their colours increased. The belly of the males became a deep violet which changed into a blue-grey colour on their backs. The back at times, also showed a mottled pattern and both dorsal and tail fins were touched with orange. The females' colouring was similar but not so defined and they had a rib of light blue running along the top of the dorsal fin which was not evident in the males.

One of the females increased in girth until she took on the appearance of having swallowed a grape; both she and her mate were spending more and more time examining the flowerpot sections. Later that day excavations were started beneath one of the sections and initially both fish picked up small pieces of gravel and then spat them out in a small neat pile. However, as the space below the section increased, the male took over the digging duties and in addition to using his mouth he pushed the gravel aside with his body. This digging continued with lessening enthusiasm for the rest of that day and the following morning.

The pair spawned sometime during that afternoon, the eggs being placed on the underside of the flowerpot sections. Twenty-four hours later the eggs were showing signs of fungus and by evening the parents had eaten them. As all the eggs had fungused at approximately the same time it was presumed that either the male was infertile or he had not fertilised the spawning.

Within three weeks both females had taken on a rotund appearance and my hopes were high for more spawnings in the near future. A month later the females were still exactly the same and the males had started no new excavations. I tested the water in both tanks for pH and hardness with results of neutrality and 120 p.p.m. The water was clear and did not give off odour; the plants, apart from being a bit scraggy due to the lack of illumination, were doing as well as could be expected. Although nothing unusual had been found I played safe and carried out partial water changes over the next few days but there were still no spawnings. The fish were eating well, looked to be in excellent condition and seemed to be enjoying life but did not show any interest in propagating the family line.

This state of affairs carried on for another fortnight with still no signs of spawnings or even mating behaviour.

At this time I visited London again and on my usual rounds of the Aquatic stores I visited a shop in West London. As I was a bit short of time, I had a quick look at all the show tanks, mentally noting those which deserved further examination. In one of the tanks where there were several specimens of *Nannochromis dimidiatus* and *Nannochromis nudiceps* and I purchased a pair of the latter. Just as I was about to take my leave, I noticed a smaller tank beneath the one from which my fish had been taken. It was a beautifully furnished 24 in. x 15 in. x 12 in., with a variety of plants, fancy rockwork etc, but in the middle of the tank there was a coconut, still decorated with its husk. I have used half coconut shells for spawning dwarf cichlids but this one was complete except for a small hole at one end. As far as I could see there were no fish in the tank and I began to ponder on its purpose. I was about to ask the proprietor when a snout was stuck out from the coconut, to be followed by the rest of the fish which proved to be a magnificent male *Dimidiatus*. Seconds later his mate appeared, swum back into the coconut and then reappeared. I took a closer look, thought I was imagining things, but sure enough around her tail a dozen tiny fry were darting about. As I moved to get into a better viewing position my shadow fell across the tank and mother and family disappeared.

As time, tide and BEA wait for no man, I did not have time to discuss this unusual breeding site with the proprietor but he, at least, confirmed that this pair had spawned more than once in this fashion.

The following Saturday I visited our local supermarket and bought two coconuts complete with husks. On returning home my wife enquired what the coconuts were for and when I, unthinkingly, said I was going to put them into the breeding tanks she asked me if I was sure they were a pair!!! Apart from enduring sarcastic witticisms from my better half, my immediate problem was how to remove the fleshy part of the coconut without having to make too big a hole. This proved to be impossible and both shells ended up with fairly large openings at one end.

I was unsure whether or not the shells and husks would contain any unwanted bacteria, however I took no chances and poured boiling water over them after which I immersed them for 24 hours in a bucket of water to which two Halamid tablets were added. At the end of this period the bucket was placed under a cold water tap and rinsed for about an hour.

Before placing the shells in the tanks, I added to each a handful of washed gravel to counteract any buoyancy. Once in the tanks the shells were inspected by both pairs who took up residence almost immediately.

The following day I noticed that one pair were swimming in and out of the coconut shell and dropping pieces of the gravel, used for anchoring purposes, in a pile outside the shell entrance. This excavation

continued throughout the evening and was still under way when the fish room lights were extinguished at 11 p.m. At feeding time the next morning the pair had again commenced their removal operations.

On returning from work, the fish-room was my first stop and I noticed that in both fish their colours had deepened. The male now radiated a variety of colours ranging from orange on his belly to a light blue in his dorsal fin, the latter being speckled with various colour hues. The female who, when filled with eggs showed a cherry red colour on her belly, had turned a deep blue red colour.

Later that evening both fish were seen swimming in and out of the coconut shell at regular intervals, but without depositing any more gravel and when two hours later the female would not allow the male to enter I presumed that spawning had taken place.

The one drawback of using whole coconut shells is that, unlike flowerpots laid on their side or even upturned flowerpots which can be lifted, it is impossible to see what is going on inside without the sort of disturbance which would make even the most tolerant of cichlids eat the spawning. The next day I got a glimpse of the female when she ventured out of the shell to feed and as she had a new "5lb slimmer" look I was sure that spawning had taken place.

A week passed and no signs of any hatching was seen and after another few days had gone by and still no indications of a family appeared I concluded either the eggs had fungused again, indicating a sterile parent, or that the spawning had been eaten.

Meanwhile the other pair steadfastly refused to spawn and due to other commitments for the tank, were removed and placed in a community tank where they settled down quickly in the company of other dwarf cichlids.

The remaining pair continued to flourish and the female again filled with eggs, but as had happened previously there was a complete lack of either site preparation or mating behaviour. The reason for this was discovered purely by accident, when carrying out general maintenance on the tank. To ensure that I was syphoning all the detritus from the gravel, I removed the coconut shell and before replacing it in the tank I rinsed it in clean water and refilled it with gravel. An hour later both fish were removing the gravel bit by bit. It would seem that this species prefer to excavate the spawning site each time breeding takes place. Only when I realised this did I look closely at each of the three flowerpot sections to find that they had been cleared of gravel sometime previously.

As the coconut shell had been excavated for the last spawning this left no suitable site under which the fish could dig. Although all *Dimidiatus* may not breed in the same way I soon realised that if my pair could not carry out their excavations prior to the spawning there would be no spawning.

The recesses beneath the flowerpot sections were repacked with gravel and on his next excursion from the flowerpot the male immediately went on a tour of inspection. He seemed especially interested in one of the flowerpot sections which was almost totally hidden from view by plant growth. Next day I spent five minutes peering into the tank without catching a glimpse of either fish; tapping the coconut shell with an algae scraper normally had the pair swimming out in double quick time, but it produced no results on this occasion. I then looked into the tank from the top, half expecting to find two corpses in the mass of floating Indian fern which covered the surface of the tank. I didn't see any bodies but I did see a flash of a brightly coloured tail from beneath the well hidden flowerpot section. Getting myself into some, till then unknown, yoga positions, I could see, with the aid of a torch, the female in an upside down position fanning her latest clutch of eggs. But more important was the fact that, although the spawning was not large, the eggs had not fungused.

The male stood guard, well hidden in the plants, a few inches from the section but not wishing to disturb them further I decided to make no further examinations until the following morning. At this time I again used a torch to examine the spawning site; the eggs still had no indication of fungusing and this time I was able to confirm that they were fertile as small eye spots indicated the development of the fry.

The fry hatched on the fourth day after spawning and were free-swimming in a further five days. Their first meal consisted of newly hatched brine shrimp and although the shrimp was consumed until their bellies looked like an overtight pink drumskin, unlike their parents, they also took to prepared foods quite easily.

In the dim light of the tank, it was rather difficult to determine any particular markings but the tones of the body showed changes around the 20 day old stage. The fry developed quickly and at the age of a month they were separated from their parents and placed in a 24 in. x 12 in. x 12 in. raising tank. The next morning approximately half of them were dead; whether the water chemistry had been different or they had not been properly handled I do not know. The temperatures of both tanks had been equal but the water was fairly fresh having only stood for two days and as the breeding tank was well established this may have been the cause of the trouble.

The remainder of the fry continued to grow well and were miniatures of their parents at the age of ten weeks.

The parents spawned again, this time in the coconut shell and again the fry were raised fairly easily. The broods on both occasions numbered between 30 and 40 at hatching and at three months numbered 14 and 25 respectively.

New 14,000-Acre Recreation Centre for the Cotswolds

A WATER PARK covering 14,000 acres in the Cotswolds between Cirencester and Swindon may be developed to provide a vast, new recreational centre. Gloucestershire and Wiltshire County Councils have prepared a draft master plan to develop worked out gravel pits as lakes for water sports, fishing and for naturalists. The plan is intended for public comment at this stage.

The Cotswold Water Park could become one of the largest concentrations of open water lakes in the country to serve a region of two million people who now live within an hour's journey. Later, when the M.4 and M.5 motorways are built, the Park will also be within easy reach of London and the Midlands.

Already, pits created by gravel extraction extend for some 900 acres and most are used for water sports. As further areas of gravel are worked, more lakes will be created. Planning permissions have been granted for gravel to be extracted from an additional 1,500 acres and another 500 acres may also be released, so that by 1981 wet pits will cover about 3,000 acres. Ultimately, if the gravel reserves of the whole area between Poole Keynes and Lechlade are worked, a continuous series of lakes extending for over 12 miles will be formed.

While there is every indication that the present rate of gravel production will increase in the future, the future of the Cotswold Water Park will also depend on the development of new roads to cope with increased traffic. By-passes for both Fairford and Lechlade are planned, while the two County Councils also intend to build a new spine road running from north-east to south-west across the western part of the Water Park to give better access to the lakes both for gravel and tourist traffic.

A joint committee to maintain and develop the Cotswold Water Park has been set up by Gloucestershire and Wiltshire County Councils and Cirencester and Cricklade and Wootton Bassett Rural District Councils. The draft master plan indicates the areas where gravel workings may take place in the future and to what recreational use the areas could later be put. Special attention has been paid to the need to cater for all interests and to work out a satisfactory solution to the conflicting demands of the various users of the Water Park.

The Cotswold Water Park will consist of two sections based on gravel workings around Ashton Keynes in the west and Fairford in the east. Two areas, one in each section of the Park, have been proposed as country parks and the Countryside Commission have been asked for financial support to acquire the land.

The existing lakes are well used at present with sailing, hydroplaning, motorboating, rowing, sailing and water skiing the main sports, while naturalists and anglers are active on most pits, too. But there is some conflict of activity between these interests; while some pits are over-used, others are used hardly at all. The draft master plan puts forward proposals to bring these pits into use as soon as possible and seeks to resolve user conflicts; it also looks at the possible long-term uses for the lakes within the Water Park as a whole.

The Nature Conservancy and the Naturalists Trusts of Wiltshire and Gloucestershire helped in the preparation of the draft master plan and suggested how wildlife could be protected and developed in the Water Park. The draft master plan recommends that a number of pits should be reserved exclusively for wildlife. The Water Park could well provide important inland sanctuaries for water fowl.

There should be a careful segregation of activities in the Water Park, the Plan suggests. At least one or more educational nature reserves and, eventually, a field studies centre could be established. Public interest in natural history could also be catered for in the Cotswold Water Park by providing nature trails, information centres and pictorial information boards. The report suggests that different groups of pits could be given a special identity associated with some geographical feature nearby.

The Somerford Lakes, which are already developed as private nature and fishing reserves, could be re-grouped on the north side of the proposed spine road to improve sailing facilities, while two of the pits could become nature reserves. An aquatic mammal reserve and zoo could be set up on the Isis Lakes, where a protected habitat could be provided for fresh water mammals, which are in danger of extinction. This would be a great opportunity to establish an aquatic wildlife centre unique in this country.

Keynes Park, a country park of 228 acres for which the Countryside Commission have already indicated their support, could become a centre for active recreation including sailing with sub-aqua and water skiing activities. The draft master plan also suggests that Ashton Ponds could become an ideal nature reserve.

To the south of South Cerney lie the largest existing lakes on which most recreation now takes place. One of these lakes is gradually being extended and this could provide a setting for future development enabling South Cerney to become a lake-side village. At

Continued on page 376

OUR READERS WRITE

Four Survivors—Cold Comfort

I had the unfortunate experience of losing over 150 fish during the Christmas holidays. I have a pre-payment meter and before leaving I put over a pound in for six days (normally I put in 10s. a week). Due to the extreme cold and lack of house heating, the heaters (11 in all) must have been on continuously. I had left a key for someone to come in and check but was let down. On my return home, supply was off and on inserting 2s. an awful sight of dead fish greeted me. Temperatures in my glass tanks were about 50°F and in my hiyware plastic about 40°F. I assume room temperature must have been about the same as water in plastic tanks.

I had lost adult Swords of several varieties plus many young of saleable size. Adult Angels, Pearl Gouramis, Black Red-tailed Sharks, Bronze Cats, Platies and numerous Delta-tailed Guppies. Being rather upset and shocked I did nothing at first but after about an hour I noticed movement in a 36 in. glass tank and was surprised to see two Rosy Barbs moving but unable to stabilize themselves. I immediately poured a couple of kettles of hot water in the tank and after I had removed the dead inmates, they slowly recovered.

I had also noticed in one of my plastic tanks a Peppered Catfish right way up. I had assumed it had died in this position but after the Rosy Barbs had stirred, I put a kettle of hot water in this tank also. The Catfish seemed alright, so I transferred it into the tank with the two Barbs. Imagine my surprise when I saw in the lower 36 in. tank (temperature now 56°F) amongst all the dead young swords, one orange sword about 1½ in. swimming upside down. I tried the kettle trick again and eventually transferred this one to the survivors' tank.

These four were the only survivors, apart from two Western painted turtles who had looked frozen stiff at first sight. I can only add that after a week now all live stock appear to be fit and well. After my initial anger and dismay, now I see these four fish, the sole occupants of a large tank, I feel rather proud of them.

