

December  
1969

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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  
£1 15s. 0d. Half-yearly 17s. 6d.

MSS. or prints unaccompanied by a  
stamped addressed envelope cannot be returned and no re-  
sponsibility is accepted for contributions submitted.



Founded 1924  
as 'The Amateur Aquarist'  
Vol. XXXIV No. 9, 1969

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### OUR COVER

Female (left)  
and Male Bitterling  
(*Rhodeus amarus*)  
with mussel

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The Editor accepts no responsibility for views expressed by  
contributors.

Editor: Laurence E. Perkins

December, 1969

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## BRITISH AQUARISTS' FESTIVAL

THE 1969 BRITISH AQUARISTS' Festival was held on 18th-19th October, at the large exhibition hall, Belle Vue, Manchester. More visitors attended than ever before and the exhibition goes from strength to strength. Once again the hall had been extended, now at its maximum of 580 feet, and in addition the adjoining hall had been opened to accommodate another refreshment bar with many tables enabling many more visitors to take a rest in comfort. The attendance on the Sunday was staggering and thousands of people thronged the hall enjoying the exhibits all day long. It makes one wonder where all the people come from as although many were coming and going most of the day, at all times the hall presented a sea of heads from the *Aquarist* stand.

The Federation of Northern Aquarium Societies had organised the show very well indeed and in addition the Champion of Champions class was a great attraction. The fishes competing had all won a best-fish-in-show somewhere and there were thirty-four entries on view. A very large Pacu won the Championship, and this was indeed a huge fish. When I quietly pointed my finger at it, it opened a great mouth and looked as if it could take my finger off if the glass had not been there. A scot came second and an *Apistogramma ramirezi* was placed third.

There were about thirty societies competing, each with their own constructed stand. These stands all came up to a

very high standard, being neat and compact. Each stand must include eight or more tanks and show at least one furnished tank. Many of the stands, although very attractive, were of a rather conventional type, but a few were very outstanding and showed much initiative. It was a difficult task for the judges to pick the leading four and one or two left out of the prizes came very close indeed. The winning stand was a splendid tableau entitled "Silent Worlds". On the left was a well set-up display representing a dense tropical forest and on the opposite side of the stand was an Arctic scene, complete with an ice-breaker, helicopter, motor sledge, huts with men on an ice cap. Above was a star-studded sky with the moon very prominent. Pointing towards it was an excellently constructed space craft, complete with many details. Beneath were the tanks of fishes. This up-to-date conception was a worthy winner. The stand which was placed second was a very large model of the Ark, complete with Noah, animals etc., including two chimps, and the heads of horned beasts sticking out from windows. This stand was at least 26 feet long and was a great attraction for visitors. The third prize was awarded to a treasure chest, which was very neat and compact. The fourth was a very good model of a villa, very pleasing and must have come very near to third.

The Bristol A.S. had a replica of the Clifton suspension bridge, and it was a pity that the effect was rather spoiled by a badly leaking furnished tank. Belle Vue, Manchester, exhibited an excellent drawing room scene which I thought was utterly spoiled by a tank on a stand which was completely covered with green artificial grass as seen on green-grocers' stands. This tank, with this covering on hood, angle irons and stand, was so glaring that it took the eyes away from the very well designed room. Another society had a large back-cloth of a forest and a water-fall ran from it to the front of the scene, a bold exhibit but colours were not quite true. A partly constructed building which was held up through "rising damp", was another good design and a crown with tanks inset all round was another good stand. Gorton and Openshaw had a very nice marine tank on display, one of the very few on show, and a novelty tank where many fishes were represented by varying models and visitors were invited to find names of fishes for the different objects such as a penknife, fish of silver paper, pearls, bleeding heart, etc. A very novel exhibit.



*1969 Show set new records for attractions and attendance*



Right: 1st Prize winner: Dewsbury Aquarist Society with their stand "Silent Worlds"



Bottom right: 2nd Prize winner: Noah's Ark constructed by Stretford Aquarist Society



There were hundreds of fishes on show and there was plenty to interest the tropical and coldwater fan. There were some excellent specimens among the tropicals and it would have been difficult to pick out special fishes from such a grand array. The coldwater fishes were in fair strength but I was informed by the judges that some of them were down-pointed badly because of the presence of fish lice (*Argulus*) on them. I had wondered why one fine goldfish had no prize when one next to it had taken a third, although a very inferior fish. I was told that the unplaced fish had a fish louse on it, not apparent when I saw it, but at least thirty points must have been deducted for this carelessness on the part of the exhibitor in not cleaning the fish before the show.

One would think that where good specimen fishes are concerned the owners would take a great deal of trouble to see that the fishes were free from pests before exhibiting them. Also I just cannot understand why some exhibitors in the Champion of Champions class do not specify that large tanks are required for their fish. A Gourami died because it was placed in a tank which was apparently too small for it. One wonders if the time will come when the size of fishes competing will have to be limited. I feel that the

**Price of "The Aquarist"**

It is regretted that because of increasing costs of production and distribution of periodicals, the publishers of "The Aquarist" have to increase the price of the journal to 3/-, starting with the January issue. Subscribers will be notified of the new rates when current subscriptions come to an end.

## British Aquarists' Festival cont.

hobby cannot hope to get more interest from the general public when very large fishes are shown in small tanks.

The dealers' stands made a grand display as usual and there were thousands of fishes for sale, some of which were quite new to me. There were tropical fishes to suit all tastes and there were many coldwater fishes for the enthusiasts in that branch of the hobby. I was interested and impressed to see some brassy coloured young lionheads for sale among which appeared to be some future winners. Every conceivable type of apparatus and food was on sale and the dealers seemed to me to be kept very busy throughout the exhibition. Many types of tank were on show and the various kinds of aerators and filters must have given the visitors much food for thought.

It was rather disappointing to find that there were so few marine fishes on show. There were two classes for these fish and not a single entry was received. Maybe it is because of the difficulty of providing filtration etc., for the fish tanks which put exhibitors off. I only saw a couple of marine tanks, the one on the Gorton stand being very good and provided a great attraction. It appears that marines still have a long way to go before they become as popular as the freshwater types. However, if anyone who visited the show was disappointed he must be very hard to please and I would venture to state that this show was one of the finest ever held in this country. *The Aquarist* stand was attractive with so many trophies on display and the experts were kept busy with many queries.



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From top to bottom:

3rd Prize winner: The neat and very compact Treasure Chest of Blackpool and Fylde Aquatic Society

4th Prize winner: The Model Villa entry by Leigh Aquatic Society

The very effective Clifton Suspension Bridge constructed by the Bristol Aquatic Society

Below:

Another outstanding exhibit, the Belle Vue Aquarist Society stand

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# CHAMPION OF CHAMPIONS

## Competition Results



**1st**  
**M. J. PARKER**  
**and D. B. GREENLAND**  
**Stretford & Dist. A.S.**  
**87 pts.**

**2nd**  
**R. B. MOORCROFT**  
**Merseyside A. S.**  
**80 pts.**

**3rd**  
**N. R. GIBSON**  
**Huddersfield A.S.**  
**78½ pts.**

### RESULTS OF OTHER FESTIVAL COMPETITIONS

Best Fish of the Show: G. Hammett (Ashton-under-Lyne) 85 pts. Best Tropical Fish: G. Hammett (Ashton-under-Lyne). Best Cold-water Fish: H. Jago (Bristol) 76 pts. Best Other than Best Fish in Show: Tropical Egglayers, P. Harrison (Loyne) 82 pts. Tropical Livebearers: J. R. Smith (Bradford) 81 pts. Coldwater: H. Jago (Bristol) 76 pts. Best Society Furnished Aquarium (Tropical): 1, Blackpool 76 pts.; 2, Halifax 74½ pts.; 3, Bury 71 pts. Coldwater: 1, Accrington 75 pts.; 2, Loyne 74 pts.; 3, Valley 73½ pts. Best Individual Furnished Aquaria (Tropical): 1, D. Shields (Halifax) 76 pts.; 2, B. Lintler (Blackpool) 73½ pts.; 3, Mr. and Mrs. Heap (Belle Vue) 72 pts. Best Individual Furnished Aquaria (Coldwater): 1, H. Smith (Accrington) 72 pts.; 2, B. Simmons (Blackpool) 70½ pts.; 3, R. Wagstaff (Northern Goldfish) 64 pts. Best Aquascape: 1, K. Boothroyd (Dewsbury) 77 pts.; 2, Mrs. Mathews (Northern Goldfish) 75 pts.; 3, Miss D. Smith (Glossop) 70 pts. Novelty Aquascape: 1, G. Mills (Gorton) 76 pts.; 2, M. Sciffe (Accrington) 72 pts.; 3, O. Sharkie (Lanarkshire) 71 pts. Common Goldfish and Comets: 1, B. Ramsden (Northern Goldfish) 74 pts.; 2, B. Ramsden (Northern Goldfish) 73 pts.; 3, Mrs. L. Baxter (Northern Goldfish) 68 pts. Shubunkins (Bristol and London): 1, H. T. Jago (Bristol) 74 pts.; 2, B. M. Rothwell (Northern Goldfish) 71 pts.; 3, B. M. Rothwell (Northern Goldfish) 68 pts. Moors: 1, B. Ramsden (Northern Goldfish) 69 pts.; 2, B. Ramsden (Northern Goldfish) 68 pts.; 3, H. Jago (Bristol) 85 pts. Veiltails: 1, H. Jago (Bristol) 76 pts.; 2, H. Smith (Accrington) 70 pts.; 3, B. Ramsden (Northern Goldfish) 64 pts. A.O.V. Fancy Goldfish (Fantails, Orandas, Lionheads and any "New" Variety): 1, C. Whinney (Accrington) 72 pts.; 2, H. Jago (Bristol) 71 pts.; 3, A. Isherwood (Accrington) 70 pts. Any Species of Coldwater other than those above: 1, J. Hooper (Bradford) 72 pts.; 2, S. Walsh (Accrington) 66 pts.; 3, Mrs. and Mr. Mills (Belle Vue) 67 pts. Guppies (Pairs): 1, A. Hubbard (Workshop) 70 pts.; 2, Mrs. M. Cobb (Belle Vue) 69 pts.; 3, A. Anderson (Lanarkshire) 68 pts. Guppies (Single fish): 1, Miss D. Smith (Glossop) 72 pts.; 2, P. Reynolds (Dukeries) 71 pts.; 3, V. Brothwood (Merseyside) 70 pts. Livebearers (Pairs): 1, J. R. Smith (Bradford) 80½ pts.; 2, A. Stear (Stretford) 77½ pts.; 3, P. Haggerty (Lanarkshire) 72 pts. Livebearers (Single Fish): 1, B. Thompson (Gorton) 80 pts.; 2, Mr. and Mrs. Heap (Belle Vue) 79 pts.; 3, B. Kirton (Wakefield) 78 pts. Angels (Pairs): 1, R. Tomlinson (Glossop) 72 pts.; 2, Leigh A.S. 70 pts. Angels (Single Fish): 1, J. McLean (Lanarkshire) 76 pts.; 2, J. Gresty (Sunnybrow) 74 pts.; 3, M. Fletcher (Glossop) 65 pts. Dwarf Cichlids (Pairs): 1, Mrs. M. Flith (Bradford) 72½ pts.; 2, R. Walker (Sheffield) 69 pts.; 3, A. Gleave (Stretford) 65½ pts. Dwarf Cichlids (Single Fish): 1, J. Brook (Wakefield) 76 pts.; 2, B. Haslam (Belle Vue) 72 pts.; 3, R. Taylor (Aireborough) 70 pts. Cichlids A.O.V. (Pairs): 1, J. Dornie