I would be very interested to hear of any readers who have experienced fish surviving at such low temperatures.

D. A. BOULDING,
Bolton, Lancs.

Firemouth: Convict Cross

I was very interested to read about the cross within the *Cichlosoma* genus between Meeki and *Nigrofasiatum*. I find it very surprising that the Firemouth should prefer a Convict to one of her own kind.

It will be interesting to know if the young prove fertile.

I hope Mr. Dawson spawns these two fishes again. This time he may be lucky enough to have more fry survive.

G. W. DOWNE,
London, E.17.

Has Anyone Seen Jacko?

Eight weeks ago our Aquatic Nursery was the scene of three burglaries. The first was the till (a few pounds)—my fault for leaving it there. This took place one Thursday night quite late. The second was at 1.30 p.m. on a Sunday while I had gone home to lunch. Cash again was taken. It just did not occur to me to empty the till during the lunch hour. However, number three took place late on a Saturday evening. By this time I had learned not to leave money in the till, and so the intruders almost emptied the shop of aquariums, air-pumps, heaters, etc. This was bad enough but worse was the fact that our pet Cockatoo was stolen.

This bird was the pet of our daughters Susan, who is eleven, and Jayne, who is nine. He was the star of the pets' corner which Susan and Jayne look after. We organised this for the amusement of Susan and Jayne and also our customers' children. Susan and Jayne being rather enterprising, usually charged the children 3d. to see the animals—rabbits, guinea-pigs, mice, hamsters and other small mammals. They also keep a few reptiles.

The pets' corner is very empty without Jacko, and every morning when we feed the animals, Susan and Jayne ask, "Daddy, do you think we will ever get Jacko back." At first I was pretty optimistic but now I feel we shall never see him again unless we enlist the help of someone like yourselves. We have passed the tears stage, but feel that we ought to take some action to recover him. The police have done everything they can to get him back for the girls, but just



have no lead as to his whereabouts. Can you do anything to help. I have already informed the local shopkeepers and animal dealers but to no avail. I believe we must seek farther afield.

Jacko is a greater Sulphur-crested Cockatoo. All white with a yellow crest on his head. He talks very plain and repeats Jacko and hello incessantly. His other phrases he repeats less often. Hella Ada—Dave—John—whotcha Jack—and goodnight being a few of them.

When approached he nearly always puts his head down to be scratched and he spends a lot of time knocking his beak against his cage. He has a slight limp due to a corn. If anyone knows of his whereabouts and it leads to his recovery we are offering a £10 reward. This is all we can afford after losing so much.

Just prior to Christmas Susan and Jayne were heard to remark that if only we could get Jacko back for Christmas other gifts would not be important.

D. B. BARKER,
Honeysome Aquatic Nursery,
Chatteris, Cambridge.

B.A.F.

On reading your article on the British Aquarists' Festival you state that a Gourami died because it was placed in a tank which was apparently too small for it and that exhibitors should specify the size of tank appropriate for the size of fish.

I would like to draw your attention to the fact that it was my Gourami that died and on reaching Belle Vue on Friday, 17th October, I was told that my fish had died on arrival. When I went over to the Champion of Champions' stall, I was shown the tank which was for my Gourami and it was not the size of tank I had ordered.

On the entry form I specified that my fish was 19 in. and I would require a 36 in. × 18 in. × 15 in. tank and the tank I got was about 30 in. × 12 in. × 12 in.

I, myself, then thought that my fish would have definitely been too big for that size of tank.

So the fault, therefore, does not lie with the exhibitors but with whoever deals with the laying out of tanks for the Champion of Champions.

JOHN LANGAN.

Cavitation

I feel I ought to point out a minor error in Mr. Lorant's article in the December issue of *The Aquarist*.

Cavitation is a phenomenon, well known in fluid dynamics, which occurs in water when the local pressure falls below the vapour pressure of water. This could happen in the wake of a rapidly moving object. What effectively happens is that the water "boils" locally, forming bubbles of water vapour. (The boiling temperature of water is a function of the pressure.)

These bubbles of vapour are unstable and collapse as soon as they reach a zone of higher pressure.

Therefore, the cavities Mr. Lorant mentions are not vacua, but bubbles of water vapour. However, this does not invalidate the "cavitation clicks" observed.

P. A. DAVIES, B.S.C.

Trace Elements

I was interested in the article "a commercial breeder's notes on guppies" by Mr. F. L. Vanderplank, in the January issue of *The Aquarist*.

I feel sure there must be many readers, including myself who would like further information as to exactly what trace elements Mr. Vanderplank introduces into the water of his breeding tanks and in what proportion they are used.

Perhaps, at some future date, Mr. Vanderplank might be persuaded to enlarge a little on this subject.

ERIC HOBSON.

Red Oscars

Two seven-inch specimens of *Astronotus ocellatus* (red variety) can be viewed between 9.30 a.m. and 4.30 p.m., Monday to Friday, at:

The Waterman School of Hairdressing Ltd.,
85 Charlotte Street,
London, W.1.

These fish are valued at about £50 each and it is believed that there are only four of them in this country.

Fish-house Heating

Regarding the letter from P. J. Shepherd published on page 299 of the current issue of *The Aquarist*,

he says he is interested in the results of "fan storage heating" in fish houses. I have for about six months or so used a fan heater in my 40 tank fish house.

My first house is brick built, insulated with $\frac{1}{2}$ inch insulation board, measures 8 ft. by 9 ft. and is 7 ft. high at the highest. The heater is a 2 kW conventional fan heater operated by a wall thermostat.

The main problems were that floor level tanks were much lower in temperature than the mid and high level tanks and the power supply was not able to supply more power than that used by the fan heater.

To solve these problems I simply put heaters and thermostats in all the tanks which did not keep warm enough and wired all these to the "off" position of the main thermostat. This means that when the fan heater is off the tank heaters can operate.

The best temperature I find to set the fan heater stat. at is 80°F, this gives a varied result in the majority of tanks of between 74° and 78°F. which I find perfectly adequate for all my requirements, i.e. breeding mainly livebearers.

If you feel this would be of help perhaps you will kindly forward this letter to Mr. Shepherd as I am willing to supply any other information, if I can, which I may have omitted.

D. E. HAINES,
9 Coppice Rise,
Harrogate, Yorkshire.

Encounter with an Eyed-Lizard

While walking along the sea front in Estepona, Costa del Sol, Spain, one day in December last, after several days of heavy rain which had filled the usually dry river bed with torrents of water; I noticed a fisherman coming away from the beach dangling a large lizard by its tail. I asked him if it was alive and he said "Yes"; so I then said "What are you going to do with it?" He replied "Eat it." I quickly felt in my trouser pocket and offered all the change I had (about one shilling and sixpence), and he handed me over the lizard with a smile warning me to take care as it would bite me. It was too far gone, cold and half-drowned, to resist and I was able to examine this fine pale green creature sequinned with tiny black spots with two rows of deep blue spots on either sides. It was about 20 inches long, and would have been longer had not its tail at one time been broken off and had not reached its full length.

Evidently the heavy rains had washed it down from where it had been hibernating in the mountains right to the river mouth where it had either crawled ashore or been fished from the water. Once home I quickly constructed a vivarium for it and in a couple of days it was full of life. Unfortunately insect food was difficult to find in December, and it should have been in

hibernation; so I decided to take it back into the mountains and there I set it free among the rocks where it quickly disappeared.

GUY B. TAPPENDEN,
Estepona, Malaga, Spain.

Marine Fishkeeping

As a keen novice marine aquarist, I was very interested in Graham F. Cox's article "Filtration in the Marine Aquarium" in the January 1970 issue of *The Aquarist*.

However, I was rather surprised by Mr. Cox's statement that he would not keep more than two $\frac{3}{4}$ in. *Amphiprion* sps. in a 10-gallon aquarium.

At the time of writing I have an 8-gallon plastic tank containing the following fish—1 $\frac{1}{2}$ in. *A. percula*, 1 $\frac{1}{2}$ in. *A. polymnus*, 2 $\frac{1}{2}$ in. *A. ephippium*, 1 $\frac{1}{2}$ in. *D. reticulatus* and a 2 in. *Abudefduf taeniarus*.

Whilst admitting that the above population would not allow any degree of fish growth, I can only add that all of the above fish are in perfect condition and have healthy appetites. The last fish was introduced to the tank about a month ago.

I use an old base plate undergravel filter modified with an home-made diffuser air chamber, operated by a Super Rena vibrator pump. This arrangement gives a really fierce water turnover together with valuable aeration.

The synthetic seawater has been in the tank for 5 months without water changes being made.

Although I bow to Mr. Cox's much greater knowledge and experience, I do feel that coral fishes such as clowns and damsels are not very demanding in their space requirements. Both clowns and damsels do not venture far from their anemones or coral heads in nature.

Finally, I wholeheartedly endorse Mr. Cox's remarks that high power undergravel filtration will revolutionise marine fishkeeping making this section of the hobby as popular and easy as freshwater fishkeeping is today.

Indeed, the above mentioned marine tank requires less maintenance than my freshwater tanks.

S. G. WORDLE,
Bentley, Walsall, Staffs.

Product Review

DR. AXELROD'S "ALGI-FLAKES" and "Shrimpliflakes", are marketed by Miracle Plastics Corp., of Jersey City, U.S.A., price 5s. 9d. per 1 oz. clear plastic container.

Although these two foods have been on the American market for some time, I have only recently seen them on sale locally. Both foods are in flake form—very large flakes, most of them, some being as big as a half crown piece. For this reason, I found it necessary

to crush the flakes for all but the largest fish. I tried some of the flakes, straight from the drum, with some of my smaller tropicals, but the flakes were so large that the fish stayed away from them. The flakes were popular with smaller fish when they had been crushed into small pieces. The flakes sank in the water fairly quickly, and the fish had to be speedy to trap them before they reached the base of the aquarium.

The "Shrimpfakes" are recommended for live-bearers, characins, barbs and cichlids, as well as others, and only as much as can be eaten in three minutes should be fed at one time. This food contains freeze-dried brine shrimp, freeze-dried tubifex, shrimp meal, fish eggs, fish liver, chlorella algae and yeast, collected from Germany, U.S.A., Taiwan and Japan, and is packed in the U.S.A. The analysis given is:—protein 45%, fat 5%, fibre 4%, ash 8% and water 8%.

The "Algi-flakes" are made specially for fish which

need a large percentage of vegetable protein in their diet e.g. mollies, guppies, platies, swordtails, goldfish, etc. It is also useful for fish such as tetras, barbs and cichlids which need vegetable material to encourage breeding. The food is made in Western Germany, and packed in the U.S.A. It contains chlorella algae, brine shrimp, fish meal, salmon egg meal, fish liver, yeast, spinach and alfalfa. The given analysis is:—protein 45%, fat 8%, ash 8%, fibre 4% and water 8%.

For added variety both of these foods can be recommended for addition to one's stock of special fish foods.

B.W.

(An interesting point about these foods, which are similar in price to many other fish foods, is that they would sell for £10,304 per ton, if my maths are correct. A few tons of these foods, and one would not need to work again. I wonder what the purchase tax on fish food is?)

OBITUARY

WILLIAM VORDERWINKLER

FEW MEN in their lifetime leave behind them a legacy that will remain for generations to come, but Bill Vorderwinkler was one of those few. His acumen in the field of aquatic life became a legend even in his own time. He was born in Austria at the turn of the century, and along with his coming of age, developed into the twentieth century fishkeeper. It was no surprise to those who knew him that he also developed an ability to translate material precisely, and at the same time on a plane understandable to all. Mr. Vorderwinkler had that rare ability to take even the most involved scientific monographs, and translate them into laymen's language.

As a youngster his family moved from Austria to the United States. It was only a matter of time that he became interested in fish. The devotion to perfecting techniques was one which got him to dig deep into the literature available to him. As a founding member of the Monmouth County Aquarium Society (later to become the New Jersey Aquarium Society Inc.) he served as its first President, and carried over his enthusiasm for things aquatic to all those who joined the Society. Bill then served his group on various committees, and in many successive executive positions. His writings became accurate treatises to rely on whenever you needed information. For the December 1952 issue of *N.J.A.S. Bulletin* he translated an article published in *Das Aquarium*, and left everyone clamouring for more. Thus he began his role as translator for the hobby.