(Dukeries) 68 pts.; 2, Leigh A.S. 65½ pts.; 3, Mr. Crockett (Glossop) 58 pts. Cichlids A.O.V. (Single Fish): 1, C. Jones (Blackpool) 81 pts.; 2, R. Haslam (Loyne) 80 pts.; 3, K. Parkes (Merseyside) 79 pts. Fighters: 1, H. G. Kombar (Heywood) 73 pts.; 2, I. Boardman (Merseyside) 70 pts.; 3, J. Hill (Ashton) 65 pts. Gouramis A.V. and Paradise (Pairs): 1, K. Rawlinson (Leigh) 72 pts.; 2, Mrs. M. Cobb (Belle Vue) 71 pts.; 3, D. Sharkie (Lanarkshire) 68 pts. Gouramis and Paradise (Single Fish): 1, N. Gibson (Huddersfield) 76 pts.; 2, J. Westhead (Ashton) 74 pts.; 3, M. Woodley (Dukeries) 64 pts. Barbs (Pairs): 1, Mr. and Mrs. Grimshaw (Sunnybrow) 73 pts.; 2, S. Naismith (Lanarkshire) 72 pts.; 3, K. Parkes (Merseyside) 70 pts. Barbs (Single Fish): 1, M. Woodley (Dukeries) 70 pts.; 2, L. Dolman (Valley) 69 pts.; 3, A. Wild (Salford) 66 pts. Characins (Pairs): 1, A. Flith (Bradford) 78 pts.; 2, G. Hammett (Ashton) 76 pts.; 3, A. Chapman (Valley) 73 pts. Characins (Single Fish): 1, G. Hammett (Ashton) 85 pts.; 2, K. Parkes (Merseyside) 79 pts.; 3, P. Reynolds (Dukeries) 71 pts. Carps and Minnows (Pairs): 1, J. Burton (Huddersfield) 79½ pts.; 2, G. Gibson (Workshop) 72½ pts.; 3, O. Hodgkinson (Gorton) 71 pts. Carps and Minnows (Single Fish): 1, M. Pearn (Stocksbridge) 81 pts.; 2, R. Walker (Sheffield) 80 pts.; 3, R. Moorcroft (Merseyside) 79 pts. Catfishes (Pairs): 1, D. Jamieson (Lanarkshire) 80 pts.; 2, O. Sharkie (Lanarkshire) 74½ pts.; 3, S. Naismith (Lanarkshire) 72 pts. Catfishes (Single Fish): 1, S. Naismith (Lanarkshire) 78 pts.; 2, N. Spencer (Halifax) 75 pts.; 3, T. Hunt (Stretford) 74 pts. Egg-laying Tooth Carps (Pairs): 1, T. Bebbington (Stretford) 75 pts.; 2, D. Stetton (Wigan) 72 pts.; 3, D. Jackson (Dukeries) 68 pts. Egg-laying Tooth Carps (Single Fish): 1, J. Gresty (Sunnybrow) 79 pts.; 2, J. McGinley (Merseyside) 78 pts.; 3, Mrs. Wolstencroft (Heywood) 75 pts. Loach: 1, W. Low (Lanarkshire) 81 pts.; 2, P. Redmond (Sunnybrow) 78 pts.; 3, F. Mulla (Merseyside) 76 pts. A.V. Other than Classes above: 1, P. Harrison (Loyne) 82 pts.; 2, J. Dornie (Dukeries) 80 pts.; 3, D. Kennedy (Bradford) 78 pts. Breeders (Egg-layers): 1, J. Dornie (Dukeries) 80 pts.; 2, J. Holmes (Tadcaster) 79 pts.; 3, M. Hoyland (Stocksbridge) 77 pts. Breeders (Livebearers): 1, J. Wood (Bury) 77 pts.; 2, P. Haggerty (Lanarkshire) 76½ pts.; 3, S. Foley (Salford) 76 pts. Breeders (Coldwater): 1, H. Jago (Bristol) 80 pts.; 2, H. Jago (Bristol) 76 pts.; 3, B. M. Rothwell (Northern Goldfish) 72 pts. Plants: 1, S. Naismith (Lanarkshire) 80 pts.; 2, D. Jackson (Dukeries) 75 pts.; 3, M. Tunney (Stocksbridge) 72 pts. Best Marine Furnished Aquaria: 1, A. Harper (Gorton) 78 pts. Best Society Stands: 1, Dewsbury; 2, Stretford; 3, Blackpool; 4, Leigh. Society whose members won the most points: 1, Lanarkshire. Individual Exhibitor gaining most awards: 1, H. Jago (Bristol). Best Pair (Swordtails): N. Gibson (Huddersfield). Roses Shield: Lancashire.

# ROYAL FISH

By Henry Tegner

IN THE EARLY part of the present century the British Museum (Natural History) in the Cromwell Road, London, started a scheme for the reporting and recording of all whales stranded or beached on the shores of the British Isles. With the co-operation and assistance of the Receiver of Wrecks and the Officers of Her Majesty's Coastguard service comprehensive statistics have now been compiled of an extraordinary wide variety of the sea-mammals which are to be found within British waters. The Ministry of Transport had also to be brought into this nation-wide scheme, for they are the authority, under the existing law, which has to dispose of the carcasses of some of these huge animals. Whales, which include the dolphins and porpoises, are in law Royal Fish, as presumably when this law was originally passed whales were regarded as fish rather than sea-dwelling animals which, in fact, they are.

Broadly speaking whales can be divided into two classes, the so-called baleen or whalebone whales and the toothed whales. The latter category contains a wide variety of species from the very large sperm whale, whose teeth were in the past highly regarded for their ivory-like quality, to the much smaller porpoise which may often be seen today about many of our harbours and the mouths of our larger rivers.

The delphinidae, or dolphin family, consists of some eight species, one of which is the killer whale, *Orcinus orca*, which is also not infrequently to be met in the more northerly seas around this island's coasts. The killer has a reputation for ferocity; and is reputedly capable of devouring such large animals as grey seals, which can weigh several times as much as man.

Along the coast of Northumberland, where I live, I have come across both stranded porpoises and killer whales. The killers may well have been attracted to these shores by the presence on the offshore islands of the Farnes group of an enormous population of grey seals.

The porpoise which is undoubtedly the commonest of the lesser British whales is strangely enough not a member of the family delphinidae, but is the single representative of the family phocaenidae. The common porpoise is sometimes referred to as the Atlantic or Harbour porpoise, presumably because of this sea-mammal's apparent liking for harbours and sometimes inland waters. Porpoises have, on occasion, been observed in the river Thames well above the Houses of Parliament.

In the months of July and August I sometimes go out mackerel fishing from the little harbour of Newbiggin on Sea, not far north of Newcastle upon Tyne. Here frequently porpoises will follow a boat until almost grounded. Porpoises occasionally may become isolated in freshwater lakes and such occurrences may well account for the sightings of such monsters as that of Loch Ness.

To the eyes of a layman porpoises and dolphins in the sea look very much alike, but a closer examination will, at once, reveal marked differences in the species. The British Museum's excellent pamphlet *Stranded Whales and Turtles* shows good pictures of all the known species and is available at a small price for anyone interested.

In the past porpoises were very highly regarded as a table

delicacy, and in the time of the first Queen Elizabeth sea-pork, as it was called, was served with such edibles as heron and high venison. I have never tried porpoise, but I have sampled whale-meat and shark, and they are both capable of being served as delicious flesh provided that they are properly prepared in the kitchen by experienced cooks. The flesh of the porpoise is said to taste rather like pork, and the name of the animal is believed to have been derived from the Latin word *porcus* meaning swine.

The skipper of the Ellerman Wilson cargo-boat S.S. Bravo in which I once crossed the North Sea told me that porpoise blood mixed with flour made excellent black-puddings. The sausage-like black-pudding made with the blood of pigs is still a very popular food in many parts of the north country.

In the eighteenth century porpoises were generally referred to as sea-swine.

The Reverend John Wallis, at one time curate of Simonsburn in the North Tyne valley, wrote a voluminous work on the natural history of the region. He says of the porpoise that:

"The lesser Porpoise is frequent under the promontories and in the deep bays, upon the sea coast. They role and tumble on the surface of the waves like a parcel of swine. Hence it is generally called A Sea Swine."

I can confirm the curate's comment that porpoises are still plentiful along the shores of Northumberland. Only this past summer I came across a particularly large and very pungent porpoise on the shale beach by the mouth of the river Lyne. I paced this specimen to be just over six feet. Dolphins may run up to eight feet in length, but porpoises seldom go over the six-foot mark. On Christmas Day I found a perfect small porpoise of some four feet in length on the sands of Druridge Bay. This animal had been stranded and it must have died just before I arrived, as the sheen of life was still obvious on the skin. By its appearance and size this was a young beast.

In the past man hunted porpoises and dolphins for their flesh, but except in a few countries abroad where these sea-mammals still have an economic value man seeks these creatures no longer. However, certain members of the family delphinidae have a decided commercial value as sea-circus animals. The bottle-nosed dolphin in particular, can put up an astonishing variety of circus acts when kept in oceanariums. In confinement these animals have been intensely studied by scientists. Their I.Q. has been assessed, and the dolphin's has been placed between that of a dog and a chimpanzee. Where the porpoise would come is not yet known, but one would imagine not far behind the bottle-nose.

Porpoises and dolphins are well known to consort deliberately with man and his boats. Schools of both animals frequently accompany liners and fishing boats considerable distances, playing around the bows of vessels as if they were enjoying some sea-game. Possibly the most quoted instance of the dolphin's affinity to mankind is the case of the famous Risso's dolphin who came to be named Pelorus Jack. Pelorus Jack used to escort ships sailing between the North and South Islands of New

Zealand for nearly a quarter of a century until he disappeared.

Colin Taylor, the Curator of the marine oceanarium in Port Elizabeth, South Africa, has made a study of the dolphins' language. They communicate with one another in a series of squeaks and grunts, and their method of conversation is evidently by some form of sonar or echolocation; there appears a link here with the bat's system of finding its way about in the dark by radar.

The lesser whales are fast in the water and mainly seem to rely on their speed for safety. Normally, if attacked by shark, or their elder brethren the killer whales, they will race for it. On occasion, however, porpoises and dolphins have been known to use guile to beat these predators.

## PRODUCT REVIEW

"Fish-E-Quip Products," produced by Fish-E-Quip Ltd., 2 Shrewton Road, Tooting, London, S.W.17.

I felt like a child at Christmas, the other day, as I unpacked a parcel of twenty-three new aquarium items, forwarded to me for review by the Editor. The products were in the Fish-E-Quip range, and it covers quite a wide area of needs for the aquarium keeper.

The following are the items which I received: Foods—"General Fish Food," price 3s. for a 1 oz. plastic drum—analysis protein 45%, oil and fat 15%, carbohydrates 30% and mineral salts and fibre 10%, the food being prepared from meat and vegetable products; "Snow Flake Fish Food" price 3s. for 1 oz.—analysis protein 22%, carbohydrate 65%, mineral salts 4%, fats 4% and moisture 5%—suitable for all types of fish, especially small live bearers; "Hi-Protein" fish food is granular, and based on a famous trout food, prepared to stimulate healthy growth—analysis is 42½% protein; "Wheat Germ Flake" is also 3s. per 1 oz. drum, contains vitamin E, thiamin and riboflavin, but no quantitative analysis is given on the label; "Freeze Dried Whole Tubifex Worms" cost 5s. 3d. for about ½ oz., contains approximately 50% protein, and are fine, loose red worms which can be fed straight to larger fish or, as with other foods, crushed smaller for smaller fish; "Brine Shrimp Eggs" cost 2s. 6d. for a 3 gram. vial, and gave a good and quick hatch at 80°F. A larger size costs 4s. 6d.

Fish-E-Quip produce three bottled remedies, and three remedies in powder or tablet form, in small vials. What I liked about these was that the labels stated their contents. This is useful as, if a cure fails, one can try another one and know what has failed the first time. With unlabelled cures one is working, virtually, in the dark. The liquid cures are supplied in dropper bottles. ½ fl. oz. of Methylene Blue, a 5% solution, costs 3s. 1d. and can be used to treat white spot and fungus infections. ½ fl. oz. of Mercurochrome, a 1% solution, costs 3s. 1d. and can be used to treat white spot and wounds. ½ fl. oz. of "General Disinfectant" costs 3s. 1d. and contains tetramethyl thionine chloride and proflavine hemisulphate, in a normal saline solution. It can be used for quarantining new fish, for treating white spot, and velvet disease, for washing tubifex worms and for preserving fish eggs. The remedies in small vials are "Chloramina" white spot and fungus cure, costing 3s. 1d. for 3 grams; "Anti-Chlorine," which costs 3s. 6d. for 5 grams, and is sodium thiosulphate; and "Water Clarifier Tablets," which contains six 5-grain tablets of potassium permanganate which, being an oxidising agent,

When attacked by a shark a school will split, one member allowing itself to be pursued whilst the others keep on ramming the shark with their hard, powerful snouts until the fish is battered to death.

The survey of stranded whales conducted by the British Museum has shown that nearly all the dolphins at some time or other come to the seas around our islands, even such comparatively rare species as the white-whale, Euphrosyne dolphin, and the narwhal or sea-unicorn, have been found stranded. It is of interest to note that the records show that the bottle-nosed dolphin, at present the chief sea-circus performer, has beached itself almost as often as the Common or Atlantic Harbour porpoise, a very common little whale, indeed.

helps clear cloudy and green water in ponds and aquaria.

The firm also supplies three different kinds of salt for use by the aquarist. These consist of 4 oz. polythene packs at 1s. 4d. each. "Sea Salt Crystals" can be used for the treatment of fungus and wounds in fish; "Fine Salt" is used for the hatching of brine shrimp eggs; and "Tonic Salt Beads" are used for adding to coldwater or tropical tanks.

For the filter, Fish-E-Quip have produced a range of items costing 2s. 6d. per carton. These consist of: "Terylene Filter Media," "Glass Silk," "Glass Filter Mat," "Filter Charcoal" and "Peat Fibre." (I had thought that glass filter materials had gone out of fashion of late. I tried the two glass media in filters and they gave good results but I did not like handling them and would rather use synthetic filter wools such as the Terylene filter medium.) The peat fibre is interesting in that it can be used in a variety of ways, e.g., under aquarium gravel to help plant growth; in the filter to render the water brown and acid; it can be boiled and the resulting liquid added to aquarium water; it can be used on the base of bare tanks to provide cover for eggs of such fish as killifish; peat left after boiling can be mixed with filter charcoal and used as a medium for white worms or grindle worms; or it may be used for indoor gardens. "Fine Activated Bone Filter Carbon" is available at 1s. 9d. The small grains provide a larger active surface area.

Two other items which were sent by Fish-E-Quip, one from "Johnson's Aquarium," the retail branch of Fish-E-Quip, is "Johnson's Hardness Test Kit." This is for testing water hardness and consists of four graduated test tubes and a dropper bottle of what appears to be a special soap solution. Water is measured into the tube and indicator solution added. The tube is shaken after each addition until a ¼ in. froth is obtained. Each drop of indicator solution added equals one degree of Clarke hardness. The kit costs 10s. 6d., indicator solution refills cost 4s. 9d.

The last item is "Live Daf," which consists of a polythene bag containing 1 gram of fresh frozen daphnia. The daphnia is guaranteed to be free from harmful material. For top feeders the "Live Daf" is sprinkled on the water surface, and for bottom feeders it may be shaken up in a little water to which a trace of common salt has been added, and then placed in the aquarium.

An interesting and wide range of new products!

B.W.





## STRANGE CREATURES FROM THE SEA

By Henry Tegner

ABOVE THE WATERLINE, where the sea's froth eddied and bubbled on the beach, there stretched an endless band of white which finally disappeared, in the distant sea-haze. The white necklace on the sand, by the water's edge, was composed of the still-wet bones of myriads of cuttlefish. They varied in size from an inch or two to nearly a foot in length but none of them was the relic of a really large cuttlefish. These strange golgothas of cuttle-bones occur but rarely along our shores and when they do erupt from the sea they seem to do so after a prolonged cold spell when the temperature of the water drops below normal. These cephalopods appear to die from cold as other creatures will in other elements.

The cuttlefish, in company with the octopus and squid, is a member of the cephalopod family, an offshoot of the molluscs which contain such varied species as the cone-shaped limpet shell and the giant squid which on occasion can well surpass the height of a full-grown man.

Not a very great deal is yet known about these queer living things and the biologists are amongst the first to admit this fact. Recent marine explorations have brought to light

a number of new varieties. This is perhaps not very surprising when one realises that three-quarters of the globe's surface is under water and much of this area has, as yet, not been explored.

Cuttlefish, which in life are torpedo-shaped and have tentacles, usually inhabit the bottom of the sea and, like the dab and sole, they can camouflage themselves most effectively amongst the sand. This mollusc does not attain any great size, at least, along our shores, whereas its close relative the squid has been found stranded on Britain's northern coasts which measured many feet. It was only comparatively recently that man found that some squids could fly through the air like a jet plane. The crew of the world-famed *Kon tiki* expedition noticed and duly recorded this phenomenon. Squids, on occasion, have landed on sailing vessels. These sea-hikers have been small specimens unlike the giant squid, named ARCHITEUTHIS, which came on shore near the Bay of Nigg in Aberdeenshire and which tapered over twenty feet from the tip of its head to the end of its tentacles. In spite of its great size the marine biologists have diagnosed this specimen as a juvenile so that one might

expect an adult to eventually assume even larger proportions. So far as I can find the biggest known squid has reached a size of just over 50 feet; this is ten times the length of a normal man. I think it likely that it has been some of these mammoth squids which have been responsible for the sighting and legends of so-called sea-monsters. The Norwegians, across the North Sea, have a mythical sea beast known in ancient lore as the *Kraken*. The *Kraken* was supposed to grasp its victims in its tentacles eventually to drown them. This coupled with the *Kraken's* alleged size adds up, in my mind, to a giant squid.

The octopus, in contrast to the squid and cuttlefish, is a comparatively flabby animal which lives by stealth and cunning. Although soft and flaccid it has a powerful beak like a raptorial bird's with which it can inflict a painful wound. Octopuses, as their name implies, only have eight tentacles against the squid's ten; both the limbs of these cephalopods are equipped with little suction discs with which they attach themselves to their victims. In this country the octopus does not attain any great size; a large one could be compressed into a pint tankard. In the Pacific seas, however, they grow to a considerable size. Artists with appropriate imagination have depicted octopuses attacking boats and bathers. There is one famous oil-painting, which used to be in the old church at St. Malo across the English Channel, which shows a boatload of seamen being engulfed in the great trailing limbs of a

ferce-looking octopus. The survivors of this episode are supposed to have dedicated this illustration to the church. Japanese artists have also recorded some remarkable scenes involving these outsize cephalopods and there is in existence one picture in particular which shows, in glaring clarity, a great monster grasping towards its menacing beak a half-naked female pearl diver. The unknown artist has certainly put on paper the terror in the female's eyes and a savage lust in those of the beast.

The eyes of all the cephalopods are large and protuberant with good vision and some of them are quick-change artists, like the proverbial chameleon, being able to assume the coloration of their marine backgrounds. They can all squirt a dark fluid, known as sepia, with which to conceal themselves in the water and they all progress by that most modern form of travel, jet propulsion. It is the power of the squid's jet which sometimes enables him to hitch a lift on a passing boat.

The great number of beached, dry cuttle bones I came across on the sands were really tiny specimens and quite useless for any purpose but surprisingly these salt-impregnated, chalk-like cuneiforms when scraped from their shell-like bases make a most excellent and pleasant tasting tooth powder. When whole they are always greatly appreciated by nearly all caged birds, so if you have a pet budgerigar and find a nice cuttle bone give it to her, she will be sure to appreciate your gift.

## FISH IN ICE

ABOUT THIS TIME of the year most pond owners start their annual battle with ice and it is as well to recognise that once freezing conditions have set in, the ice will win (have you ever tried to wash your car, even with warm water when the thermometer has sunk below 32°F?)

I have been through the ritual many times of breaking the first thin layer of ice with my foot and freezing my hands throwing out what pieces I could get hold of, followed the next day by the refreezing of the surface and rebreaking of it; only this time it is thicker and reinforced not only by lumps of the first ice frozen in sideways but by the tops of pond weeds also frozen in. Removal is difficult and often plants are uprooted.

This process continues until even the coal hammer delivering lethal pressure waves to the fish makes no impression on the ice. The wise pondkeeper, having well fed his fish in the autumn, is not so concerned as he knows that most fish are quite happy under ice provided they have room to move and are not too long entombed.

However, when one year I found my 8 in. goldfish were confined to an ice cell about 15 in. square and it was still freezing, I became alarmed. The ice was too thick to break so I tried pouring hot water on the top. This quickly spread over the surface and proceeded to freeze. I considered a blow-lamp but then had the happier idea of a pail.

I chose an aluminium one that had a round base and no rim.

This I filled with boiling water and stood on the ice above the fish. After leaving for a few minutes I rotated the pail and by the time it was cold I had a  $\frac{1}{2}$  in. depression

By P. Weightman

in the ice. After refilling the pail with boiling water about four times and constantly rotating it, it had drilled a 9 in. diameter hole down to the fish and, moreover, the swimming space seemed to have enlarged.

After this it was easy. When new ice formed one only had to deal with a thin pail-sized crust which could be melted in a few minutes.

My advice therefore is never break ice—just borrow a pail.



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# A REVIEW OF THE SEASON



By A. Boarder

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THE 1969 BREEDING SEASON has been a very good one as far as the weather has been concerned. The sunny spells during the summer months has hastened the colour change of the scaled types of goldfish. The warmth has also meant that where a breeder uses some form of artificial heating for hatching and rearing, much less heating has had to be used than if the weather had been colder. It has also been noticeable that very small goldfish have changed colour when under three months of age. This would hardly be possible to achieve during dull seasons. Although warmth will help the colour change I think that sunshine also plays a very

important part. The growth of the young fish has been exceptionally rapid as they have eaten much better and consequently grown faster than they would have done in cooler conditions. It must also be realised that the growth is greatly affected by the space in which the fry have had in which to move around.

March and April did not give many bright days and several frosts were experienced even late in April. A few sunny days occurred in the month of April but my pond water did not warm up at all and the pond fish made no attempt to spawn. I had a pair of old fantail goldfish in a concrete tank in an outdoor frame. As they were so old and getting very sluggish I put them inside to see if they would brighten up. It is at about the spring time that many older fish become sluggish and are then prone to contract fungus disease or fin-rot. The pair showed little interest in food and remained very quiet. Slight aeration was supplied and the water temperature raised to 60°F.

On the morning of the 30th April, I noticed that the male fantail was lying beside the female and knocking her with his head. Knowing this to be one of the signs of spawning, I examined the plants in the tank and noticed many eggs already laid. The pair were then removed to another tank where a few more eggs were laid. The temperature in the first tank was raised to 64°F, and the aeration continued. On 4th May, some fry had hatched out, but there were many infertile eggs. The infertile eggs turn a pearl colour within about 24 hours and then after another day they become quite cloudy and mouldy. At this stage the aquarist may be forgiven for thinking that no eggs are likely to hatch at all, as one can see nothing but infertile eggs. This is because these show up very plainly, whereas the fertile ones remain very clear and almost transparent so that it is difficult to see them. However after the beginning of the third day a close inspection will usually show several eggs with the embryos showing up quite plainly. A magnifying glass is very useful at this stage as it will sometimes show the embryo moving in the egg.