In 1953 he undertook the job to translate three German books by the noted aquarists Julius Nachstedt

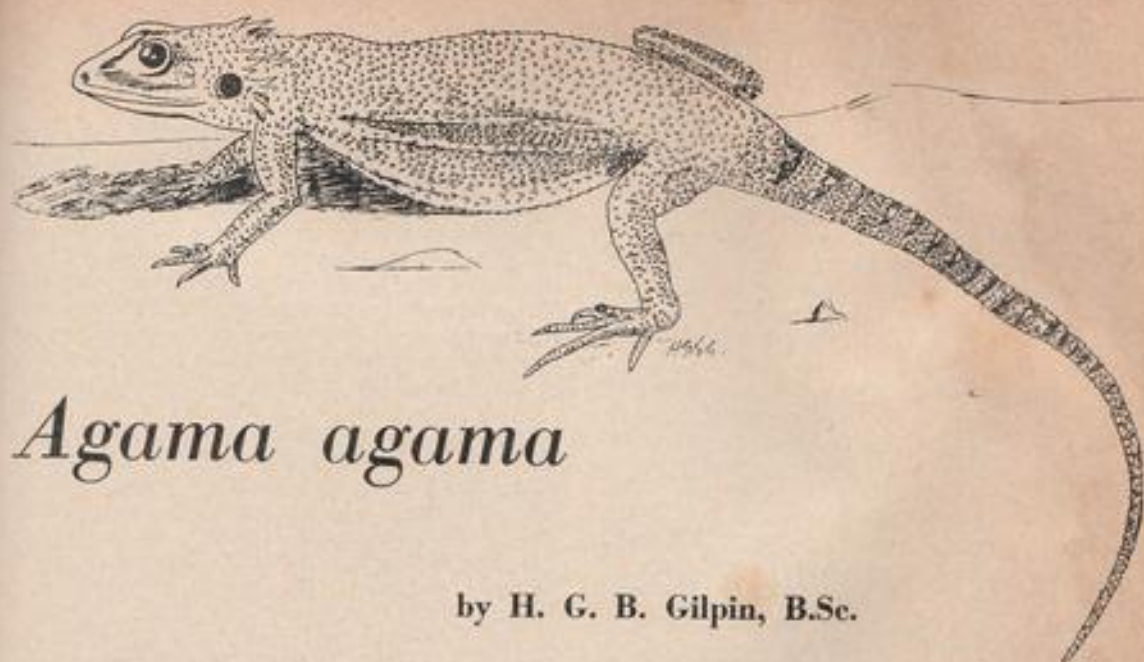
and Hans Tusche. The result was published by the Aquarium Stock Company, and became the standard work, for *Breeding Aquarium Fishes* was indeed a classic. Later in 1954 he left the realm of the hobbyist with the hopes of reaching a larger audience. Mr. Vorderwinkler joined Dr. Axelrod in producing *TFH* on which he served successively as the translation editor, editor, and publisher. Many books in the *TFH* line have either his name or his style bound between the covers. One of the first larger books (160 pages) *Color Guide to Tropical Fish* was the product of his research and understanding in the field.

When he suffered a stroke in 1967 it disabled him completely. To an active man this was something which left him greatly uncomfortable. Rather than be discouraged, he fought back, but to little avail. It was only a battle against time, and on 9 February, time took its toll. The editor of the *N.J.A.S. Bulletin* in 1952, Ollivette Steffans put it best, when she said:

"Let us not forget our friend Bill Vorderwinkler, the man that is so willing to share his knowledge of fish with us. He is always willing to speak on any subject. . . . So many, many thanks to our own Bill Vorderwinkler."

We extend our sympathies to the Vorderwinklers, and we will all remember a giant in his field especially whenever we see *Hemiodopsis vorderwinkleri* (Barred Hemiodus), and *Hemigrammus vorderwinkleri* (Vorderwinkler's Tetra) swim by.

NEAL TEITLER.



Agama agama

by H. G. B. Gilpin, B.Sc.

NEARLY TWO YEARS AGO I wrote to an advertiser asking him to send me a number of lizards. They arrived in due course packed in a cloth bag, a quarter filled with dry moss, enclosed in a cardboard carton. Amongst them was a female *Agama agama*, a member of a family containing some fifty species, forming the Old World counterparts to the Iguanas of the New World. They differ from these in the location of the teeth, those of the Agamas being fused to the crests of the jawbones, whilst in the Iguanas they arise from the sides of the jawbones.

Common Agamas are widely distributed in Africa, occurring in the bush, grasslands and clearings in forests. They also associate closely with man, living in shady village trees and invading the thatched roofs of native huts in large numbers.

About twelve inches long when mature, these lizards exhibit considerable variation in colour. In the day time the bodies and legs of dominant males are grey to blue in colour, the head being bright red and the tail banded with red or orange. Sometimes there is a white line down the back. The throat and underparts are yellow. At night when they congregate together in some sheltered retreat the males become uniformly dull brown. Weakly or subordinate males are dull brown all over.

The females, rather smaller than the males, are usually brown with a pale dorsal line or dark spots.

My specimen was a dull, greyish brown, blotched with darker brown with some yellow spots on the back. On arrival she had vermilion flashes behind the forelegs but these had disappeared by the following morning, reappearing and disappearing from time to time subsequently. The tail was banded with dark brown and rather more than one and a half times the head and body length.

The relative tail length of this species varies with age. In young specimens it is twice the head and body length but in older lizards it is proportionately shorter. In males of five inches head and body length, growth of the tail ceases.

The eyes of the Common *Agama* are prominent and the lids movable. The head is rounded and the mouth wide. The auditory hole is large and edged with spike shaped scales.

Under natural conditions these agamas eat a wide range of foods. Much of their diet consists of ants, both winged and wingless, but they also consume other insects. During dry seasons they eat large quantities of vegetable matter but the nutritional value of this is considered doubtful. In captivity they are gross feeders and care is necessary to prevent them from overeating, with possibly fatal results. My female, within three days of her arrival, was feeding freely on locust hoppers and gentles and later took bluebottles, woodlice and earthworms with

E. nuttallii was introduced to S.W. Westmorland by 1950. The true bulrush-sedge *Scirpus lacustris* grew in Knowsley Park lake since at least 1910, until first recorded in 1935, the misleading date quoted in the *Flora of S. Lancs.*

So far back as 1917, ribbon *Valisneria spiralis* was in Greenacres Mill Dam at Oldham and is now naturalised in Gloucestershire's Berkeley Canal between Purton and Shepherd's Patch, and waters warmed by industrial cooling water in Worcestershire, S.E. Yorkshire, and Lancashire's Reddish and Droylsden Canal. *Ludwigia palustris* may be native to ponds on Jersey and in the New Forest S.E. of Lyndhurst; but aquarists introduced it to canals around Oldham. Maybe there are waters somewhere with American *Elodea occidentalis* which German aquarists introduced to their waters seven years ago, or the South American duckweed *Lemna valdiviana* which was found growing wild at St. Biarritz in France in 1966.

Because it has more interest for botanists than aquarists, the submerged European *Hydrilla lithuanica* (synonym *verticillata*) has spread little since it was found among the naiad, *Najas flexus* in peat water in

Esthwaite Water in 1914. It was deliberately introduced to West Galway. It was not introduced by wildfowl, as is often claimed, for both this and the American club-rush *Schoenoplectus (Scirpus) americanus* near South Massam's Slack on Freshfield (Lancashire) dunes and St. Ouen's Pond, Jersey, as well as parts of Europe. The latter was certainly introduced at Freshfield, 1906-1909 and first collected there by the late W. G. Travis in 1909, who confused it with the narrow *Blysmus rufus* until R. E. Baker recorded it correctly in 1928. In the 1930's it was divided and replanted there by a botanical friend. It is in a spot of dune that was seashore 90 years ago. The American rush *Juncus tenuis*, first found in Lancashire at Bootle in 1903, had only 2 known stations in 1920, at least 18 by 1940 and continues to spread along canal banks, cart tracks, etc. But the northern rush *J. balticus*, has been almost exterminated by housing development on its southernmost British haunt discovered by Adamson in 1912 (not 1913 as quoted elsewhere), the Hillside-Birkdale dune-pools near Southport where golfing visitors from Scotland probably introduced its seed accidentally.

THE SKINS OF FISHES

By Henry Tegner

IN THE RECENT past the skins and scales of certain of our fishes were highly regarded as valuable commodities. Now man-made plastic has largely ousted the epidermis of the aquatic vertebrate from its many erstwhile useful spheres.

Shark-skin, known generally as shagreen, is still occasionally used in the manufacture of certain articles but to nothing like the same extent it once was. Shoes, saddlery, belts, cases, rasps and sword-handles were only some of the things made of shark-skin. Cabinet makers still use shark-skin files with which to finish off their finer pieces as these are considered to produce a cleaner job than even emery cloth. When men used swords with which to fight one another a good shagreen covered handle could prevent sword-slip from blood or sweat. Because of its coarse, somewhat granular structure, shark-skin takes a dye easily so that accoutrements made of this material were often gaily coloured affairs.

The minute scales of such small fish as bleak and sprats provided, at one time, the main ingredient for the manufacture of artificial pearls. The procedure was to strip the fish then grind the scales, after drying, into a fine powder. The powder was now washed in ammonia and dried again. The resultant product went by the romantic trade name of *L'Essence d'Orient*. The maker of false pearls injected this concoction into minute glass globes not unlike the miniature lamp-bulbs of our lesser electric

hand-torches. Once filled the glass globe was sealed and its exterior treated with the fumes of hydrofluoric acid so as to give it its necessary opalescent appearance. You may even now come across these old imitation gems in some antiquary, they are rare and nearly always yellowed with age and are of no intrinsic value.

The County Council roadman, who works our village highway and who was once a gardener, tells me he still wears, when the weather is damp, an eel-skin belt next to his skin. He says it keeps the lumbago at bay. The skins of eels, it is known, contain certain fats and these, in either a soothing or even a counter-irritant form, may well help to fend off the pains—provided always that one has the required faith in one's girdle to help combat this crippling affliction. It is not altogether easy to skin an eel. The know-how needs to be learnt. Nail the head of the dead eel to a board, cut right round the back of the head with a razor-blade, now grasp the body with a piece of rough sacking, where the skin will peel off like a glove—we hope.

Another modern use of fish-skin came only recently to my notice. A friend who is a coffee-fiend, he seems to dote on this eastern liquor, tells me that whenever he has a sole in the house he adds a piece of its skin in his percolator as this acts as a coagulant and when coming to the boil the sole-skin clears the beverage of all its grounds and impurities leaving a clear, dark, tasty liquid.

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WHICH?

By R. C. MILLS

DO YOU BREED FISH? When faced with this question, how many aquarists modestly admit to raising a few livebearers as "they're so easy," and rather give the impression that the egglayers are quite beyond them?

It may come as a pleasant surprise that the oviparous species are not so difficult as is generally believed. This is not to be a trial between the two factions and there will not be any clear-cut verdict in favour of either party but it may help to have some of the facts collected together so that the undecided (and perhaps some of the present believers) can choose which path to tread when confronted with this fork in the road.

First on the witness box—the livebearers.

Because of their natural promiscuity, the livebearers are usually the first species to breed in the community tank; or to be more precise, because of their size the fry are the first seen, and due to their being free-swimming at birth, are able to take evasive action and hide in the plants to avoid being eaten by larger fish.

This is the exciting beginning, and the novice aquarist may be well pleased with the occurrence. Here he has colourful, active fish that multiply regularly and are quite hardy, so he is not particularly worried about trying any other species, especially if any effort on his part is required!

Everything seems perfect, but there are one or two facts that the contented tyro may have overlooked, or not even be aware of.

As mentioned before, one reason for the popularity of livebearers is the ease with which they multiply, and herein lies the danger; because they are so broad-minded (the livebearer tank being better than a French film at times), it is very difficult to maintain a particular colour strain and, more important, the quality of the strain. Just as you have complimented yourself on a beautiful brood of young fish, along comes a lustful male of a different hue, and the next batch is a mixture of everything!

This raises one or two problems as you begin to realise that unless you do something to curb these undesirable matings the tank will soon be crowded with nondescript fish that bear no resemblance at all to your original handpicked pair. So what can be done? Obvious say some people, separate the sexes. This may be the answer in some cases, but two species immediately spring to mind where this solution could

be undesirable. With Guppies keeping numbers of males together, in my opinion, causes too much "showing off" and this leads to split fins; here I shall probably be told off by the Guppy fanciers as they probably use this ploy to make sure that their males *always* display, so that at Shows they will be seen at their best. The other situation in which, personally, I would not advocate keeping males together is with Swordtails. I have found that males are too "stroppy" when kept in numbers, so perhaps a better method would be to keep solitary males each with his own harem of handpicked ladies. Of course, the experienced breeders may have developed systems to overcome these problems with these two species, but I must confess that I am not a serious livebearer breeder, and prefer to think of any extra young I get as sheer profit!

It may be interesting at this stage to reconsider our views on what we think is meant by breeding; to a lot of aquarists, it means that their fish have produced young. This is strictly true, but more experienced aquarists would take the definition a bit further. A successful breeding to them is one where the young prove themselves to be fertile after being grown on (not much point in breeding sterile young anyway!). In addition, to the livebearer fancier, breeding means that the strain remains true, that is, the young are of similar coloration to the parents. The latter requirement and its achievement is the aim of every serious breeder and years of patient selecting, conditioning and ruthless culling are often necessary to produce the strain required. An example of this is the "race" to produce an all-black Guppy, and other achievements, not to everyone's liking, are all the permutations of hi-fin, lyre tail, and albino features.

The case for livebearers then: easily bred, hardy and colourful, a good beginner's fish to build up confidence in fishkeeping, but, because of its ease of breeding, very demanding in keeping the strain pure. An added attraction, with their help, an easy way to teach children some of the facts of life!

We come now to the alternative—the egglayers.

I suppose one advantage of these species is that due to their "Difficulties", they can be bred when the aquarist requires them to, and not when they decide to! This paradoxical statement may need explaining as, of course, the species will spawn whenever the urge takes them, but the eggs and fry will be eaten by the parents

or the other fish. When I said that they will breed when the aquarist requires them to, I was implying that the young will survive only when the aquarist provides the optimum conditions, e.g. spawning the adults in a tank of their own, and removing them if necessary after spawning, and it is in this way that the aquarist determines the timetable.

One thing with the egglayers, at least they breed true, and there are no "throw backs" to previous matings as with the livebearers. Hybridisation will occur, the Rosy Barb will spawn with the Nigger Barb, the Dwarf Gourami has been crossed with the Thick Lip Gourami, and one or two cichlids have been known to choose other than normal partners. Likewise, various forms of the same species will breed together, lace, veiltail varieties not differentiating between themselves and the "standard" form, but this is an exception that can be avoided by selection on the part of the aquarist.