On 4th May, the fry were plainly seen occasionally swimming to the surface and then resting on the sides of the tank or on water plants. The fry swim to the surface soon after hatching and I think that this may be to fill their swim bladder but I have no proof of this. All I am sure of is that it appears that the fry must get to the surface almost as soon as they hatch, but do not seem to have to do so again. Liquifry had been introduced into the tank a day before hatching was expected, so that infusoria might form in time for the fry for their first feed. On the 7th May, some of the fry were moved to other tanks as there appeared to be far too many in the tank for them to develop properly. The tanks I use are 24 x 12 x 9 in. outside measurement and about half an inch thick. The fry are moved by dipping a milk saucer gently into the water and carefully lifting it up with the fry. The water with fry is then carefully emptied into the fresh tank.

I do not like this fry moving procedure at this early stage as I am sure that many fry do not survive. However it would not be possible to rear all the fry in the one tank and so even if many of those removed are lost it may mean that more of those left behind have a better chance of survival. At a later date I had a very heavy hatching in one of the concrete tanks and it was obvious that I could never rear the majority of them. I took a small saucepan and made one careful dip into the tank. As the fry were gently run into

other tanks they were counted. In this one dip I had two hundred fry. There must have been many hundreds in the tank for the number I had caught to be in such a small area.

Now although every care was taken to see that the temperature of the water in the fresh tank was about that of the hatching tank, and matured water was used, I could only see a very few fry in the two tanks into which they had been emptied. I have noticed this on many occasions before and it appears that the fry react most strongly against any moving when they are very small. With every care to try to imitate the new conditions to the old ones, it seems that many fry die very soon after the move, although every effort has been made to keep the disturbance at a minimum. I would be very glad to hear from other breeders who have experienced the same trouble and if anyone can suggest a remedy I shall be most grateful. I realise that it would be very unlikely that one could rear all the fry from a large hatch but for all that I would like to know why it is that so many die when moved to other tanks.

My usual procedure is to anchor nests of water plants, usually Hornwort, at the breeding shallow part of my pond. When plenty of eggs are seen the bunch is placed in a hatching tank and another bunch of plants put in the pond. It often appears that only a fair number of eggs are seen at this stage and yet hundreds of fry can eventually hatch out. I feel that the only way of ensuring that too many fry are not in the hatching tank is to divide the bunch of plants so that only a small portion is placed in each tank.

When I have had only a small spawning with few fry hatching out, I have noticed that they grow at a much faster rate than would others which were crowded. As I have emphasised in many previous articles all the warmth, food and oxygen will not make the fry grow if they are overcrowded.

Up to the 13th May, the fantails in my pond had showed no signs of spawning and on that day it became very hot, being 83°F in London. As the weather seemed more settled I put three young 1968 bred fantails in the pond. These were a few of the pick of the years' breeding. The following day I noticed that the young fans were chasing some of the others and on the morning of 15th May, spawning was taking place very vigorously. It is quite probable that the introduction of the fresh fish into the pond set off the spawning. The temperature of the pond water had not risen very much and was 54°F, when spawning took place.

Spawning continued vigorously all the morning and also on the following day. Hundreds of eggs were seen and removed on the water plants to hatching tanks. This large number of bunches of plants with eggs meant that several tanks were in use and some of the older fry were placed in outside tanks. These were old cold water cisterns which I had treated and had been sunk into the ground. In addition I had obtained a number of large sheets of plate glass, secondhand, which I laid over these tanks. I found that this glass attracted the warmth from the sun and the water was always several degrees higher than that outside these tanks. During last winter many young fish of the season's hatching had wintered in these tanks and the glass appeared to help keep the water from freezing as thickly as it did in the pond.

It was noticed that the fry hatched in four days with a water temperature of 68°-70°F, but some eggs which had been placed in an outside tank, unheated, took eight days

to hatch. If 70°F can be maintained then it is possible to get a quick hatch which means that any pests which might have been present among the water plants would have less time to search out the eggs. After the heavy spawning on May 15th no more took place in May, June or July, and not until 29th August, did any more spawning take place. This was the result of the cleaning out of the pond consequent to the treating of it with Pondseal. All through the previous months the fish showed no inclination whatever to spawn and I am sure that this was because of the condition of the water. In the first place it was very green with algae. I keep my pond as a spawning pond and so do not have as much water plant life as I would have if the pond was purely ornamental. I only have plants in the spawning corner so that I can collect the eggs. In an ornamental pond with sufficient water plants eggs could be laid all over it and so be lost.

The pond was emptied and cleaned out on the 21st August, and the fish placed in tanks and my small pond. After the pond had been treated with Pondseal, washed and refilled, the fish were returned on the morning of 27th August. On the 29th they were all spawning most vigorously. I could hear them from my bedroom before 6 a.m. and one would have thought that a small dog had got into the pond. Hundreds, even thousands of eggs were obtained and my tank capacity became strained. However many of the fry from the earlier hatchings had started to change colour by the middle of July and these were placed outside in the cisterns.

During the whole season the only food given has been Liquéfy and fine dried flake food. I have an old type coffee grinder and this is ideal for reducing flake food to a fine powder which is taken by the fry when they are just over a week old. So far no white worm has been mashed for the fry, but once they are big enough to take it, some white worm is chopped up finely with a razor blade on a piece of board, or the worm shredders are used.

Lessons which I have learned during this season are first that spawning can be encouraged by introducing fresh fish and that it will happen usually when very fresh, and secondly when well oxygenated water is introduced. A point emphasising what a change of water can do is that when five large fantails were placed in one of the 80 gallon cisterns, they spawned heavily, although many of the eggs were found to be infertile, perhaps because there was no heating in the tank and it was fairly deep. However many fry eventually hatched out in this tank. I had no knowledge of this spawning until I took some Hornwort from it for making a fresh nest, only to find hundreds of eggs already there.

What surprised me this season is the fact that the last heavy spawning which took place on 29th August, and the fry were hatching on September 1st. I went away on holiday for nine days on the 2nd September, and had to leave the fry with no attention whatever, except that I put some Liquéfy into the hatching tanks before leaving. On my return I found hundreds of fry and there was no evidence that any had been lost. I had naturally worried that there would not be sufficient food for them during this time, but everything appeared normal in the tanks. I never get anyone to feed any of my fish whilst away on holiday for a fortnight, and have yet to lose a fish during the period. No extra food is given before leaving. On the whole my breeding season has been quite successful and I have never had youngsters change colour so early in all the years I have been breeding fantails, thirty-two years in all.

# FRESHWATER PERCH

*Junior  
Aquarist*

By Terry Jennings

THERE ARE ONLY two species of the family *Percidae* to be found in British freshwaters, and of these the perch is by far and away the most common and widely distributed. This deep-bodied and slightly hog-backed fish is equipped with two dorsal fins, and being a predator it has teeth in its extremely large mouth.

On handling a perch, the most noticeable features are the roughness of the skin and the sharpness of the fins. The roughness is due to the scales which have sharp edges and project through the skin. The first of the dorsal fins is supported by sharp spines and the second is of soft rays supported by two spines. The imposing spiny dorsal fin bristles defiantly when the fish is in danger and when it attacks its prey. It is advisable, therefore, to use a net when handling a perch for this sharp, prickly fin can cause the unwary considerable pain.

In their natural habitats most fish are not easily recognisable as their colouring blends with that of the surroundings. The perch, however, is a past master in the art of disguise. Its general body colour is olive-greenish, becoming darker in the dorsal region and lighter on its flanks. It is silver ventrally. The spiny dorsal fin has a black spot at its extremity, while the fins on the lower part of the body are tinged with red. With light shining from above the ventral region is in shadow and the whole fish tones in with aquatic plants and the muddy bottom of the water. The dark vertical bars, four to eight in number, tone with the upright leaves and stems of the plants, while the anal and pelvic fins, which are also in shadow, are relatively inconspicuous. In an aquarium, however, the perch is without doubt one of the handsomest of our native freshwater fishes.

In their natural environment perch have no need to gather



in a shoal for the purpose of spawning. They are already gregarious, although a shoal may be joined by a few of the larger specimens which are normally solitary.

Spawning takes place during the spring when, from March to May, the shoal moves to a stretch of shallow water, where the bottom is of gravel for preference, but contains plenty of aquatic plants and reeds.

The eggs, covered in jelly, are laid in a long mucilaginous string or ribbon, the end of which becomes fixed or entangled on a plant stem so that, as the female moves forwards in a series of jerks, the line of eggs is drawn from her body and the male fish secretes his milt over them.

During the spawning period, the adult fish may be seen spawning along the weeded edges of a lake or pond. A day or so later the milky-white floating ribbons of eggs will be clearly visible. Because of this they suffer greatly from the depredations of most other fish and many water-birds. Sometimes it would appear that the eggs cling to the feet and legs of wading birds and are thus carried to new stretches of water.

In spite of the many hazards, however, countless eggs survive and these hatch out in about two or three weeks, depending upon the temperature of the water. The perch fry sink to the bottom where they remain for about four weeks.

Being, like the adults, of carnivorous habit, the fry feed on live food consisting of insect larvae, small crustaceans, worms, etc. When they have grown large enough to do so, the young perch pursue and catch small fish.

Normally the fry develop rapidly and in twelve months they are three to four inches long. When they are three years old they start to spawn.

During the war, millions of tiny perch, averaging about 1 oz. each, were regularly trapped on Lake Windermere by the Freshwater Biological Association in an attempt to reduce the teeming multitudes of these fish. The perch were canned by a commercial firm and marketed under the name "Perchines". Over a period of five years some eighty tons of the fish were trapped, but the public did not apparently accept this new addition to their diet with any enthusiasm, in spite of the stringencies of the time. If nothing else, this experiment did give some indication of the vast numbers of perch in the lake.

There are numerous other lakes, ponds and gravel pits in this country which are also swarming with tiny perch; invariably these fish are of stunted growth. Probably this is a result of lack of food, and interbreeding over a long period.

The aquarist who wishes to keep a few perch may go to his local lake, pond or gravel pit, and catch them quite easily. Or he may prefer to approach an angler who will often hook small perch which are, as already indicated, common in any sluggish stretch of water.

A shoal of six or more should be kept in a pond or large aquarium. Because of their carnivorous nature other small fish (less than 3 in.) should not be included. The protective coloration of the perch means that the fish will not be seen very often in a pond unless the water is crystal clear, but in aquaria, which should preferably be at least 36 in. x 15 in. x 15 in., their beauty may be appreciated to the full.

Whether they are kept in an aquarium or garden pond, perch need a good supply of animal food. This may consist of worms, maggots, shredded meat, and any live fish small enough to be swallowed. Needless to say, any un-

eaten food, other than small live fish, should be removed as soon as possible lest it pollutes the water.

Larger perch will feed solely on minnows and sticklebacks. Unfortunately, if no small fish are available by the time the perch are about five inches long they remain small and stunted.

Although there are many ponds full of perch weighing a couple of ounces each, some waters hold two- to three-pounders. In fact the heaviest perch ever, from Lake Bala in Wales, turned the scales at ten pounds, another of nine pounds was caught in the Serpentine in Hyde Park while an eight-pounder came from the Wiltshire Avon. A weight of about five pounds seems to be the normal limit by fair angling. However, no matter how well kept and fed they are, aquarium perch never approach any of these weights!



## PRODUCT REVIEW

Two HYKRO filters, the "Hykro Crystal Outside Aquarium Filter" and the "Hykro Power Outside Aquarium Filter," are made by "Hykro" of Denmark, and distributed by Mr. Joe Grassby, The Hykro Depot, Moberley, Cheshire.

These two filters are excellent for the aquarist who wants a filter which is more powerful than the standard old air-lift filter which works on a stream of single, small bubbles. Some of the more modern filters now use an air stone to produce a much better air lift and, hence, a better water flow through the filter. The "Crystal" filter makes use of an air stone, and the filter air chamber return-tube is constructed so that the air bubbles are compressed and this ensures that the filter works at a rapid speed. The siphon tube of the filter is quite wide and is supplied with a siphon starter to ease the starting of the siphon, when the filter is set up. The bottom of the siphon has a well-designed strainer which allows dirt through, but keeps small fish out. Costing 21s. the "Crystal Outside Filter" is, I consider, very good value for money, and is suitable for standard sizes of aquarium, e.g., 24 in. x 12 in. x 12 in., and possibly, even larger. This filter is almost identical to an American filter which costs more than twice as much.

The "Hykro Outside Power Filter" costs 25s. 6d. and is also air powered. Its method of operation is original, and may be unique, at present, as I have not seen the system used on any other filter—yet. The filter box, like that of the above filter, is quite large, and has a layer of about 2 in. of activated charcoal placed on the base. This is covered with about 2 in. of filter wool. Up to this point, the setting-up process is the same as the above filter. With the "Hykro Power Filter," one then fits a return tube to the bottom of the filter. This curves up to hook over the aquarium frame. The air tube is fitted about one-third of the way up this tube, and the wide siphon, identical to that described above, is started. When the air pump is connected, the large bubbles carry filtered water quickly back to the aquarium. The filter gives quick and efficient filtration, at a reasonable price. This filter is suitable for quite large aquaria.

With both filters, having a quick water turn-over, the filtering media should be changed at frequent, regular intervals, to ensure maximum efficiency. B.W.

# A HIGHLY INFECTIOUS DISEASE

Junior  
Aquarist

By P. Long

I BECAME ACQUAINTED with this illness when I was in my early teens some fifteen years ago. My Father was the first member of the family to succumb but within a few hours, the whole family was infected. I am now wondering if there is a hereditary factor in the transmission of the disease as my own children are showing typical symptoms.

It was in the early fifties when I had my introduction to what we call "The Bug". Father was away on a business trip and telephoned to tell us that he had been delayed but would be home late the next evening with a surprise. Naturally we all awaited his return with anticipation and sure enough he arrived home late that Friday evening showing all the signs of having caught "The Bug". His eyes were rather glazed and he was enthusiastically talking about his new acquisition—a large vacuum flask containing some tropical fish.

With an air of excitement, we assembled that night to see these rare and wonderful creatures that Father had brought home with him, little realizing the impact they were going to make on our lives. On top of the sideboard there now stood a small tank of bubbling water full of bright green weeds showing no signs of life except for the curious gaze of an elegant brown snail which waved its tentacles at us as we banged and tapped on the glass. It was explained to us that Father had bought a second-hand tank of White Cloud Mountain Minnows and that these delicate creatures had to live in specially heated water and be fed on little red worms from the local sewage outlet. It was obvious to his unappreciative family that Dad had gone completely mad! Minnows we knew lived in cold water like the lake in the park and they were drab little brown fish which we often caught and kept in jam jars on the kitchen window-sill. After a few days they always died and the white, bloated corpses were thrown away to make room for the next "catch". However, to keep Father happy, we sat down to watch these minnows which had caught Father's imagination so much and then we realized the full extent of his madness. These were not minnows at all! The red and silver fish bore no resemblance to the white bodies in our jam jars. They darted about between the weeds their black and gold eyes catching and reflecting the light and simply amazing us with their beauty. They glided and flashed their way round the sides of the tank, six little show-offs sticking close together for company, and we understood how it was that Father had come to be so bewitched by them.

From that day on the disease really took hold and we all got "The Bug". The number of tanks grew until the sideboard held four small tanks and steel shelving catered for the large tanks which had appeared on the opposite wall. We got a bow-fronted tank for the hall and an ornamental wrought iron stand for the tank in the dining room. There

were even tanks in the kitchen which took the place of our defunct jam jars. The house began to fill with strange noises. The constant whirring of piston pumps and the whining of vibrators competed with the bubbling of air stones at the end of yards of rubber tubing. Every weekend, the whole family got down to the routine tasks of scraping algae off the glass with razor blades and operating plastic vacuum cleaners to suck the debris off the gravel. We talked about fish all day long and "converted" many of our friends. We went to shows and exhibitions and made weekly sorties into the country to poach daphnia with old (and sometimes new!) nylon stockings. There were fish in nearly every room in the house; ranging from neons and cardinals in the living room to guppies and platies in the nursery and leaches half-way up the stairs.

After two years of living in these cramped conditions, Mother finally put her foot down. She had much more resistance to the disease than we had and she insisted that we cut down the number of tanks to a more reasonable level. As a compromise, it was decided to move to a bigger house so that both the family and the fish would have more room.

The move to the new house about ten miles away was smoothly done and we hired a small van to transport the fish to their new quarters—a suitably large and well insulated double garage. Within a few hours catastrophe had struck! At ten o'clock in the evening of that cold November day the electricity failed! With the panic and anxiety of a mother hen protecting her chicks, Father rushed from tank to tank watching the thermometers slowly falling. Blankets were brought out and wrapped round the banks of tanks and paraffin stoves were begged from our new neighbours who were by then convinced of our eccentricity. The power cut seemed to last for days but the electricity was actually restored after a few hours. We carefully uncovered the tanks expecting the worst but to our surprise, all was well and there had been no losses. In fact, behind their blanket screen, a pair of angels had busily covered the glass with several rows of tiny clear eggs which subsequently hatched into a beautiful family of baby angels.

After that memorable night, all went well for our venture and we successfully bred a variety of both fresh water and marine species. We experienced the thrill of seeing gouramis make their strange bubble nests and we loved to watch the Egyptian mouthbreeders gather up their stray offspring in their mouths. There were the many times we sat up all night "nursing" livebearers through their labour only to find the proud fathers eating their children as soon as they appeared. (We soon learned to separate the gravid females and put them in the special breeding traps!)

This then was the environment in which my brothers and I grew up. Now that we have left home and started

families of our own. Father has had to cut down the stock to a more manageable size but he still potters around in his fish house and is constantly experimenting with the breeding of new species now that his retirement affords him more time to devote to his hobby.

Last week I was shopping in town when I noticed a display in the pet shop window. There was a crowd of people round a large ornamental tank containing a pair of Siamese fighters and I joined them to watch the fascinating display of the male as he flashed red, violet and deep purple through his trembling body as he circled his cowering mate. It was obvious that "The Bug" which had been dormant during the early years of my marriage, had really caught hold of me again.

On my desk as I write, there is proudly displayed an attractive tank containing a dozen tiger barbs which are voraciously swallowing up a cloud of daphnia. The children are watching them swoop and dart around and I am already making plans for a larger tank which will just fit into the alcove by the chimney breast. My eldest son is calculating how long it will take him to save up his pocket money to buy a pair of angels of his own.

**WARNING TO PARENTS:—**

The tropical fish "Bug" would seem to be a highly contagious condition and is especially easily transmitted from father to son. If your whole family becomes badly affected be prepared to move to a larger house. **THERE IS NO KNOWN CURE!**

## THREE SHARKS

By Jack Hems



THE GREAT FAILING of the red-tailed black shark (*Labeo bicolor*) is the animosity it displays toward members of its own kind. Whereas one red-tailed black shark in a community aquarium is not out of place, two red-tailed black sharks will almost certainly fight every time they meet, with the result that one of them—the weaker of the two—will become sadly reduced in spirits and health and soon die. But the red-finned shark (*L. erythrura*) is not nearly so pugnacious, and two or more may be kept in the same tank with every chance of a satisfactory relationship. For the sparring they frequently indulge in seldom, if ever, results in torn fins or bruised bodies.

*L. erythrura* is a more elongated or streamlined fish than *L. bicolor*. As a rule, young (small) specimens are paler coloured than adults. Adult coloration is blue-grey to grey-brown on the sides and silvery white on the belly. A black line extends from the snout, through the gold-rimmed eye, to the gill-cover. A black blotch or bar is present on the rear of the caudal peduncle. The fins, with the exception of the pectorals, are a fresh brick red. At full size the red-finned shark may measure as much as 5 in. But fish this size are exceptions rather than the rule.

*L. erythrura*, like other members of its far-flung genus—*Labeo* spp. are found in Africa as well as in tropical Asia—is a lively species, and, if it is to keep in good shape and live for upward of four years, as it will do if conditions are right, should be given plenty of food. It eats anything, that is anything eaten by an omnivorous fish. It is particularly fond of algae, and will turn over on its back or side or head to reach almost inaccessible growths on plants or fixed objects. But it is essentially a bottom-searching fish.

The aquarist is more likely to keep the red-finned shark

alive and healthy if he places it in an aquarium well furnished with plants behind which it can retire every so often. But it is not too retiring a fish and is never out of sight for long.

Top aquarium authorities do not agree on the quality of water that suits this species best. Some say it flourishes best in alkaline water; others say it should be given soft and acid water. But I can say from personal experience that any water, provided other non-faddy fishes will live in it, will do. A temperature range of about 72°F (22°C) to 78°F (26°C) should be maintained.

Aquarists who tell me that they can never keep any of the sharks (*Labeo*) for more than a month or two are usually too inexperienced in fishkeeping—tropical fishkeeping, that is—to know that the body shape at the time of purchase is of particular importance. The ventral surface of the red-finned shark is flatter than that of the red-tailed black shark, but both species should show good lines and plump sides. A hollow-chested fish that swims in a jerky or sluggish manner or with the head tilted down should be left alone. Colour is not a reliable guide to the physical condition of these fishes; for in the underplanted tank of a dealer not a few *Labeo* spp. assume subdued tints.

*L. erythrura* is found in the natural state in eastern Thailand (probably but not certainly over most of the Mekong river system), and was introduced to tropical aquarium keepers in 1956. A *Labeo* likely to be confused with *L. erythrura* is *L. frenatus*. It has red fins and black markings on the snout and tail, but is rather spindle-shaped and its general coloration is bronzy brown to light olive. It is smaller than *L. erythrura*, peaceful, and, as Professor Sterba points out, an excellent eater of algae.



# From a Naturalist's Notebook

By Eric Hardy

THE INCREASING rarity of many aquatic plants is caused largely by the destruction of their haunts. Water-germander *Ternstroemia scordium*, a sprawling grey plant with purple flowers which once had more than a score of British haunts, has so declined in recent years that the Nature Conservancy's records centre now knows only three or four places where it grows. Braunton Burrows in Devon and a disused claypit in Cambridgeshire are among the few. Once widespread along the Irish Shannon valley-lakes it is declining there from drainage schemes.

Another water-side plant nearing extinction, the fen-violet, *Viola stagnina*, is reduced to three known localities, like Woodwalton Fen, Huntingdon, though now extinct in the old peat-cuttings at Wicken Fen. Wicken Fen is still the major haunt of the marsh-pea *Lathyrus palustris*, now down to five British localities.

At Welshpool, in Border Wales, the Shropshire Union Canal Society is opposing plans for a by-pass along the line of some 1½ miles of the old canal. The Severn River Authority recently helped by lowering the level of the canal, and electrically stunning and removing fish temporarily to another section of the canal, while rubbish and unwanted weed were removed from the section in dispute.

Since barges ceased using the same canal's green, rush-strewn stretch through the eastern border of the Wirral peninsula of Cheshire, the area on either side of New Chester Road Bridge below Backford grew Wirral's richest aquatic flora. In 1935, this water got into the *Journal of Botany* when friends studied its flowering of great duckweed, *Lemna polyrrhiza*.

The Wirral stretch here harbours so many aquatic rarities that it was unfortunate that agitation against their prolific growth in 1969's hot summer resulted in a £750 operation by British Waterways using the herbicide aquacide against them. However, many of the semi-aquatics survived. Crinkle-leaved sweetflag and great clumps of arrowhead flower annually among masses of gipsywort, marsh-woundwort, hairy willowherb and wild angelica almost to Chester's Parkgate-road Bridge one way, and to Stoak the other. Perfoliate, curled and wrack-like pondweeds thrived beneath its green blanket of duckweeds. Wirral Green Belt Council is striving to have it preserved in the new Wirral Country Park approved county plan.