Because of the fact that certain conditions have to be right for the egglayers to spawn, it follows that these conditions are the ideal ones for the particular species in question and success is usually assured; also under these conditions larger numbers of fry are not only produced, but stand a better chance of survival. There is a certain amount of parental care shown by some of the egglayers, particularly the cichlids and some labyrinths, and this helps the brood survive should the aquarist fail to keep an eye on things. With the larger species the eggs are quite visible and with those that need a long incubation period, the aquarist can watch every stage of the embryo's development.

There is a wide choice of egglayers to choose from, not only in the number of species but also in the manner of reproduction. The most basic method is the haphazard scattering of eggs into the water. Then there are the fish that lay their eggs in specially prepared sites; the gouramis build nests of bubbles at the water surface, and the Splashing Tetra goes one further, by laying its eggs out of water on an overhanging leaf, then has to keep them damp with well directed splashes of water! The dwarf cichlids prefer secluded sites such as flower pots, and their larger relations bulldoze a site to suit their requirements! This rough treatment of the tank decorations is made up for by the sight of a large cichlid going quite sappy over a bunch of wriggling fry, and the subsequent care of the fry. Mouthbreeders incubate their newly laid eggs in the mouth of one parent during which time no food is taken, and after birth the young seek refuge in the parent's mouth whenever danger threatens. Of these diverse methods, by far the most interesting is that of the cichlids with their pre-spawning activities and parental care of the fry.

We have discussed so far the two families in so far as events leading up to spawning, and the desirability of only permitting the right fishes to breed, in the live-

bearers, and, at the right time, with the egglayers. Does the post spawning period present any difficulties that could sway our judgment in favour of either party?

Livebearer fry are self supporting and capable to survive, barring predators, from the start, and very little preparation in the way of special first food is required. Some of the larger species may need more room to grow in, due to large numbers of youngsters, but this requirement is necessary for any large fish.

It is a common belief that the road to success in raising egglayer fry is paved with broken infusoria jars and the like! Nowadays, with modern foods, a culture of smelly jars is no longer necessary; whilst on the subject of original foods for egglayers, it is surprising what large sized foods can be taken. The tiniest food is only really needed for the fry of the smaller species, and of the gourami family, although the dwarf variety needs tiny food, the larger relations can take crumbled flake food from the start. Cichlids are ready for brine shrimp and dried foods immediately and the most common problem with egglayers is finding room for them all!

Again, due to progress made possible by research, modern techniques and downright perseverance by dedicated aquarists, the one time mysteries of breeding the egglayers are no longer barriers to the would be breeder. Perhaps they do need a bit more pampering to induce them to spawn, but even that is not difficult with all the aquatic aids on the market; and more with and more tank bred fish becoming available, problems are disappearing every second! The fish are obviously spawnable, this is apparent from reports of fry being found in outside filters, so, if they are spawning voluntarily under community conditions, think what they could be capable of under conditions especially set up for them!

That then, is the evidence for both parties, but before you, the jury, decide on your verdict, a brief summary:

The livebearers—

Easy to breed (perhaps too easy, for a pure line to be maintained), fry able to fend for themselves, practical knowledge of genetics useful in serious line breeding, generally prolific.

The egglayers—

Fairly easy to breed, once the optimum conditions for the species to be bred have been set up, fry delicate and protection for eggs and fry needed, breed true with only a few hybridisations, parental care exercised by some species, generally prolific, wide choice of species and several modes of reproduction.

Each of the two groups has its ardent followers, each has its challenges and attractions, and each has so much to offer to the hobby. The evidence is before you, the verdict and the choice is yours—which?

OUR EXPERTS' ANSWERS TO YOUR QUERIES

COLDWATER QUERIES

By A. Boarder



Please note: Tropical and coldwater queries will not be answered by our experts unless a stamped addressed envelope is enclosed with your letter.

I have a fish tank, 18 in. x 12 in. x 12 in., with four two-inch goldfish. It has been set up for three months during which time I have been troubled with various diseases among the fish. They rub themselves at times on the rocks and have had Fungus and White spot. Why is this?

You seem to have had more than your share of bother with the fish. It may be that you have introduced pests and diseases with plants, *Tubifex* or *Daphnia*. Goldfish in tanks should keep well unless something harmful is brought in from an outside infected source. The fish which rub themselves occasionally may not be attacked by flukes, many fish act in this way now and again. If flukes are present on the fish there will be other signs such as, lowered finnage, going off their food, showing blood streaks on the body and becoming emaciated. Affected fish will also mouth at the surface and attempt to eat food without success. You have quite enough fish in your tank and it is always more difficult to keep the maximum number than if there were a few less. Fungus disease usually only troubles fishes which are in bad condition. The spores are like those of the common cold in that they are present most of the time. The fish have a natural protective covering in the form of slime which prevents pests and diseases from getting a hold. Once a fish is out of condition it is prey to anything harmful in the water. The condition of the water is often the main cause why fish are diseased. In good healthy water the fish keep in a good condition as their protective covering is intact. I am certain that 90 per cent of the trouble aquarists get with their goldfish in tanks is caused by over-feeding and the best way to get the fish back into a healthy condition is to change the water and then give them no food whatever for at least a week. Water turns foul in a short space of time when any uneaten food remains in the tank. Once this happens the fish go off their food and so things go from bad to worse when more food is given.

Would a glass fibre pool, of 12-15 in. deep be all

right for a water lily and fancy goldfish kept in a sun patio?

The pool will be quite safe in the patio unless it is so exposed that severe frost can enter. The depth would be quite enough for a water-lily providing it was one of the miniature types, such as *Nymphaea pygmaea* varieties. The fancy goldfish should be safe as depth is unimportant, it is the surface area which governs the number and size of fishes which may be kept. Providing, of course, that the water does not freeze up almost solid. One still reads of an inch of fish to a gallon of water, but this is a very out-dated method of assessment. A tank 24 in. x 12 in. x 12 in. can hold 12 in. of fish, not including the tail. This tank holds about twelve gallons of water. This gives the old idea a proper reckoning, but if the same amount of water was contained in a tank, 48 in. long 12 in. wide but only 6 in. deep, it would hold 24 in. of fish. The safer ratio is an inch of fish, excluding the tail, to each 24 square inches of surface area.

Please can you supply me with any information on Trout breeding and rearing?

I have had two similar letters on this subject, one from France, and so I will deal with them both here. The method used by most trout breeders was to take a clean dry container. When the Trout are spawning, usually October or November, a few fish are caught and kept in a keep-net at the river side or they are taken to a fish establishment. The fish must be in spawning condition before they can be stripped. A female (hen) fish is taken in one hand and held uppermost. Pressure is then applied gently from the head end down to the vent when eggs will be expelled. No water is as yet in the container. A male (cock) fish is then treated in the same way to expel the milt over the eggs. Some fresh water is then added and this is swilled round with the tail of a fish. After a time water is emptied off and fresh water is added. This is done to wash away any unwanted male sperms, which would soon die and could pollute the water. The eggs are then kept under running fresh water until the fry hatch out. From then on they are fed on very small particles of food. A mashing machine used to be owned by most trout breeders, and the following kinds of food were mashed up for feeding:—meat, fish, curds, egg, fish meal, shrimpt paste, mussels, chopped

worms or insects. Some breeders would turn the fry out into well protected running waters which had screen to prevent the fry from escaping. With this method the fry were able to obtain natural live foods from the river. A very important point to watch in order to keep or breed trout is that plenty of fresh water must be available all the time and strong aeration is essential.

In my collection I have a shubunkin which appears to have a tumour. It is quite large spreading over the nostrils and down to the mouth and is black in colour. The fish does not appear to be suffering at all and still feeds. Shall I operate on it and remove it to another tank?

The tumour may have been caused by a knock and it is probable that this trouble is not catching and would not be likely to affect other fish in the tank. However if you are going to operate on it then it should certainly be kept by itself. If the tumour does not appear to be red and inflamed it may not get any

larger and could possibly break by itself. If any inflammation is apparent, you can try cutting it with a sharp knife or razor and pressing out any contents. The fish should then be kept in a salt solution for at least a week. The solution should be a tablespoon of sea salt to a gallon of water.

I have purchased a tank with some veiltail and fantail goldfish and would like to get some Shukin; demi ranchu; oranda shishigashira, but unfortunately I cannot find a dealer who can supply me. Can you help?

With the exception of the oranda, these names are used by the Japanese for various varieties of goldfish. When one breeds any of the double-tailed varieties there are always many varied shapes among the youngsters. English breeders discard these but it appears that the Japanese keep all these oddly shaped fish and invent special names for them. You should be able to get orandas from dealers who advertise in the "Aquarist."

TROPICAL QUERIES

By Jack Hems

I am bottom-heating a large breeding tank with the aid of oil lamps. The fish appear to be in the best of health but I cannot keep the surface of the water clear of a dirty white scum. Will this harm the fish?

Provided you remove the oily film periodically no harm will come to the fish. Years ago I heated my tanks by oil and bred various fishes such as rosy barbs, opalescent fish and several anabantides most successfully. But you can reduce oil fumes by burning only the best quality paraffin oil, keeping the burner and top of the oil-container scrupulously clean, and seeing that the room in which the tanks are accommodated is properly ventilated.

Is a cover glass necessary on all tropical tanks?

A cover glass is not an essential piece of aquarium furniture, but it does lessen evaporation and loss of heat, prevents active and scary fishes from leaping to their doom, and guards against excessive dust settling on the water. Another thing, a cover glass lessens the risk of tobacco smoke and coal-gas, sometimes present in some homes, poisoning the water.

I am quite new to this fascinating hobby of fishkeeping, and when I bought some vallisneria plants the other day I noticed what looked like elongated blobs of amberish-tinted gelatine adhering to the leaves. I dare not introduce these plants into my aquarium until I hear from

you, for my wife is of the opinion that they are the eggs or dormant form of some water pest.

The jelly-like blobs on your plants are the egg-capsules of water snails. Remove the capsules from the plants with a blunt knife or your finger nail. Snails in a tank soon become a nuisance, though they will not harm your fish.

Kindly give me some information on the care, disposition, and maximum size of *Datnioides quadrfasciatus*.

Fishes of the genus *Datnioides* (Tiger Fish) flourish best in soft water giving a neutral to acid reaction. A temperature in the neighbourhood of 75° F (24°C) is called for. They are essentially carnivorous fishes and need live food and suitable dead-flesh substitutes. They have large mouths and do not think twice about gulping down swallowable companions. Yet they are not quarrelsome and are quite suited to sharing a tank with other fishes of about their own size. *D. quadrfasciatus* is said to exceed 12 in. in the natural state, but it is unlikely that it will grow to much over half this length in the ordinary home aquarium.

Can you tell me anything about a fish called *Rooseveltiella nattereri*?

This is the well-known red-breasted or Natterer's (*Serrasalmus* or *Serrasalmo*) piranha under a new generic name. Whether this change in nomenclature will be accepted by all zoologists remains to be seen.

I have been told by an aquarist who claims he is an expert that underground filtration is not the best form of filtration there is and that an ordinary outside filter is as good as any for keeping a fish tank in perfect condition. Is this true?

Perhaps a combination of both types of filtration, that is undergravel (not underground) and external, is the most satisfactory arrangement, but let me say at once that it is possible to maintain a freshwater aquarium, stocked with the right sort of fishes and planted well, in perfect condition for years on end without a complete change of water. But to return to the question of the best type of filter. There is no such thing on the market at the time of writing. The undergravel filter performs a service that the external filter cannot do. In brief, it sucks decaying wastes under the sand and converts them, by bacterial activity, into harmless silt. On the other hand, the outside filter traps and confines particles of waste matter floating free in the water and keeps the aquarium crystal clear. The larger and more powerful the pump used to circulate the water (as in a turbo filter) the greater the efficiency of the filter.

I made a screen of small meshed chicken wire to separate some quarrelsome cichlids in my tank. But the fish have been dying off with no signs of disease unless one could call a diminution of colours a sign of disease. Do you think the introduction of the wire screen is in any way connected with their deaths?

Time and time again we have warned readers about the danger of introducing metal (except stainless steel and minute quantities of lead) into their fish tanks. Your fishes have died of metal poisoning. You will have to empty all the water away and start all over again. It is not unlikely that some of the fish left alive in your tank will die within a matter of a few weeks, even after removal to fresh water.

Are albino fish diseased? My local pet shop owner says they are. Please let me have your views about this.

Albino fish are not diseased in the sense that aquarists interpret the word, but genetically speaking albinism is a sign of disease: it denotes the absence of melanin, the pigment that gives dark shades of colour to humans or animals. True albinos (those with red-currant eyes) seldom, if ever, make such hardy creatures as those displaying some dark colours. In the animal world the albino forms are usually more gentle in disposition than the ordinary type. The white paradise fish, for instance, is less aggressive than the common paradise fish; the albino swordtail less cocksure than the green or red swordtail.

I would like to keep a school of black widow fish in my community tank, but have read some-

where that the black widow is a fin-ripper. What would you advise?

Young (small) black widows are rarely a problem in a well-planted tank. It is the big ones that sometimes, but not always, turn into compulsive fin-rippers. All the same, they usually do little or no damage at all in a tank housing sleek and small-finned species such as hypheosobrycons or nannostomus. It is fish like angels, voluminous-finned guppies, and the like, that attract a black widow's attention. And another thing, several black widows introduced into a tank are less likely to interest themselves in other fishes than, say, a single specimen or a trio.

Could I keep a couple of axolotls in my tropical fish tank?

I do not doubt that a couple of axolotls would settle down nicely in a spacious tank maintained at a temperature in the upper sixties to lower seventies (°F), but what you must bear in mind is that a hungry axolotl looks upon anything that moves in the water as prey, and small fish swimming close would vanish down an axolotl's throat as rapidly as minnows into the maw of a pike.

Axolotls



What is the secret of growing lasting bushes of cabomba?