Among its rarer flowers I found the pink umbels of flowering rush in the fourth bay in the rushes that fringe the fields opposite the towpath beyond the railway bridge; and in the opposite direction, under the second shrubbery before the pipe-bridge. Water-stitchwort (not to be confused with common bog-stitchwort), which grows in 4 sites in the nearby Gosy Valley, favours a deep, shaded ditch between Backford and Croughton. Frogbit, floating water-plantain, *Alisma natans*, and great seailcap border the bank near Caughall Bridge. Tripartite bur-marigold lifts up its head among the water forget-me-nots, while great pond-sedge droops its flowers above them.

Incidentally, floating water-plantain was located recently in a dyke near the sandpit pool on the north side of Lancashire's Martin Mere, at the end of Tabby Nook off the

Mere Brow road from Southport. This site isn't in the recent *Flora of South Lancashire*, nor is the location on the other side of this mossland, at Rufford. The rare *Alisma lanceolatum*, found in the same dyke, is peculiarly widespread in the mossland dykes just inland of Southport.

I have mentioned before the misleading maps recently published in connection with the Nature Conservancy's distribution survey of British fishes. Even though these are intended to be preliminary maps, they confuse and mislead young people, and beginners, who only glance at them and have no background information on the real position in some areas. For example, the new 2nd edition of the Council for Nature's 20-page *Advice for Young Naturalists* has a 10-km. grid-square map entitled: "The Distribution of the Three-spined Stickleback in the British Isles" which shows no breeding areas in south Lancashire beyond three along the eastern boundary, only one in the Wirral peninsula of Cheshire and none in Flintshire, all areas which should be plastered with as many dots as are West Riding, Lincs and East Anglia. It is really a map of the distribution of recorders, a fact hidden away in the text of another page, which should be in the caption.

At a Council for Nature meeting I recently attended at the Zoological Society's rooms in London, Dr. F. H. Perring, director of the Nature Conservancy's biological records centre, showed us a map produced in 1963 of the common frog in Britain which he rightly called a "nonsense map" as it mapped the distribution of frog-spotters, not frogs. Dots crowded the well-reported ponds around London and Manchester, but blanks marked most of Lancashire and Cheshire, Western Ireland and mid-Wales, giving entirely false impressions of the position. Was this the reason for Vesey Fitzgerald's 1968 book *World of Reptiles* misleadingly doubting if the frog survives at all in Lancashire?

Equally necessary is the recording of all introductions of aquatic animals and plants. Many of us are interested in the Swedish attempt to replace stocks of native river crayfish, decimated in Sweden by a virulent fungus disease, with the larger American signal crayfish, imported from Lake Tahoe in Nevada and California. It proved easily transplantable, resists the disease, but its more aggressive rapidly reproducing nature may exterminate the native European crayfish. Commercial crayfish-marketing is already interested in the introduction. High prices are paid in Sweden and Denmark for these crustaceans, which have to be imported from Turkey and Bulgaria to meet the trade. Meanwhile Russians have saved native crayfish from extinction in Lithuania by stripping females of fertilized eggs and hatching them. Last spring, the 6-10-day-old larvae were released in ponds whose water-temperature ranged between 10 and 15 deg. Centigrade. Half-a-million young crayfish were thus introduced into rivers and lakes there in 1969. The work was at hatcheries in eastern Lithuania. The Russians elsewhere have transplanted various crayfish species inhabiting the Azov-Caspian Sea basin. Up to 90 young were hatched from each female in their Lithuanian hatchery.

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# Herpetological Notes

By Stephanie J. Peaker, B.Sc

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## NATRIX

THREE SPECIES of snake in the genus *Natrix* occur in Europe. All are suitable for housing in the outdoor reptiliary and require similar treatment. The Grass Snake (*Natrix natrix*) is often the first snake kept by the herpetologist and this species is found over large areas of Europe. A number of sub-species exist and the range of the whole species is from Asia Minor in the East to the Atlantic and from Scandinavia in the North to Algeria and Morocco in the South.

The Dice Snake (*Natrix tessellata*) is found in Central and Southern Europe and reaches east across Asia to western China. It tends to be more aquatic than the other two species.

The smallest European member of the genus is *Natrix maura*, the Viperine snake, so called because of its supposed resemblance to the viper. This snake is found in south-western Europe, mainly Spain and Portugal and also occurs across the Straits of Gibraltar in North Africa.

All three species live near water and eat frogs, newts, tadpoles and fish. In fact the fondness of this genus for water is the reason why these species are called water snakes by the Americans. In the indoor vivarium, this does not mean to say that they require wet living conditions. Whilst large water containers may be provided, the ground must not be allowed to become wet or skin diseases will soon develop. The humidity of the air should be low enough for the snake to dry off quickly so adequate ventilation of the vivarium is needed. However, this problem does not arise with an open, outdoor reptiliary.

Feeding these snakes may present some problems. Frogs in England are in short supply and fish may be substituted. I have found that goldfish runts can sometimes be obtained cheaply and tadpoles in large numbers make a good diet for younger specimens. The Viperine snake may sometimes accept earthworms.

It will sometimes be seen that the scientific name of the genus is given as *Tropidonotus*, a name used by Schreiber in 1913. The nomenclature has now reverted to that of Linnaeus so that the genus is again and we hope finally called *Natrix*.

## PYTHONS

There are a number of records that while brooding, the female Indian Python (*Python molurus*) can maintain a body temperature higher than that of its surroundings and thus incubate its eggs in a manner similar to that employed by birds. The first report of this phenomenon was made by Lamarre-Picquot in a communication to the French Academy in 1832. However, this observation was not accepted and a committee of the Academy concluded that

Lamarre-Picquot's conclusions were hazardous and questionable. Other workers, notably F. G. Benedict, supported the original observations but only in the last few years has conclusive evidence been obtained that the brooding female Rock Python does in fact incubate its numerous eggs.

Observations in the New York Zoo in 1960, 1961 and in 1965 by Drs. Hutchinson, Vinegar and Dowling using modern methods of recording temperature have been made on the Rock Python. If the surrounding temperature fell below 33°C (91.5°F), spasmodic contractions of the muscles along the length of the body took place which raised the body temperature above that of the surroundings and this process has been likened to shivering in mammals.

In the python studied, the greatest difference between the surroundings and body temperature was 4.7°C (8.5°F) and this was recorded at 24.8°C (77°F). Below this temperature the mother could not maintain a difference.

Incubation by other species of python has been recorded at the New York Zoo by the same zoologists and body contractions have been observed in a brooding New Guinean Green Python (*Chondropython viridis*), a finding reported in a German journal.

## YOUNG TERRAPINS

Last year in these notes, attention was drawn to the possibility of *Salmonella* infections from baby American terrapins. An extract from a letter published in the *British Journal of Herpetology* (4, p. 64, December 1968) throws further light on this topic. It appears that the baby terrapins are produced by "turtle farms" which are situated mainly in Louisiana. The adults are housed in enclosures which include a shallow pond and are fed with offal from poultry or other animals. Eggs are laid in the soft soil and these are removed and artificially incubated. The babies are kept for a few weeks until ready for shipment to pet shops all over the world.

The United States public health service found that a large number of these farm ponds were infested with *Salmonella*, the organism responsible for food poisoning.

I had not realised that these unfortunate young terrapins were in fact bred commercially and I now think that their generally poor condition is not wholly the fault of the importers in this country since these reptiles have a very poor start in life. The same letter states that in Louisiana ten million baby terrapins are sold each year for retail sale in the United States and elsewhere. The losses within the first six months are probably so great that apart from a few thousand or perhaps even a few hundred, almost ten million terrapins are killed by this trade every year.

# OUR EXPERTS' ANSWERS TO YOUR QUERIES

## COLDWATER QUERIES

By A. Boarder

Please enclose a stamped addressed envelope when writing to our experts or to the Editor for advice on your problems



I have a pond in my garden and last year had many eggs from which I hatched a number of fry. However I lost them all when about ten months old. I now have some more and would like to rear them. Where did I go wrong?

It is probable that the fry did not have enough space in which to develop or that the water became foul through the fry becoming over-crowded. At ten months of age fish would require a 24 x 12 x 12 in. tank for each twelve fish.

Could you please give me some advice on white spot, how to cure it and how to prevent it?

If you understand the metamorphosis of the pest you will be able to deal with it better. The parasite gets under the skin of a fish. This must be introduced into the tank or pond from outside. I know that many aquarists say that white spot is caused by a chill, but this is not so. A chill could, of course, lower the resistance of the fish but unless the parasites were in the tank, either as cysts, young ones, or mature pests, then all the chilling possible could not give the fish white spot disease. Prevention then means that no dangerous outside matter, either alive or dead is brought into your tank or pond. Only use live food which has not been bred or which lived in water and no water snails or plants must be brought in from the wild. Any fresh plants or fish must be well quarantined before being placed in with other fish.

Several cures are possible but I consider that the easiest one is to remove the fish from the infected tank or pond. Sterilise this and then move the fish from one tank to a sterilised one each day. Try to warm the water to 65°-70°F, as this hastens the development of the parasites. When the mature pests drop from the fish to encyst on the bottom they will be washed away before they have a chance of hatching out into many new parasites.

My fish in an outdoor pond are being attacked by a parasite which I have been told is a hook worm. How can I get rid of it?

The pest is known as an Anchor worm (*Lernaeae*), and is very difficult to eradicate from a pond. This pest which is a copepod not a true worm, attaches itself to a fish and feeds on it. Your sketch is a good one of the parasite. This is the female, as the male is very small and mostly free-swimming. You must catch the fish and remove the pests

with tweezers after having touched them with neat T.C.P. There seems a lot of this pest about nowadays, as I have had two letters in one morning describing the parasite from as far apart as Grays, Essex, and Ipswich in Suffolk.

Apart from emptying and drying out the pond I do not see how you can rid the pond of the pests.

I have constructed a concrete pond by using what is stated to be a correct mixture of sand and cement and have also used Pudlo waterproofing. The thickness of base is 5 in., and the sides 4 in. On top of this I put a coating of 3-1 concrete to a thickness of half an inch. Now the pond loses nine inches of water in a day. Where did I go wrong and what can I do now?

There must have been a fault in the construction for the pond to lose water at this rate. Either the cement was old or the sand was dirty or too soft. Very sharp, clean sand is necessary and the cement must be fresh and live. Also when constructing it is essential to work with as much speed as possible as cement soon starts to go off when wetted and fresh applications will not adhere to old, once they have gone off. This leaves a weak spot. I have small concrete boxes not more than half an inch thick which hold water perfectly and these were only made with one part ordinary cement to three parts sharp clean sand.

It is often the case that fish in a garden pond cannot be seen during the summer because of the green water. I am considering the construction of a new pond and wonder if it will be possible to incorporate a filter at the same time to try to obviate the cloudy water?

When you excavate for your pond, pile up the soil at one side and construct a rockery there. Whilst doing so make a water-fall with a small series of pools. In one or more of these pools you can have sharp sand and broken charcoal, or even other forms of filter. Then as the water is pumped up to the top of the fall it can be gently filtered as it flows through the pools.

I have an old bungalow bath which I wish to make into a pool. I have painted the outside with bituminous paint and wonder if I should also paint the inside? How many plants and fish can I keep in this pool?

There should be no need to paint the inside of the bath, but the same as was used on the outside would do no harm after a wash out. You should treat the bath as a tank and not a pool and only put in a few water plants. These soon grow and could cover the whole area in a short space of time. A dozen three inch goldfish would do well. Do not try to keep too many as a few would thrive much better than too many.

I had a bad attack of fish lice on my goldfish and got rid of them as I thought. Now after a week or two there are more of them. Why do you think this is?