Frankly, I do not believe there is a secret about growing cabomba large and well. It is a matter of giving the plant the sort of conditions that suit it and starting off, of course, with firm stemmed rooted, or unrooted, plants or cuttings. Cabomba requires a bright but not glaring top light, a non-calcareous compost, and water that is soft and almost if not quite lime-free. Frequent pinching back encourages the development of large whorls of leaves on sturdy branches.

I have been given a small plant of *Echinodorus martii*. I should very much appreciate some information on the care and propagation of this plant.

E. martii flourishes best in soft water, that is neither pronouncedly acid nor alkaline. It needs the sort of light that suits the stand-by plants such as *Sagittaria* spp. or *Vallisneria spiralis*, and sufficient water over its crown to enable it to raise its ruffled foliage some 12 in. from the bottom.



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 5th of the month preceding the month of publication.

THE competitive season at **Haling and District A.S.** ended with the Club's second Closed Show on the 25th January. This event gives everyone a final chance to win a Card, and often tempts the usually shy members to put their fish on the bench.

The Best Fish in Show award went to a Junior member, J. Ankin, and a feature was the inclusion of a special class for Aquascapes (inspired by the similar class seen at last year's R.A.F.). The winner, who also took second place, was J. Batts who had obviously remembered all he had seen at Manchester!

The last Club meeting of the year will consist traditionally of a general discussion evening.

Closed Show Results (F.B.A.S. recommended schedule classes): Ad: 1, L. Sandfield; 2, R. Barrett; 3, J. Healey; 2 and 3, C. Ankin; 4, R. Savage; C: 1, J. Ankin; 2 and 3, J. Irvine; 4, R. Sears; D: 1 and 2, J. Healey; 3, T. Cruickshank; 4, C. Rainbow; Db: 1, T. Cruickshank; 2, R. Sellers; 3 and 4, A. Ankin; E: 1 and 2, J. Healey; 3, J. Batts; 4, C. Rainbow; F: 1, R. Sellers; 2, P. Heal; 3, Mrs. D. Cruickshank; 4, J. Healey; G: 1, T. Tapp; 2, J. Batts; 3 and 4, R. Barrett; H: 1, T. Cruickshank; 2 and 3, Mrs. D. Cruickshank; J: 1, Mrs. D. Cruickshank; 2 and 3, P. Huse; 4, R. Sellers; K: 1, J. Healey; 2, R. Barrett; L: 1, J. Healey; 2 and 4, D. Church; 3, T. Cruickshank; M: 1, R. Sellers; 2, J. Healey; 3, Mrs. D. Cruickshank; 4, R. Savage; N: 1, G. Ennever; 2, Mrs. W. Church; 3, T. Cruickshank; 4, R. Mills; O: 1, J. Healey; 2, P. Heal; 3, C. Rainbow; P: 1, C. Ankin; R: 1, Miss Y. Savage; R: 1, J. Healey; 2, J. Irvine; 3 and 4, J. Ankin; S: 1, R. Barrett; T: 1, Mrs. D. Cruickshank; Na: 1, J. Healey; Nb: 1 and 2, R. Barrett; Z: 1 and 2, P. Heal; 3 and 4, R. Mills; Special Class: 1 and 2, J. Batts; 3, C. Ankin; 4, R. Barrett.

THE **Hacknall and Bulwell A.S.** has now established a junior section and membership is free. Meetings are held with the Adult section and further details of all society events can be obtained from M. T. Harrington, 5 Greenwood Vale, Hacknall, Nottingham.

The Slide Tape show made of last year's home tank competition has been on hire to several clubs and is available for hire for £1 plus return postage. The reaction of the clubs has been good and some have shown the slides twice in one evening. Other events to take place during the year are the annual coaching this year to London and a large public exhibition by the members of furnished tanks is also to take place on Bank Holiday Monday at the Local Carnival.

AT the annual general meeting of the **West London Section** of the P.G.A., the following members were elected to the committee for the year 1970-1971: Chairman: J. Thorne; Assistant Chairman: J. Rodio; Treasurer: Mrs. J. Thorne; Show Secretary: G. Greenhalf; Assistant Show Secretary: Mrs. R. Greenhalf; Secretary: R. Elmes; 24 Sunview Avenue, Peasebarn, Surrey; P.R.O.: Mrs. B. Elmes; Show Stewards: Messrs. M. Levi, J. Bradford.

Following the election, Neil Fisher from America gave an interesting talk on fish and genetics. The speaker has worked on genetics for many years and has produced the rare and complete all-black guppy. Anybody interested in joining the society can be sure of a warm

welcome. The association meet at the Community Centre, Clifton Road, Halesworth, on the third Sunday in each month at 3 p.m.

AT a previous meeting of the **Hemel Hempstead A.S.**, the results for the Livebearer class were: 1, L. Bamfield; 2, T. Gray; 3, T. Craddock. The results of the Killifish class were: 1 and 2, A. Dibbey; 3, Master C. Gray.

Despite a severe blizzard there was a good turnout for a meeting in which Roy Skipper talked on the keeping and breeding of Discus fish. Mr. Moody, of the Amersham A.S., gave a talk upon ponds and coldwater fish at short notice at the second January meeting. The results of the Danio, Rasbora and Minnow class were: 1, Master D. Whitbey; 2, A. Dibbey; 3, T. Craddock. After much discussion between the judges the results of the Breeders Groups were announced as equal first for Master D. Whitbey and P. Tucker. Third place went to Master C. Gray.

THE commencement of the **Reigate and Redhill A.S.** activities this year was an Auction Meeting which was attended by over forty members.

The 1970 Committee, under the chairmanship of A. Young is keen to maintain the growth of the Society and to provide a wider field of interest to attract new membership. With this in mind, the programme for the first half of this year has been arranged to include talks and slide shows on subjects ranging from Marine Aquaria to Fish Farming, and from Furnished Aquaria to Trade importing. Table Shows are held at each meeting.

The new officers and committee for 1970 are: President, Ken Pawcett; Chairman, F. R. Young; Vice-Chairman, E. Canacott; Committee, Messrs. I. Stemp, S. Perham, G. Collins, Q. Taylor. The new Honorary Secretary is Mrs. B. Humphreys, 10 Chelberton Drive, Merstham, Surrey; Show Secretary, John Wood, 22 Rickman Hill, Coulsdon, Surrey.

The Society meets at Somers Hall, Slipshoe Street, Reigate on every other Monday evening (except Bank Holidays); meetings are on the 16th and 31st March, 13th and 27th April and so on fortnightly. All are welcome to come along.

THE **Bristol Tropical Fish Club** members had their interest well roused by a fine talk on keeping Tropical Marines presented by J. Wheeler at the January meeting. His own recent experiences certainly dispensed some of the doubts surrounding this branch of fish-keeping. The specimens brought along for the evening in normal show jars were further evidence of the speaker's confidence in handling these fish. Local clubs would be well rewarded in persuading the speaker to present this talk at the monthly meeting.

THE New Year programme of the **Bethnal Green A.S.** was off to a fine start this month with two Table Shows, lecture and an evening of slides and film taken by members.

The Points Competition Table Show was for Female Mollies, Platies and Guppies, the winning members being: Guppies: 1 and 2, Mr. Gower; Platies: 1, Mr. Gower; 2, Mr.

Bridgeman; Mollies: 1, 2, 3 and 4, Mr. Davis. The "Fish of the Month" Table Show brought forth some really first class exhibits, duly praised by Mr. Tomkin, who judged them. The winning members of this show were as follows: 1, Mr. Arnold; 2, Mr. Bundy; 3, Mr. Gower; 4, Mr. Brindley.

The meeting for the showing of members' films and slides proved to be a very entertaining evening, with slides of Marine and Coral fishes, Tropical and Coldwater fish. All the slides were taken by members who were at the moment just "dabbling" in photography, but judging by the results were fast learners, for there were some beautiful slides. The lecture given by Mr. Tomkin on Show Standards was a guide to new members for their future showing of fish and proved most enlightening. The Society looks forward to another interesting month and welcomes any new faces who wish to come along. Meetings are held every Tuesday evening from 7.30 p.m.—10 p.m. at the Bethnal Green Institute, 229 Bethnal Green Road, E.2. Any further information may be obtained from the Secretary, P. Arnold, 128 Amhurst Road, Hackney, E.8. Tel. 254 5737.

ABOUT sixty members and friends were present at a social evening of the **Warrington A.S.**, which was organised and run by K. Tench. The chairman was L. Crawford. A Gourami drive with good prizes was the first event, this being followed by a free raffle. R. Tench next conducted fish bingo, which was enjoyed by all members. Fish of the Month results were: A.O.V. Livebearer: 1, A. Addison; Platies: 1 and trophy, L. Crawford; 2, M. Baker and runner-up trophy; 3, A. Addison; Platies: 1 and trophy, L. Crawford; 2, J. Higham; 3, M. Baker. The Midlands Hotel is the H.Q. of the club and interested persons should write to the Secretary, A. Addison, 5 Hewitt Street, Lanchford, Warrington, Lancs., for details.

THE highlight of the January evening meeting of the **Plymouth A.S.** was a long and interesting talk by founder member Ken Henderson on the presentation of backgrounds for home aquaria. With the aid of coloured glass, rockwork, artificial plants and painted backgrounds, the speaker illustrated his talk profusely and showed how he considered different aquaria might be arranged to please both young children and experienced fish-keepers alike. Heaters, thermostats and wiring were all cleverly hidden so as not to detract from the artistic arrangements. Show Secretary, Mr. Ray Garteil, explained to members how fish were being selected to represent the Plymouth club at inter-club shows.

The month's Table Show was for A.V. Guppy. Prize cards were awarded to: Novice Section: 1 and 3, R. Lucas; 2, R. Bull. Advanced Section: 1, W. Horswell; 2, W. Horswell; 3, W. Reid. There were insufficient entries for prize cards to be awarded in the Premier Section but D. Budd received a Highly Commended award for a large female Guppy. Best fish in the show was W. Horswell's entry.

IN January the **Derby Regent A.S.** held their Annual General Meeting and once again are pleased to have A. Deakin as the President for the forthcoming year. Other officers are as follows: Chairman, W. Thompson; Vice-Chairman, R. Ellis; Treasurer, T. Gerrard; Asst. Secretary, R. T. Bull; Show Secretary, E. Hazeldine; Asst. Show Secretary, Mr. Cunningham; Librarian, H. Witney; Committee Member, Mr. Bland; Magazine Editor, P. Wilby; Secretary, P. Kendrick, 10, Camberhills Road, Duffield, Derby. The Society Magazine is growing in popularity and editions are increasing in size monthly.

THE Annual General Meeting of the **North Kent A.S.** was held recently and the new Committee is as follows: Chairman, T. Flint; Secretary, J. Stephens; Show Secretary, J. Parker; Social Secretary, P. Willis; Asst. Secretary, C. Wood; Asst. Show Secretary, R. Birch; Treasurer, C. Hunter. For a copy of the year's programme or any more information please contact J. Stephens, 2 The Thrift, Ashwood Park, Beas, Dartford, Kent.

THE new Committee formed at the Annual General Meeting of the **Clapham A.S.** is as follows: Chairman, P. G. Glynn; Secretary, Mrs. E. Trim; Treasurer, J. Mills; Show Secretary, A. Hart; Mr. and Mrs. R. Rowe and J. Trim. Table Shows and Lectures are arranged at each meeting and all fish hobbyists are welcome. Inquiries to Mrs. E. Trim, Hon. Secretary, 87 Charlmont Road, Tooting, S.W.17.

AT the third Annual General Meeting of the **Association of Manchester and District Societies**, the following changes of officers were made: Chairman, P. Mulla; Vice-Chairman, C. Walker; Secretary, A. Newall, 157, Fog Lane, Didsbury, Manchester 20 (Tel. 061-445 1655).

THE officers and committee of the **Nuneaton A.S.** are now as follows: President, G. Haines; Chairman, D. Rice; Vice-Chairman, P. Bosley; Secretary, G. Cox, 36, Manor Court Road (Tel.: NUN 66277); Treasurer, Mrs. I. Cox; Show Secretary, S. Blodham; Committee, Messrs. D. Tunnicliffe, J. Ancoot, J. Wincock, C. Hall, Mrs. V. Haines. It was agreed at this meeting that a register be kept of any fish bred by members who wish to show in any breeder's classes. These fish are to be registered within one month of birth. The meeting place is now the Cherry Tree, Stockingford, Nuneaton.

AT the Annual General Meeting of the **Streetsford and District A.S.**, the following officers were elected: Chairman, R. Wilde; Vice-Chairman, I. Whitaker; Secretary, R. D. Hunt; Treasurer, A. Bebbington; Asst. Secretary, S. Hunt; Show Secretary, A. Stear; Asst. Show Secretary, A. Gleave; Show Committee Members, T. Hunt, M. Paeker, C. Stear; Committee Members, D. Greenland, J. Jackson.

The society's programme, for the first half of the year, has been planned to encourage the newcomer to the hobby. At every fortnightly meeting there is talk or lecture on some aspect of general fishkeeping interest, plus the usual table show every six weeks; sections, rallies, etc. Film shows and slide-tape lectures are included for the experienced and non-experienced alike. Meetings are held on every other Thursday at 8.30 p.m., at the A.E.L. Social Club, Moss Road, Streetsford. The next meeting will be on March 5th when there will be a talk, given by the Chairman on "Breeding the biglayers". Visitors and new members very welcome.

RESULTS of the Annual General Meeting of the **Harwich & District A.S.** at the beginning of January were: Chairman, R. Cann; Secretary, P. D. Baker, 1, Maria Street, Harwich, Essex; Treasurer, Mrs. Diaper. The meeting place is at the Alma Inn, Kings Head Street, Harwich.

THE formation of the **Gainsborough A.S.** was decided at the 30th October meeting. The meeting was attended by thirteen people and a committee of seven was elected. The Chairman is A. Thorpe and the Secretary A. Chapman, 26 Arkwright Street, Gainsborough. The date was set for a committee meeting and at the next general meeting, twenty-seven people attended, indicating a good future for the Society. It would be appreciated if anyone willing to give lectures or talks would contact the Secretary.

AT the **Longbridge and District A.S.** annual general meeting the following members elected to serve: Chairman, G. Shipman; Secretary, L. Astill, 23 School Road, Rubery, Birmingham; Treasurer, D. Hedges; Show Secretary, K. Atwood; Committee: G. Furness, J. Fellows, J. Kinberlin, I. Jones, Mr. Wilkes. The beginning of the third year shows an increased membership, but new members are invited especially beginners. The table shows last year was a great success and well attended.

THE main event at the last meeting of the **Thurrock A.S.** was the presentation of the 1969 awards by the Chairman, M. Martin. Winners of the awards were as follows: Swanbury Shield: 1, F. Harkins; 2, Mrs. E. Nicol and G. Eaton. Truby Trophy: 1, F. Harkins; 2, P. Hinkley; 3, H. Juson; 4, R. Alborough.

Holland Trophy: 1, D. Durrant; 2, P. O'Bryan; 3, E. Nicol. Table Show Medallion: 1, F. Harkins; Fry Rearing: F. Harkins; Home Aquaria: L. Bashford. Member of the Year Shield: R. Nicholls.

The evening continued with a Brains Trust formed by members of the club, who to the best of their ability, answered questions posed by other members. Table show was for A. V. award winners and the results were: 1, D. Durrant; 2, R. Alborough; 3, J. Hatton.

THE **Edmonton Section of F.G.A.**, which covers the North Eastern portion of The Greater London Area, together with parts of Hertfordshire, Middlesex, and Essex, recently held their Annual General Meeting and the following officers were elected for 1970: Chairman, D. Curry; Secretary, D. Phillimore; Treasurer, W. Holmes; Show Secretary, H. Rhind; Public Relations Officer, E. R. Manning. Further details can be had from D. Phillimore, 103 Wilbury Way, Edmonton, London, N.18. Tel: 01-803 3032.

A VERY interesting talk was given by Bernard Ketton to the **Horsforth A.S.** on the diseases of fish. The usual table show was held with the following results: A.O.V.: 1, J. Gudham; 2, S. Greaves; 3, G. Corns; Junior A.O.V.: 1 and 2, Master J. Douglas; Specified A.O.V.: 1, M. Barker; 2, S. Greaves; 3, J. Gudham. Best fish in Show, Trophy to be held for a month, went to J. Gudham, with an *Apistogramma surcraigi*. Before the meeting ended, questions were asked, and Mr. Ketton supplied the answers.

OFFICERS elected at the **Thorne A.S.** Annual General Meeting were: Chairman, T. Dickens; Treasurer, R. Shipley; Committee, T. West, P. Nibbs, B. Moore. Secretary, R. Snowden, 33 Alexandra Road, Moorlands, Nr. Doncaster, Yorkshire.

TWO meetings have been held by **Tonbridge and D.A.S.** recently. The first was an informal teach-in run by the Committee at which members were able to prepare and view microscope slides of live foods, plant sections and fish diseases. A few fish were dissected to demonstrate techniques.

At the regular monthly meeting P. Burgess of Tonbridge Wells showed some cine films including some of his own photography of aquarium fish which had a particularly interesting sequence showing Siamese Fighters nest building.

Table Shows for the month were as follows: Non-breeders only—A.S. Tiggler: 1 and 2, T. Hives; 3, R. Baker, A.V. Danio: 1, R. Taylor; 2, J. Bellingham; 3, R. Baker. A.O.S. Catfish: 1 and 3, R. Baker; 2, J. Bellingham. A.V. Swordtail: 1, J. Matheson; 2, D. Allen; 3, R. Baker.

THE **Marseyside A.S.** enjoyed a very successful year in 1969 and steadily recruited new members to its ranks. At the Annual General Meeting held in January, the Chairman, Mr. Mulla thanked the retiring Committee warmly for their loyalty and hard work throughout 1969—he felt that this was a major factor in the growth of the Society. That members agreed with him was substantiated by their election of Officers for 1970.

The Society meets alternate Mondays at The Montrose Athletic & Social Club, 5 Richmond Terrace, Liverpool 6 (Bank Holidays excepted) and new members can be assured of a warm welcome. The Secretary is R. B. Moscroft, 24 Frankby Road, Liverpool L4 7HX. W. Smith, 1 Sunningdale Road, Liverpool L15 4HJ, has been re-elected Show Secretary for 1970.

THE main item on the agenda at the January meeting of the **New Forest A.S.** was a colour slide lecture on Brine Shrimp. Although the lecture had been shown several years ago, it was much appreciated by the many new members and also by the older members. The results of the Table Show were as follows:—A. V. Danio: 1 and 2, C. Knapp; 3, R. Travers. Special: A. Williamson. Labyrinth: Special: A. Williamson; 1 and 2, R. Moseley; 3, R. Travers; 4, D. Harding.

For details of membership please contact R. Travers, 6 Auckland Avenue, Brockenhurst, SO4 7RS.

AN emergency programme was planned at the monthly meeting of the **Bristol A.S.** at a very late stage to cater for Neil Teitler of New York, U.S.A. who, while on a visit to England, called on the Society to give a slide show and commentary of unequalled excellence to the attending members. Mr. Teitler is the secretary of the Goldfish Society of America and although he is an expert on goldfish history and genetics, backed by the practical experience of working in a laboratory catering for eight hundred tanks of various sizes to study live-bearing freshwater tropical fish, he felt that his short stay in Bristol would be of immense value to discover the views held in the West Country.

A brief preview of some of the slides taken by members at the recent B.A.F. at Manchester, were shown and these were followed by Mr. Teitler's programme of slides, which showed many varieties of fish, both tropical freshwater and marine.

THE Annual General Meeting of the **Coventry Pool and A.S.** was held in January and the following officers were elected: President, P. O. Smith; Vice-President, J. H. Stanton; Secretary, J. Grant; Chairman, E. J. Sheehy; Treasurer, F. Shipston. During the last season the Society has been well entertained by some extremely capable speakers who very kindly visited the club, bringing with them a varied selection of good films and slides.

An invitation is extended to visitors and prospective members who are always made welcome. The club meetings are held every month on the second Tuesday, the venue being the Foleshill Community Centre at 7.30 p.m.

AT the Annual General Meeting of the **Hampstead and District A.S.** the following officers were elected: Chairman, K. J. A. Pyle; Deputy-Chairman, H. Harvey; Secretary, J. Hiscoke, 5 Maunton, Agar Grove, London, N.W.1; Treasurer, Mrs. V. Reich; Show Secretary, T. Casack; Assistant Show Secretary, R. Ward; P.R.O., L. Smith; F.R.A.S. Delegate, E. Harvey.

Trophies were awarded to the following members: Mrs. V. Reich, Tropical Points Cup, Cichlid Cup, Labyrinth Cup, Catfish Trophy. Mr. and Mrs. Luff, Coldwater Points Cup, London Booseth, Gamden, Livebearers Cup, Breeders Cup, Fighters Trophy, J. Hiscoke, Characin Cup, Carp and Minnow Cup, T. Casack, Angel Trophy. The Society wishes to thank all who have subscribed to making the previous year a successful one.

IN January the **Kingston and District A.S.** held their Annual General Meeting, when the following Officers took office: Chairman, B. Pawley; Secretary, Mrs. H. Falhurst, 37 Woodstock Avenue, Sutton, Surrey. Tel. No. 01-644 8063; Show Secretary, G. Greenhalf, 39 Garth Close, Meaden, Surrey. Tel. No. 01-337 4042; Treasurer, Mrs. R. Greenhalf; Committee, J. Pollard and P. Huffman.

Meetings are held every first and third Thursday of each calendar month at Elm Road School, Elm Road, Kingston-upon-Thames, Surrey, at 8 p.m.

A VERY successful year was reported at the Annual General Meeting of the **Hull A.S.** Ron Bulsh, a very hard-working Secretary, was re-elected. The Committee is as follows: President, F. Chapman (re-elected); Chairman, A. Douglas (re-elected); Secretary, R. Bulsh (re-elected); Treasurer, E. Storry (re-elected); Show Secretary, R. Holt; Assistant Show

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Secretary, R. Thackray; Assistant Secretary, G. Bach (re-elected); Vice-Chairman, T. Douglas (re-elected); Librarian, P. Burrows (re-elected).

Correspondence regarding all club activities should be sent to R. Bach, 102 Westcott Street, Holderness Road, Hull, East Yorks., or G. Bach, 32 Hazelbarrow Drive, Wolferton Road, Anlaby, East Yorks.

THE Farnborough and District A.S. scored their first success of 1970 when, at their new club venue, the White Hart, Frimley, they defeated Didcot and District A.S. by 157-143 points in a "Best of 12" competition. First place was taken by R. Wynd with a fine Half-banded Barb for Farnborough, followed closely by a handsome Chequer Barb from Didcot and District A.S., who also collected third place with a beautiful Sword-tail Guppy. Fourth place was taken again by R. Wynd with a Red-tailed Shark. The judging was by Richard Armstrong, F.B.A.S., who followed up his quick but accurate assessment of the fish on show as to the various reasons for down-pointing. The judging was followed by a general discussion and Social Evening and was extremely entertaining especially when the judge won first prize in the raffia.

The following officials were elected at the **Dewsbury and District A.S.** Annual General Meeting: President, S. Brown; Vice-President, C. Timewell; Hon. Secretary, E. Hemmingsway, Wilson House, Rutland Road, Hatley, Yorks.; Treasurer, M. Pugh; Show Secretary, D. Dunford; Social Secretary, R. Ellis; Librarian, G. Woodhouse; Auditors, D. M. Crowther and A. Bradley; Liaison Office, M. Pugh; A.Y.A.S. Delegates, H. Hall and B. Green; F.N.A.S. Delegates, G. W. Cooke and A. Bradley.

THERE was a good attendance of members at the Annual General Meeting of **Hyde A.S.**, despite the cold weather. The meeting heard the Chairman, D. R. Chambers, give a favourable review of the previous year, saying that although the club was a new one, the main objective, to attract members, had been achieved, the membership standing at over fifty. The Secretary, B. Riley, gave his report. He endorsed the Chairman's remark that membership was on the increase and any outstanding applications would be dealt with as soon as possible. The Treasurer's report showed a profit after the first year.

The Chairman said of the future that the Club would continue to give its members "Value for money" as the programme for the whole of 1970 proved. Visits have been arranged to several Zoos, including MarineLand, Morecambe and London Zoo, as well as normal Club meetings, etc. All of last year's officials were unanimously re-elected. Chairman, D. Chambers; Secretary, B. Riley, 133 Manor Park Road, Glossop, Derbyshire; Treasurer, J. Dewstnap. Any prospective members are asked to contact the Secretary, B. Riley, at the above address, or at the Clubroom every alternate Wednesday at the White Hart Hotel, Flowerly Field, Hyde.

AT the annual general meeting of the **Riverside A.S.** held in January, the following officers were elected: Chairman, T. Sears; Secretary, A. Wood, 3 Farman Grove, Northolt, Middx.; Treasurer, G. Pocock; Show Secretary, M. Goss; Public Relations, C. F. Buckland. All meetings are held at Blythe Hall on alternate Mondays at 8 p.m. New members welcome. Please contact C. F. Buck, phone: 748 9380.

THE Dukeries A.S. held its annual general meeting in January and the officials appointed

for the year were as follows: President, J. Hutchinson; Chairman, D. Jackson; Secretary, B. Prost, 102 Aunin Avenue, Worksop, phone: 3956; Treasurer, J. Devnie; Show Secretary, M. Woodley, 56 Silverdale, Dinnington, Sheffield; P.R.O., Miss L. Towell and D. Jackson.

This completes a first year of remarkable progress. After being in existence for only four months the first Open Show was staged, held in ideal surroundings with excellent facilities at the Winifred-Portland Technical Grammar School, Sparken Hill, Worksop. This proved a great success, a success which it is hoped will be repeated on the 3rd May, when the Second Open Show is held at the same venue.

In October the Society put on a stand at the B.A.F., and although this did not feature in the results, members gained several awards with fish and plants. During the rest of the year members have been making their presence felt at most open shows with a total membership (restricted) of only twelve.

PORTY-ONE members attended the second meeting of the newly-formed **Harrogate A.D.A.S.** in January to see a taped slide show entitled "Designing the Home Aquarium." Meetings will be held on the second Tuesday in every month at the Conservative Rooms, 15 Park View, Harrogate, commencing at 7.30 p.m.

At the March meeting three members will be giving short talks on "Glazing a Tank," "Electricity and Water," and "Breeding Livebearers."

New members will be made very welcome.

OFFICERS elected at the annual general meeting of the **Harlech A.S.**, held in January, were as follows: Chairman, S. Nelson; Secretary, M. Parry, 37 Casera Court Road, Ely, Cardiff; Treasurer, Mrs. Marilyn Brown; Show Secretary, A. Payne, 56 St. Pagan's Rise, Fairwater, Cardiff; Librarian, Mrs. Beverley Parry; Committee Members, Messrs. A. Francombe and A. Ward.