Fish lice (*Argulus*), leave their host to lay their eggs. These are laid on stones, sides of ponds or water plants. It is probable that even when you had cleared your fish of lice there were still some eggs left on matter in the water. You may find that another search and clearance of the fish will solve the problem. A pond would have to remain quite dry for about a week to kill off any pests or their eggs.

Can anyone give me any information as to the possibility of constructing a pond with plastic sheeting?

There was an article in *The Aquarist* a few months ago. It is advisable to use a type such as Butyl lining as this is long lasting. Get the book, "Garden Ponds" published by Foyles at 5/- as this describes the up-to-date methods of pond construction and maintenance.

I have a Gro-lux tube for lighting my coldwater tank. When I switch it on the fish always scurry out of sight behind the plants and stay there until the light is switched off. The tank is near a glass screen. Why do they so react?

It may be the type of light and it may be the glass screen which is casting a reflection which the fish do not like. Make two experiments, cover the screen and see if this makes any difference and if not, try an ordinary filament lamp and see if the fish act the same. If they do try giving a little of their favourite food soon after switching on the light. This may bring them out.

I have made a plastolene lined pond in the garden and introduced goldfish. I am now losing one a week, they just lie listlessly before dying. Why is this?

It sounds as if the water is impure. This may be from the sheeting which was not washed before the pond was filled. It may be that the water is not pure. If it had come from fairly new copper pipes this could be poisonous. If the fish were healthy when purchased there is no reason why they should die if the water was pure. Of course if you have been over-feeding, the uneaten food could soon pollute the water. Try changing most of the water and then go easy with the food for a time.

Could a coldwater tank be used with only artificial plants in it?

Live water plants are the natural accompaniment for fish. Not only that but they perform necessary work to the great advantage of the fish. In the first place when there is light, they give off oxygen to help keep the water safe. Their roots work among the mulm at the bottom of the tank and use up much of the waste matter from the fishes. I consider that plastic plants and ornaments are quite out of place in a properly set-up tank. A living picture can be created by using growing water plants with the right number of fishes.

I wonder if you can suggest why we lost our golden orfe. We had six about two inches long two years ago and they grew to about six inches long. Soon after the hot weather started this year they all died with their mouths wide open but showing no signs of injury or disease?

There is no doubt why the orfe died. The hot weather drove out much of the oxygen in the water and any decaying matter in the pond added to the trouble as this gives off foul gases, especially when the water warms up. I have stated so many times that golden orfe are an excellent fish for the garden pond as long as it is kept well oxygenated or fairly large. A water-fall or fountain would assist to keep the fish healthy during hot spells. The larger the fish the sooner are they in trouble when the water loses some of its oxygen. Some fishes such as carp and tench can withstand a certain amount of lack of oxygen, but orfe, never.

I have been treating a veiltail for fungus disease with table salt and think I have effected a cure. However now the fish has developed one or two black spots on the body. What is this and the cure?

The black spots will probably disappear soon; it is no doubt where there has been some damage from the fungus that fresh flesh or skin is growing. In many types of goldfish the new growth may be black at first but soon dies out.

I have carp which has lost its colour and is almost silver all over. Why is this?

Some fishes lose their proper colour when they are placed in a tank or pond where there is a light colour to the base. Once a pond or tank greens up the fish usually return to normal. Many aquarists who exhibit coarse fishes are disturbed when a grand coloured fish is put in a show tank, to find that within minutes the fish has lost its colour and turned pale. The colour returns usually when the fishes are returned to their pond.

## TROPICAL QUERIES

By Jack Hems

I am rather worried by a greyish sponge-like growth in one of the lower corners of my tropical aquarium. The water is clear and slightly acid, the plants are healthy, and the fishes show no signs of disease. I have not removed the growth from the aquarium, but would certainly like to know what it is.

Your description fits that of a sponge. A few species of sponge occur in freshwater and sometimes find their way

into a tropical aquarium. They form an encrusting growth on fixed objects and draw the tiniest particles of food into their bodies through small pores. They do no harm to fish or fry. They will only stay alive in a well-tended and well-aerated aquarium.

Is it really true that the archer fish (*Toxotes jaculator*) can spit a drop of water several feet?

Years ago I kept five archer fish in a tank standing about six feet from my writing table. The glass cover did not fit very closely and it was a common occurrence to be hit by

Continued on page 270

## TROPICAL QUERIES

continued from page 269

drops of water ejected by the fish as I sat at my typewriter or turned the pages of a book.

**If a keeper in a zoo handled an electric eel would the discharge of electric current kill him?**

We have never heard of such a shocking death, but there is no question that this fish can produce an electric charge of up to about 300 volts at 100 watts. This is said to be sufficiently strong to throw a male off its feet.

**I have succeeded in obtaining some of the uncommon Java moss (*Vesicularia dubyana*). Would this beautiful moss stay alive in an unheated tank kept in a warm room?**

If the temperature of the tank does not sink below about 65°F (18°C) all should be well. But a temperature below this will turn the moss a sickly yellow and kill it.

**The proprietor of a local pet shop sold me a pretty little plant called helxine, which he said would grow in my aquarium. But after a few days underwater the plant turned white and died. Do you think a temperature in the upper seventies (°F) killed it?**

Far too many house- or window-plants are being recommended for the aquarium by dealers who should know better. *Helxine soleirolii*, or baby's tears, in all its several colour forms, will not grow submerged. Its proper place is in a pot of peaty loam stood in a dish of water placed on a window ledge, or in a damp vivarium. It can stand a fair amount of heat, provided the air is not dry.

**I have just acquired five small *Barbus oligolepis* and would like to know how to tell the sexes apart, and whether I could breed a pair in an 18 in. by 12 in. by 12 in. aquarium?**

Unless your barbs are very small (immature), the male of the species should be easy to distinguish from the female; for his dorsal and anal fins have black edges and his colours are brighter even out of breeding condition. You could breed this species in an 18 in. by 12 in. by 12 in. tank, but this barb is not what aquarists call a ready-breeder.

**I have seen some prettily coloured fish in a dealer's shop. The dealer says they are glass barbs, but I cannot find any fish bearing this common name in my books. Please could you tell me the scientific name, the country of origin, and the general disposition and requirements of this fish in captivity?**

The glass barb is correctly known as *Oxygaster oxygastroides*. It is native to Thailand and the Great Sunda Islands. It is not aggressive, but as it may exceed a length of 4 in. in the aquarium it is best kept with fishes of about its own size. The usual tropical aquarium conditions suit it very well.

**Soon after I feed dried food to my neon tetras some of them assume a head-downwards position and swim jerkily for an hour or two, after which they regain normal. Can you explain this?**

This peculiarity occurs among lots of fishes after eating dried food. Seemingly it is brought about by the food swelling after contact with water and upsetting the normal functioning of the air-bladder. The way around this problem is to wet the dried food before feeding it to the fish in your aquarium.

**Could I introduce a liquid plant food into an aquarium without running the risk of harming the fishes immediately or at a later date?**

Provided you understand sufficient about the formula printed on the bottle, you may improve the growth of certain aquarium plants by adding a few drops of certain proprietary plant foods without endangering the health or lives of your aquarium pets.

**I would appreciate some information about a fish called *Abramites microcephalus*.**

This anostomid is well known for its habit of moving about with its well-fleshed body tilted head-downwards. It is peaceful, but large specimens of some 5 in. and more are better kept with equally well-built companions. *A. microcephalus* flourishes best in a shady, peat-bottomed aquarium maintained at a temperature of about 75°F (24°C). Live *Daphnia*, tiny worms of all kinds, and gnat larvae are appreciated as food. *A. microcephalus* should be given plenty of space to allow for proper growth and exercise.

**Next week we are moving house and I would like to know the best way to carry my thirty small tropicals to our new home. But a car journey of about 200 miles lies before us. A tank will be got ready for the fish a day before, but it is the long journey that is worrying me.**

Obtain two large polythene bags (one to slip over the other as a precautionary measure against leakage) and half-fill a bag with water siphoned out of the aquarium. Place the fish in this. Now secure the bags and place them in a cardboard carton. Next, fill in round the sides with warm sawdust, or warmed newspaper to retard heat loss. If you carry out these instructions, your fish should come through the journey perfectly well.

**My fish are gasping at the surface and I cannot think what is wrong. The water is clear, I have not introduced too much dried food, and the plants appear to be healthy. Yet the piece of stone I put in from my garden the other day is covered with tiny bubbles. Please can you help me?**

Remove the stone without delay, siphon away most of the water and fill up with fresh at the same temperature. It is asking for trouble to introduce any stone or shell or ceramic ornament unless you can be certain it is not going to harm the fishes in your tank. Freshwater tropicals are sensitive to lime dissolved out of some stones, shells, and the like. Again, stones picked up in a garden or allotment are sometimes impregnated with chemical sprays and the wrong sort of fertilisers (for an aquarium).

## Fish in the News:

# THE AFRICAN LUNGFISH

By F. L. Vanderplank, B.Sc., Ph.D.

SOME 30 YEARS AGO when I first went out to Tropical Africa, the African Lungfish, *Protopterus aethiopicus* was thought to be comparatively rare, but as our knowledge advanced the African lungfish was proved to be extremely common all over tropical Africa, particularly in Uganda, Kenya, Tanganyika, Zambia and neighbouring Territories. It is common in Lake Victoria, although this vast Lake never dries up like the rest of the water in these territories.

The lungfish looks like an eel but has important differences; in place of pectoral and ventral fins it has processes half-way between fins and legs and uses these to help it move over wet mud. The main zoological feature about the lungfish is, of course, the presence of primitive lungs which enable the fish to breathe air. When this was first discovered in the American lungfish it was something new in fish, but now we know there are quite a lot of different species of tropical fish with various developments towards breathing air, and some tropical groups live with their heads nearly always out of the water. As most of tropical Africa completely dries up for 6 to 9 months of the year, tropical fish in these areas have developed various means of ensuring their survival over this period.

The lungfish is a primitive fish and has been in existence for 400 millions of years. Its method of survival for periods of drought up to 2 or even 3 years is very interesting and has recently been partly investigated by American Scientists. The African, and for that matter the American and the Australian, lungfish burrow into the mud as the water dries up and makes a chamber in the mud where they become inactive like hibernating animals in colder regions. Of course, in the Tropics temperatures remain 25-28°C and at times the mud gets very much hotter. Since fish are cold-blooded they still take up the prevailing temperatures of their surroundings, but oxygen consumption drops by 80 per cent and they become torpid. American scientists have now extracted a hormone from the brains of African lungfish which, when injected into rats, cause their body temperatures to drop and for them to become torpid and refuse to eat. The substance is said to be a low molecular weight polypeptide. Another rather more interesting feature about the African lungfish is the way it makes its mud home. If it just burrowed and waited for the mud to dry up, the odds are that the mud would crack right through the fish's chamber, in Africa the cracks in the dried mud get 3, 4, or more inches wide and many feet deep before the end of the dry season and this would expose the fish to predatory birds and animals. First of all the lungfish, like the larvae of various horseflies (or Tabanids) which do the same thing, burrows all round, in a spiral, the intended chamber and underneath it, then enters from the centre of the top and lines the chamber with mucous; it probably also coats the outside burrows with slime or mucous as well so as the drought proceeds the chamber holds together as a unit and can be lifted out of the rest of the mud with fish inside (and unable to get out). This treated mud goes very hard and needs a hammer and chisel to open it up but

is most easily opened by placing it in water where it will break up within 24 hours. There are several species of African lungfish, those from the Central regions of Tanganyika (or Tanzania) do not get so gigantic as the Australian species or the Congo one. They are, however, quite big, growing generally to about 2 feet in length. After mating and building a hollow "nest" in the shallow muddy water, the male guards the eggs and the tadpole-like young when they hatch. The young lungfish look like tadpoles because they have external gills like most young tadpoles of frogs and toads and, like these creatures, lose their gills as they develop internal lungs. In the case of the lungfish its lungs are a development of its air bladder, which all bony fish have. The hormone mentioned earlier could be of benefit to humans, but it is reported that it will be too expensive to carry out further investigations at present; no doubt if there are any useful possibilities pharmaceutical companies will not be slow to find the money and investigate.