The society's programme of meetings for 1970 has already been arranged; details of the speakers being as follows: 17th March, G. F. Cox, Proprietor, SeaAquariums Ltd., Croydon; 21st April, J. V. Morrize, Hendon and District A.S.; 19th May, G. E. Williams, Deputy Curator and Zoologist, Horniman Museum, London; 16th June, Roy Skipper, Proprietor, House of Fishes, Hemel Hempstead; 21st July, Knockout Competition; 18th August, A. G. Jessopp, Chairman, Federation of British Aquatic Societies; 15th September, S. P. Dance, Assistant Keeper of Zoology, National Museum of Wales; 20th October, Dr. Neville Carrington, Managing Director, Inter-Pet, Dorking; 17th November, G. H. Jennings, Kraken Products, London (provisional only); 15th December, Knockout Competition.

The society meets on the third Tuesday of each month at the Gabalfa Junior School, Colwill Road, Cardiff. New members are welcome.

THE Fancy Guppy Association. The officers for this year of the Radlett Section are as follows: Chairman, H. Garmell; Vice-Chairman, Len Smith; Hon. Secretary, G. A. Goodhall; Hon. Treasurer, Ruby Harris; Show Secretary, H. Harris; Asst. Show Secretary, B. Rummy; Show Stewards, Messrs. T. Moriarty, P. Abbot, L. Weller, R. Harper. The Show Committee for Exhibitions: Chairman, G. A. Goodhall; Secretary, D. Phillimore; Messrs. L. Smith, B. Rummy, T. Manning. New members are welcome and the meeting place is the second Sunday in the month at the Guides Hut, Watling Street, Radlett, Herts.

AT the first annual meeting of the **Borehamwood and District A.S.**, the following Committee was duly elected: Chairman, R. Rummy; Vice-Chairman, G. Cherry; Secretary, P. G. Abbott, 206 Tempford Avenue, Borehamwood, Herts; Treasurer, R. Woolveridge; Show Secretary, J. Burrows. The following ex officio were also elected: Assistant

Show Secretary, Master D. Housnell; P.R.O., P. Abbott; Auditor, P. Tanna. Trophies for the last six monthly Points League were presented to the following winners: Senior, R. Woolveridge, 60 points; Junior, D. Housnell, 30 points. The last meeting of 1969 was Table Show for A.O.V. Cats, Corydoras and Planes, Juniors. This was won by D. Housnell with Corydoras Aeneus. The class for adults was for A.O.V. Livebearers, which was won by E. Moriarty. The classes were judged by G. Greenough who also gave a talk on Preparation of Fish for Show.

The society meets on the second and fourth Mondays of each month at Allum Lane Community Centre, Borehamwood at 8 p.m., and a warm welcome is extended to all aquarists or intending aquarists at these meetings.

IN January the Goldfish Society of Great Britain held their quarterly meeting when the discussions on the standards for goldfish varieties, were continued. This was followed by a slide show and talk, given by D. Smalley, who is a member of the Society.

A special meeting was held at Caxton Hall, Westminster, W.C.1, on 17th January, when a film show was presented by Neil Teitler of the U.S.A., who is also a member of the Society. He gave a commentary on the film and answered questions afterwards. The next quarterly meeting of the G.S.G.B. at Caxton Hall, will be held on 18th April at 2.30 p.m.

The following officers were elected at the Annual General Meeting of the **High Wycombe A.S.**: Chairman, C. Cleave; Vice-Chairman, R. Thomas; Treasurer, A. Wilkinson; Secretary, B. Cooke, 28a Oak Tree Road, Marlow, Bucks.; Show Manager, C. Pike; P.R.O., K. Mortimer; Equipment Officer, R. Cox; Librarian, D. Schramm; Catering Officer, Mrs. O. Wilkinson; F.B.A.S. Delegate, C. Pike; Committee, Mrs. Cleave, R. Hicks, B. Kemp; Show Secretary, Mrs. S. Thomas.

The first open show, independent of Wycombe Show, was a great success despite the only wet day for weeks, and cramped conditions. In the coming year the Society has a varied programme which should prove interesting to all. Planning for the show which is on 5th July at West Wycombe Hall, West Wycombe, Bucks., is well advanced, and all members are keenly anticipating the coming season's battles at the shows.

The members of the **Bishops Cleeve A.S.** had a very excellent quiz slide show for the January meeting and this was greatly enjoyed by everybody. The quiz was won by K. R. Boston.

The members are very proud of the fact that the Society is now one year old and hope it will be extremely successful for years to come in view of this ever-increasing popularity of the hobby. The Table Show was for breeders teams (egglayers or livebearers): 1, N. Dooley (Egglayers); 2, I. Scriven (Livebearers); 3, N. Dooley (Livebearers).

THE Aireborough and District A.S. held their annual dinner recently and over fifty members were present. Part of the evening was taken up with the annual prize giving and E. Robinson (President) made the presentation to the following winners: Junior Table Show: 1, Master A. Fleisher; 2, Master A. Stretton; 3, Master K. Mothersdale, Novice: 1, B. Tate; 2, E. Hunt; 3, K. Mothersdale. Advanced: 1, Mr. and Mrs. J. Whitley; 2, J. Robinson; 3, J. Kay. Furnished Aquaria: 1, D. Robinson; 2, R. Johnson; 3, J. Whitley.

Most points in Open Shows (A. and P. Iveson Trophy): 1, J. Whitley; 2, G. Monk; 3, Master D. Lacey.

THE Annual General Meeting of the Brampton A.S. was held in January, when the following persons were elected to serve on the Committee for the coming year: Chairman, J. Collier; Vice-Chairman, D. Robinson; Joint Secretaries, Mr. and Mrs. R. Jones; Treasurer, A. Hunt; Show Managers, J. Irving and B. Hodgson; Press Officer, C. Hind; Librarian, G. Robinson.

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TWENTY members attended the January meeting of the **Barnesley T.P.S.** The Table Show was for Barbs, first and second prizes being won by A. Simpson and third prize by W. Duncan. The raffle was provided by Mrs. Deaves and won by T. Mellor and R. Healey. Meetings are held every second and fourth Tuesday in each month at the Albion Hotel and all new members can be sure of a warm welcome.

A NEW class of competition was introduced to club members at the January meeting of the **Ilford and District Aquarist and Pond-keepers' Society**, who were asked to furnish a standard 4 in. show jar as a miniature aquaria. There was a very good response and entries were of a very high standard. Result: 1 and 2, H. Berger; 3, R. Ruth.

The President, A. Stebbing, presented awards for the past year's competition winners. Annual Pondkeepers' Competition: 1, D. Woodley; Annual Home Aquaria: 1, D. Scaman. All Classes Table Shows: 1, W. Rowe; Best Egg-layer: 1, D. Woodley. New members are most welcome and details can be obtained from the Secretary, 103 Heath Road, Chadwell Heath, Essex.

THE **Independent A.S.** commenced the new year with a welcome back chat and are looking forward to the quarterly programme which promises to be very interesting with talks by Frank Tomkins, a film show, and the usual trophy shows.

The Independent meets each Monday at 7.30 p.m. at the Holloway Institute, Eden Grove, London, N.7, off Holloway Road opposite the Northern Polytechnic, and a warm welcome is extended to anyone who would care to come along to any of our meetings. The Secretary is M. Harth, 60 Liverpool Road, Islington, N.1.

A VERY interesting lecture on "Breeding Egg-layers" was given by Mr. S. Martin at the fortnightly meeting of the **West Cumberland A.S.** The talk was of practical value to all present. There was also a table show of Cichlids and the result was as follows: 1 and 3, R. Strand; 2, S. Martin; 4, J. Bamberworth. The provisional date for the inter-club show with Carlisle is 26th April and will be held at the High Duty Alloys Social Club Rooms, Distington. Meetings are held every other Tuesday and new members are always welcome.

THE best year on record both for membership and activity was how chairman Robin Johnson described the past year for the **Mid-Sussex A.S.** at their annual meeting. Membership, he reported, stood around the 100 mark. More than half the members were of the one-tank-in-their-front-room type, and they were the backbone of the society.

Vice-chairman Mr. David Soper said that at the inter-club show, when the society entertained five other clubs, the judge, Mr. Gannons of London, rated the fish as up to international standard. R. Smith (show secretary) considered 1969 to have been a successful year for the society. They came fifth at the Portsmouth inter-club show and second at Brighton, and they had won their own inter-club contest. There were 242 entries at table shows, and it was encouraging to note the junior support. He was sorry to see that the home aquaria was not of such a good standard as the previous year.

Officers elected were: Robin Johnson (chairman); David Soper (vice-chairman); John Reeve (secretary); Cyril West (treasurer); Ray Smith (show secretary); Mrs. L. Jeffrey, N. Short, J. Walker and A. Jackson (committee). F.R.A.S. representative, E. Speck; auditors, Messrs. E. Johnson and C. Corbin; publicity, Mr. and Mrs. C. Corbin.

THE **Yate and District A.S.** held their meeting as usual, but unfortunately the panel of experts who were to talk and answer questions were unable to owing to illness. In their place various members of the club gave a short

resume of their advances in the breeding of various types of fish.

The evening ended with a run around, all members present giving an account of their tanks, types and numbers of fish owned and thoughts and ambitions on future breeding and showing.

THE **Loughborough and District A.S.** held their third annual Dinner and Dance recently. Principal guest was the Loughborough Parks Superintendent, T. Stapleford. The Shield event winners were presented with their awards by Mrs. Stapleford and a presentation was also made to Mrs. M. Farnden for her hospitality to the committee members during the past year. Results of the Shield event was as follows: Livebearers: 1, M. Walker; 2, N. Vesey; 3, T. Parry; 4, F. Hopewell. Barbs: 1, 2, 3 and 4, M. Delaney. Anabantids: 1 and 2, I. Pandy; 3 and 4, M. Delaney. Characins: 1 and 3, T. Parry; 2 and 4, M. Delaney. Catfish and Loaches: 1, 2 and 4, N. Vesey; 3, M. Walker. Cichlids: 1, 2, 3 and 4, N. Vesey. Pairs: 1 and 2, M. Delaney; 3, D. Wood; 4, N. Vesey. A.O.V.: 1, N. Vesey; 2, D. Wood; 3, M. Delaney; 4, T. Parry. Fish of the year award was won by N. Vesey for a *A. Agassii*. Chapman Shield for most points at last year's table shows, M. Delaney.

A TROPICAL fish slide show was given to the **Gloucester A.S.** by one of the youngest members, Stewart Smith, who gave an account of each individual fish displayed. A quiz, the first the Club has presented, was well received, and it is hoped to prepare similar items in this field in the near future. As an additional item for members, a film show was presented and in spite of adverse weather conditions which prevailed at the time, 30 people gave their support. The films exhibited were: (1) Lake Maracalbo, (2) Pond Animals, (3) Portrait of Bermuda, (4) Carnival Under the Sea.

Recently, the members visited the Trout Hatchery at Bibury, Glos., where brown trout and rainbow trout were seen in profusion in large open lakes. Members were also allowed to see trout in various stages of development.

THE **Glossop A.S.** held their annual general meeting when the election of officers and Committee members was held. Chairman, R. Lee; Vice-Chairman, G. Miller; Secretary, Miss M. D. Smith; Treasurer, S. Rensstock; Show Secretary, R. Tomkinson; Committee members, Mrs. E. Newall, A. Newall, J. Mooney, A. J. West. A further committee member is to be elected at a later date.

RESULTS of Aquaria Section, Fur, Fin and Feather Show: A. Walthamstow D.A.S.; B. A. Chandler, Walthamstow; C. W. Woodhead; Ch. D. Goodbody, Walthamstow; Co. Mrs. G. Longstaff, Kingston; G. Mrs. J. Stott—Best C/W Fish in Show, Stone Loch; Cf. D. Pollock-Harlow; T. M. Parmenter, Walthamstow; Th. L. Smith, Hampstead; T. R. Stockwell, Hendon; T. H. Wood, Croydon; T. B. Mather, Walthamstow; T. G. Savage, North Kent; T. J. Gosser, Bethnal Green; Th. J. Gosser, Bethnal Green—Best Tropical fish and Best Fish in Show; T. A. Smith, Croydon; T. D. Day, Croydon; Th. R. Bowers, Walthamstow; T. M. Wood; T. T. Hands, Bethnal Green; T. L. Smith, Hampstead; T. P. Arnold, Bethnal Green; B. Mrs. G. Longstaff, Kingston; B. B. Mather, Walthamstow; B. P. Harrison, Chingford—Best Team of Breeders. The "Aquarist" Gold Pin was awarded to J. Gosser for his *Apist. Ramirezii*. The Inter-Club Challenge Shield was won by Walthamstow and District A.S. with 82 points, second being Bethnal Green with 26 points, third were Croydon with 21 points and fourth Kingston with 17 points.

THE Annual General Meeting of the **Witham and District A.S.** was held in January when the following officers were elected: President,

D. Malton; Chairman, D. Willett; Vice-Chairman, A. Gall; Secretary, M. Clayton, 165 Barnard Road, Galleyswood, Chelmsford, Essex; Treasurer, E. Nobes; Committee, Misses M. Brown, D. Brown, Messrs. R. Baldwin, M. Smith, M. Shelly. The meetings are held at The Albert, Witham, Essex, opposite the railway station, on the second Wednesday of each month. All new members can be assured of a warm welcome and those interested should contact the Secretary.

FORTHCOMING attractions in the **Bradford and District A.S.** include the Members Show, Home Aquaria Competition and Annual Dinner again this year. Nearer at hand, in March, it is hoped to have a recorded talk and series of slides produced by P. Robinson. On 1st April the Inter-Society Show will be held.

AT the last meeting of the Aquarists' section of the **Vauxhall Motors Recreation Club**, the chief item was a slide show and taped commentary on the setting up and running of tanks, mainly with show tanks in mind. This was a new venture for the section and most of the club members enjoyed it.

During January there was a match with Hetchley Club, and although this was lost, it was by a very narrow margin and the return contest is keenly anticipated. The show on club night was for Labyrinth, Danion and Harbora, with the following results: Labyrinth: 1, T. Jeffries; 2, E. Hughes; 3, J. Scrivenor; 4, G. Boughey; Danion: 1 and 2, J. Bains; 3, B. Webb; Harbora: 1, G. Boughey; 2, B. Carter; 3 and 4, M. Hawkes. The judge was J. Bains.

AT the February meeting of the **Bournemouth A.S.** members enjoyed a slide show and lecture entitled "An introduction to Cichlids." During the interval the Table Shows were judged by Les James, and the results were: A. V. Swords; 1, Mr. Cox; 2, R. G. Redley; 3, N. P. Brown. Breeders' Class: 1, R. Cox; 2, B. Walker; 3, E. Bull. After the interval a raffle took place, and to close the evening B. Coombes gave an illustrated talk about breeding some of the egg-layers.

EARLY in February the **Weymouth and District A.S.** held their Annual General Meeting when the following members were elected to office: Chairman, D. Rogers; Secretary, Mr. Rowlinson; Treasurer, Mrs. M. Rogers.

There was much discussion on the proposed Open Show, but as a good venue could not be found, it was decided to try and encourage more new members to join. The meeting place is the Labour Hall, Park Street, the first Tuesday in every month. All are welcome.

THE **Winchester A.S.** Open Show will be held on the 25th April in the Congregational Church Hall, Jewry Street, Winchester. The new Show Secretary is Derek Adlett, 1 St. Mary's Street, Stanmore, Winchester, and the new publicity officer of the Society is A. G. Smith.

THE **Torbay A.S.** recently had their Annual General Meeting, when retiring chairman, George Thompson, speaking to the members said that Torbay must be one of the fastest growing clubs in Britain. From eleven members in 1967 it now has 140 members and is still increasing.

Highlight of last year was the Torbay Society's first Open Show which was an out-

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standing success with three hundred entries in the single fish classes, and thirty furnished tanks entered by various aquarists. Preparations are in hand to surpass this at the next Open Show on 27th September. Another feature was the inter-club contests with Easter A.S. and Plymouth A.S. which gave members of each society a chance to show fish for their respective clubs.

The meeting was presided over by the President, Eric Perks, with the following officers elected: Chairman, J. Haynes; Vice-Chairman, R. Barnes; Secretary, D. Dodd; Treasurer, R. Hamlyn; Show Secretary, I. Doubleday; Press Officer, M. Poole; Librarian, Mrs. Ley; Committee members: Mrs. Poole, K. Palin, J. Bragg, J. Davis. Junior: Master Willcocks.

OBITUARY

The death is announced of Mr. Joseph Warcup, a long serving member of Hull A.S. He was a prominent fish breeder and aquarist of high standing and "Joe" did much to further fishkeeping in Hull. He will be remembered as a pioneer of the Society activities.

CHANGE OF NAME

The Bournemouth Aquarists Club is now known as "The Bournemouth Aquarists Society."

NEW SOCIETY

At the first meeting of the Carshalton and District A.S. (Surrey), the following were elected: T. West, Chairman; B. Gurr, Treasurer; E. Horsley, Secretary. Meetings will be held on the last Wednesday of the month. Please contact the Secretary, E. Horsley, 11 Palmerston Road, Carshalton, Surrey, for particulars of membership.

CHANGE OF VENUE

The Belfast Tropical Fish Society have now moved to new Club Rooms at Bloomfield Glenmoran Supporters Club, Greenville Road, Belfast. Meeting nights second and fourth Monday of each month at 8 p.m. New members made very welcome or please contact the Secretary, J. Brown, 65 Greymount Drive, Shore Road, Belfast 15, N.I.

SECRETARY CHANGES

Erith and District A.S.: Mrs. J. Squires, 30 Woodhurst Road, Abbey Wood, London, S.E.2.

Alfreton and District A.S.: M. Allsop, 161 Birchwood Lane, Somercotes, Derbys, DE5 4NF.

York and District A.S.: Mrs. A. Hargreaves, 87 Chapelfields Road, Acomb, York.

Loughborough and District A.S.: L. Astill, 23 School Road, Rubery, Birmingham.

A.M.D.A.S.: A. Newall, 157 Fog Lane, Dalbury, Manchester, 20. (Tel: 061-445 1655).

Loughborough and District A.S.: D. Wood, 35 Meadow Avenue, Loughborough, Leics.

Sheffield and District A.S.: K. Colton, 35 Delves Avenue, Sheffield, S12 4AA.

Blackpool and Fylde A.S.: G. Howard, 56 Stamford Avenue, Blackpool. Tel: Blackpool 42676.

AQUARIST CALENDAR

1st March: Keighley A.S. Open Show.

8th March: Huddersfield T.F.S. Open Show to be held at Cambridge Road Baths, Huddersfield.

21st March: East Dulwich A.S. Second Open Show at St. Barnabas Parish Hall, Dulwich Village, S.E.21. Schedules available from D. E. Sutton, 231, Friern Road, London, S.E.22.

22nd March: Top Ten A.S. second Open Show at the Huddersfield Town Hall, schedules obtainable from Show Secretary Mrs. B. Smith, 995, Manchester Road, Lintwhaithe, Huddersfield or Secretary, L. Kaye, 1, Totties, Scholes, Huddersfield.

29th March: Nelson A.S. Open, Nelson Civic Centre, Stanley Street, Nelson. Schedules from B. Tate, 12, Priory Close, Bingley, Yorks.

5th April: Stretford and District A.S. Open Show, A.E.I. Club, Moss Road, Stretford. Show Secretary, A. Stear, 65 Darbyshire Lane, Stretford, Lancs.

5th April: Houghton and District A.S. Annual Open Show. Details from J. Marriner, Secretary, 97, Sunderland Street, Houghton, Co. Durham.

11th April: Carlford A.S. Open Show, Carlford Boys' School, Stainton Road, Brownhill Road, Carlford, London, S.E.6. Schedules available from J. D. Wilson, 130, Paston Crescent, Lee, London, S.E.12. 01-857 4913.

18th April: Reading and District A.S. Annual Open Show, Brock Barracks, Oxford Road, Reading. Show Secretary, B. Grant, 20, Dover Street, Reading, Berks. Reading 53000.

18th April: Tharrock A.S. Third Open Show, New Venue: Arthur Street School, opposite the Society headquarters. Coldwater Classes included. Show schedules and information obtainable from D. C. M. Durrant, 22, Kingsman Road, Stanford-le-Hope, Essex.

19th April: Newton Aycliffe A.S. Show.

24th-26th April: Stockton-on-Tees A.S., Fifth Annual Show at St. Peter's and Pauls School, Durham Road, (A.177) Stockton-on-Tees. Schedules available shortly.

25th April: Winchester and District A.S. Open Show at the Congregational Church Hall, Jersey Street, Winchester.

26th April: York and District A.S. Open Show, Railway Institute, Queen Street, York. Schedules from Show Secretary, P. Carey, 29, Yearsley Grove, York, YO3 9BX.

3rd May: Derby Regent A.S. Open Show Sherwood Foresters Recreation Centre (Normanton Barracks) Osmaston Park Road, Derby, (Follow R.A.C. Signs). Show schedules from E. Hazeldine, 57 Tewkesbury Crescent, Chaddesden, Derby.

3rd May: Bury and District A.S. Open Show, The Church House (behind Parish Church), The Wyldes, Bury.

3rd May: Dukeries A.S. Second Annual Open Show at the Winifred Portland Technical Grammar School, Sparken Hill, Worksop.

3rd May: Newcastle Guppy and Livebearer Society First Open Show at St. Joseph's School, Atkinson Road, Benwell, Newcastle-on-Tyne. Schedules from R. Skyles, Secretary, 189, Fosway, Walkergate, Newcastle-on-Tyne 6.

10th May: Association of Yorkshire Aquarist Societies Annual Open Show. Full details later.

10th May: Accrington and District A.S. Open Show at St. John Ambulance Hall, Bull Bridge, Accrington. Details from G. H. Whitsey, Hon. Secretary, 47, Lymwood Road, Blackburn.

10th May: Workshop A and Z.S. Annual Open Show, North Notts College of Further Education, Blyth Road, Worksop. Schedules available shortly from J. W. Booker, Secretary, 30, Rufford Street, Worksop, Notts. Tel: 5009.

10th May: Hyde A.S. Open Show, Queens Hotel, Hyde, Cheshire. Secretary, B. Riley, 133, Manor Park Road, Glossop, Derbyshire.

10th May: Oram A.S. Annual Open Show Recreations Hall, Refuge Street, Shaw, Oldham. Hon. Secretary, J. B. Shore, 53, Refuge Street, Shaw, Oldham.

16th May: Southend, Leigh and District A.S. Open Show, St. Andrew's Hall, Electric Avenue, Westcliff. All enquiries to Show Secretary, Malcolm Upton, 12, Merrivale, Benfleet, Essex.

16th May: Uxbridge and District A.S. Annual Open Show at The Meadow School, Royal Lane, Hillingdon, Uxbridge. Show schedules available from N. V. Lee, 46, Airedale Road, Ealing, W.5.

16th May: Cardiff A.S. Fourth Open Show, "St. Margaret's" Church Hall, Roach Park, Cardiff. Details and schedules from Mr. and Mrs. C. Harding, 168 Pearl Street, Cardiff.

17th May: Merseyside A.S. Open Table Show.

17th May: Hendon and District A.S. Show Secretary, W. R. Sherwin, 43, The Highlands, Edgware, Middx.

30th May: Kingston and District A.S. Open Show. Schedules available from G. Greenhalf, 39, Clarth Close, Morden, Surrey. Tel: 01-337 4042.

30th May: Kingston and District A.S. Open Show. Secretary, H. I. Fairhurst, 37, Woodstock Avenue, Sutton, Surrey.

31st May: Coventry Pool and Aquarium Society Open Show, Foleshill Road Community Centre. Show schedules (S.A.E.) from Show Secretary, S. Wooldridge, 32, Ridgeway Avenue, Coventry, CV3 5BP.

7th June: Nuneaton A.S. Open Show. Schedules from S. Blaxham, The Shop, Beaumont Road, Nuneaton.

13th June: Llanrwit Major A.S. Open Show, Town Hall, Llanrwit Major.

14th June: Bournemouth Aquarists Club Annual Open Show. Further details to follow.

14th June: Loughborough and District A.S. Open Show, Town Hall, Loughborough. Show Secretary, I. Purdy, 61 Poplar Road Shelthorpe, Loughborough, Leics.

21st June: Swillington A.S. Fifth Annual Open Table Show at Swillington School.

25th-27th June: Bristol Tropical Fish Club Open Show at Congregational Church Hall, Newton Street (nr. Stapleton Road), Bristol 5. Details from E. Newman (Show Sec.), 71, Somerdale Avenue, Knowle, Bristol, 4.

28th June: Alfreton and District A.S. Annual Open Show, to be held at the Adult Education Centre, Alfreton Hall, Alfreton. Details from the Show Secretary, S. Hill, 35, South Street, Riddings, Derbyshire.

28th June: Northwich and District A.S. Open Show. Particulars of venue will be announced.

5th July: High Wycombe A.S. Open Show, West Wycombe Hall, West Wycombe, Bucks.

5th July: Lytham A.S. Open Show at Lowther Pavilion, Lowther Gardens, Lytham, Lancs.

5th July: Peterlee A.S. 9th Annual Open Show to be held at Edenhill Community Centre, Peterlee. Secretary, R. Davison, 7, Palmer Street, South Hetton, Co. Durham.

7th July: Lincoln and District A.S. Venue details later.

10th-12th July: Aquarist and Pondkeeper Fishkeeping Exhibition, Alexandra Palace, Wood Green, London, N.22.

11th July: Basingstoke and District A.S. Open Show. Details from A. Blake, 50 Bounty Road, Basingstoke.

12th July: Grantham and District A.S. First Open Show, Guildhall, St. Peter's Hill, Grantham. Schedules available mid-February from Show Secretary, S. Paver, 59 Alexander Avenue, Newark, Notts.

19th July: Barnsley Tropical Fish Society. Open Show. Venue to follow.

25th July: Plymouth A.S. Open Show, Sherwell Hall, Sherwell, Plymouth. Details from Show Secretary, R. Gartrell, 53 Biggin Hill, Ermslett, Plymouth, Devon.

31st July-1st August: Chingford and District A.S. Open Show, The New Road, Methodist Church Hall, New Road, Chingford, E.4.

1st August: Stroud and District A.S. Third Open Show, Archway School, Pagenhill, Stroud, Glos. Schedules and information from Show Secretary, P. L. K. Treadgold, 15, King's Road, Rodborough, nr. Stroud.

2nd August: Blackpool and Fylde A.S., New Venue, Arnold Boys' School, Lytham Road, Blackpool. Schedules from G. Howard, 56, Stamford Avenue, Blackpool from mid-June.

22nd August: Yeovil and District A.S. Open Show at Grass Royal Secondary School, Yeovil. Details from D. M. Phinn, 5, Hill Terrace, Bower Hinton, Martock, Somerset.

20th September: Four Star A.S. Second Annual Show. Further details available later.

27th September: Torbay A.S. Annual Open Show. Venue details later.

27th September: Hocknall and Balwell A.S. Third Open Show. Further details later.

4th October: Castleford and District A.S. Open Show at the Boys' Modern School, Pontefract Road, Castleford. Further details from R. Illingworth, 67, Dawtrey Street, Ferry Pryston, Castleford, Yorks.

10th-11th October: British Aquarist Festival, Belle Vue, Manchester.

8th November: Hartlepool A.S. Twelfth Annual Show, Longcur Hall, Seaton Carew. Schedules available September from J. D. Watson, 42, Sydenham Road, Hartlepool.