Lungfish take 2 or 3 years to become full grown in the Tropics so would take quite a lot longer in a large tropical aquaria in this country. They make good intelligent pets and eat a variety of foods including chopped liver, heart and other types of meat. Even small lungfish can give quite a bite while large ones like large eels inflict very nasty bites so one has to be careful of one's fingers. Lungfish can be transported in their hardened mud chambers but due to the weight of the mud this is rather an expensive way of importing them.

### Cures Review

"TROPICURE" cures, for tropical and coldwater fish, are manufactured by Tropicure Products, Scotland Lane, Horsforth, Leeds. Each cure is a liquid, supplied in a small bottle, price 5s. 0d.

There are ten different treatments available in this range of remedies. Unfortunately none of the bottles states the quantity of substance contained, nor do the labels state what the constituents are, and one can only guess as to what they contain. The range includes the following treatments: "White Spot Cure", and a special "Dealers' White Spot Cure"; "Fungus Cure", "Fish Tonic"—for keeping fish free from known diseases; "De-Chlorinator"—for removing chlorine from tap water; "Cloud Off"—for the prevention of cloudy water; "Methylene Blue"; "Velvet Cure"; "Sterilize"—the spelling of which differs on the price list—and which can be used for treating fish, plants, equipment, and for the cleaning of tubifex; and "Plant Fertilizer"—a pale, yellow liquid, added to the aquarium water each month, to keep plants in good condition. B.W.

### APOLOGY

WE REGRET that in the November issue a review for Trophy Products gave the address of the company as Orchard Cottage, Bristol. The correct address is Huckford Lane, Kendleshire, Bristol, BS 17 1AP.

## OUR READERS WRITE



### AIRLIFT FILTER AND THERMOSTATS

Whilst it is encouraging to see the younger generation taking an active interest in the hobby, I hope that Stuart Smith, whose article on a "Home Made Airlift Filter" appeared in the October issue, will not be deterred from further efforts if I add a note of warning to those who may put into practice his idea.

He says in his article "... water is returned to the tank along more aeration tubing." I hope he is aware of what will happen should the filter medium become clogged, or the return tubing, for that matter; his efficient looking air lift is continuously supplying water to the filter box, and as the inlet of the airlift tube is quite low down in the tank for optimum mulm pick up, an awful lot of water could be pumped into, and out of, the filter box before it was noticed.

It would be safer to siphon the water into the filter and pump the clean water back to the tank; now if the filter becomes clogged, the water can only rise to the level of the water in the tank and will not overflow.

On the subject of the "Heater and Thermostat" letter by C. R. Outtrim, whilst sympathising with anyone who loses a tankful of fish, I feel that it needn't have happened in the first place, and shouldn't be blamed on a combined heater/stat in the second.

Any 'stat can jam "ON", whether it be separate or not, and the result will be the same. What is more likely is that too large a heater was used for the tank size, hence a "boil up" in a short time; this fact also contributes to a 'stat failure, as the larger current drawn by a large heater causes "pitting" of the 'stat contacts and could cause them to weld together. Over a period of time, a large heater necessitates more "on-off" movements at short intervals, which also shortens the life of the 'stat.

Obviously, when one presses into service a small tank for a sick fish, or for breeding, one tends to grab any old heater and 'stat and nine times out of 10 we get away with it, but for long-term heating, give a little thought beforehand,

and select the right heater size/tank combination.

A simple safeguarding circuit can be made up, if your prize collection is thought worth it, and consists of three thermostats, heater(s) and a neon lamp. Reference to the diagram will clarify. The thermostats are set to various temperatures and operate in the following manner:—

**A=Heater(s). B=Thermostats. C=Neon Lamp.**

**Thermostat (2) is set at 75°F, or "normal".**

**Thermostat (1) is set at 85°F, or "normal" +10°F.**

**Thermostat (3) is set at 65°F, or "normal" -10°F.**

Under normal circumstances (1) remains shut.

If the temperature falls and (2) the master 'stat fails and stays open, then (3) turns the heater on at 65°F; neon lights between 75° and 65° only.

If the temperature rises, and (2) stays shut, then (1) operates and switches off the heater at 85°F and the neon lamp lights; in this condition the tank will automatically be kept at 85°F.

If (1) remains open, (2) cannot operate, temperature will drop and (3) will operate at 65°F; neon lamp lights.

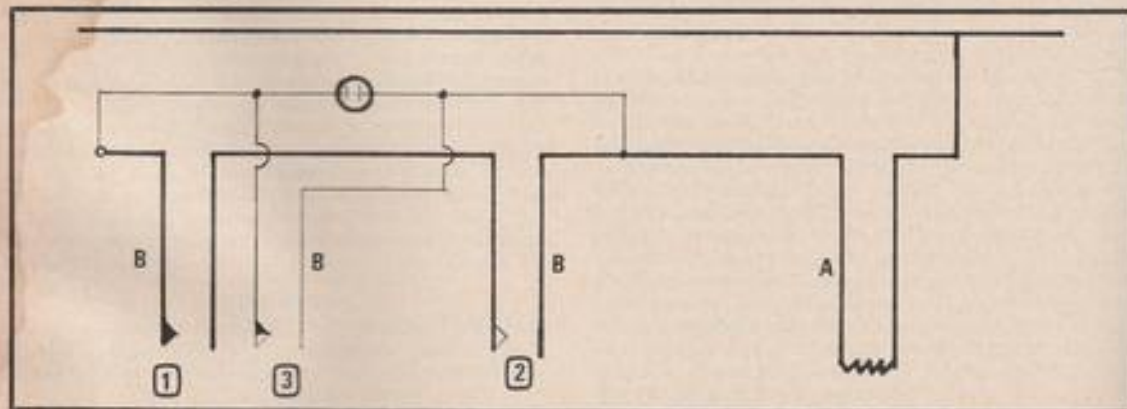
The neon only operates when the safety system is working, either indicating overheating and master 'stat (2) stuck shut, or cooling and failure of safety 'stat (1).

Permanent lighting of the neon indicates (1) and (3) stuck open and a cold tank!

Intermittent lighting indicates safety system in operation and with temperature at 85°F indicates master stuck shut, and with temperature at 65°F indicates master stuck open or (1) stuck open.

Readers will be quick to notice the Achilles' Heel in the system, it fails completely if the main electricity is cut off, however you'll be bound to notice that, as the TV will go off too!

R. C. MILLS,  
Perivale,  
Middlesex.



### Our Critics Criticised

Reading the article "Our Critics Reply" (*Aquarist*, Oct., 69) I was deeply disappointed by the opinion your critic, Mr. J. B. Clark, expressed concerning the article (The state of the marine hobby) by Mr. G. F. Cox in the August issue of *The Aquarist*.

It appears that it is criticism for criticism's sake, and as such it hardly deserves the space in your magazine. I have read the said article and found it excellent, especially from the point of view that Mr. Cox very sensibly indicates those products which give the best results. I believe that by naming some of these products Mr. Cox did a considerable service to us, the readers and hobbyists.

Let's face it, the market is flooded with useless and expensive equipment; it is only by trial and error that one discovers the truly useful product, unless someone with previous experience allows us to benefit by it.

Surely if someone is prepared to experiment (at no mean cost) and to avail others of the fruits of these experiments, it hardly behoves anyone to thwart him in his efforts to spread the gospel and gain followers for the marine hobby.

I especially abhor that mildly slanderous implication where Mr. Clark writes: "Superficially the article reads as an unprejudiced opinion, akin to a survey, by mention of several manufacturers and their products which have apparently received free publicity."

In my dealings with SeaAquarium I have found them honest, helpful and very fair! I am convinced that due to their unbiased recommendations, my initiation into marine fishkeeping went without loss or trouble. Over the years I have bought from many dealers, and in my opinion many of them should aim to be as fair and unbiased as Mr. Cox, who would rather lose hard cash in his anxiety to advise the amateur.

Finally, Mr. Clark ends his so-called criticism with a lot of flattering words. It makes it worse, rather like wrapping up the contents of the dustbin in a Christmas wrapper.

Let's have some constructive criticism, please!

A. MESZAROS,  
High Wycombe,  
Bucks.

### Breeding Angels

I was very interested in the article written by Mr. J. B. Elgin concerning "Angel Queries" and published in the October edition of *The Aquarist*.

I, like the writer, have had considerable enjoyment after much disappointment while attempting to raise batches of young Angel fish. I had two excellent pairs of adult fish which produced eggs at regular intervals of ten days. Having given up hope of ever rearing the youngsters in the presence of the parents, I resorted to various artificial methods as recommended in the literature.

I first tried raising the youngsters in a clean tank containing gravel and undergravel filters, and after a number of failures I began to notice that as soon as the young became free-swimming they started to burrow their way down into the gravel and being unable to free themselves they died and most of them must have decomposed, unseen.

I next tried hatching the eggs in small plastic containers with adequate artificial aeration, and transferring the young fry, after they had reached the free-swimming age, to a completely bare tank with artificial aeration. Using this method I have successfully reared and sold several dozen

youngsters together with their parents, and am at present waiting to see if the youngsters which I retained, having grown to adult size, will continue the cycle for another generation.

M. G. FARRINGTON,  
Pelsall, Staffs.

### Snails

I have read many different views on the keeping of these in an aquarium and would like to express a comment.

I prefer the Keeled Ramshorn (*Planorbis carinatus*); two of these in a lighted tank with the usual plants, etc., do a grand job of clearing up any algae which seems to appear in most tanks; also they help to clear up any food which may have been left.

If you have a microscope you can place the eggs and capsule on a slide and observe the growth of the embryo, you will see the embryo turning and the heart beating, etc., and watch the shape and mantle forming; you will find that most fish will eat up the small snails, failing this they can be crushed between finger and thumb and fed to the fish.

I would like to point out that the brown shell and blood red foot shows up very well in a lighted tank.

I have heard a lot about snails and diseases but the only time I found disease amongst them was when I obtained some other snails from an aquarist who should have known better.

I found when I examined the faeces under the microscope that there was an encystment in the faeces and this in turn infected the fish with fatal results; but I must point out that this was a rare case, and like everything else the usual care must be taken to ensure the right environment which will enable the aquarist to enjoy these wonderful animals.

P. A. SMITH.

### Inter-Society Hook-Up Required

The Aquarist Society of Victoria of which I am advertising promoter would like very much to hear from some of the societies in Britain and other countries who subscribe to *The Aquarist* either by individual letter or their own club magazine. In return we would be very pleased and happy to reciprocate.

On behalf of the above society I would be grateful if this request could be included in News from Aquarist Societies in some future edition of your magazine.

P. E. GILBERT,  
57 Howe St.,  
Victoria, B.C.,  
Canada.

### "Clinician" or "Naturalist"?

I refer to the article in your August issue on the "Current State of the Marine Hobby" by Mr. Graham Cox of Seaquarium Ltd., who is a good friend of mine, where he refers to my methods as being clinical. I presume this is because I use ozone and "reactors" to keep the water from fouling with heavy protein feeds and the desire to keep natural algae and nut covered Rochecork in my fish tanks.

I also keep an invertebrate tank where no filtration is used (to encourage micro life) and the water is agitated solely by air stones.

Do I qualify to be "clinician" and "natural system" for the two types of work?

A Reader,  
Knaresborough.



Scientific Investigation into

# How sea-dwelling Mammals can communicate and find food under water

By Michael Lorant

Dr. Poulter with sea mammals



DR. POULTER, senior scientist and former associate director of Stanford Research Institute in California, was for a number of years responsible for the Institute's physical science research. As a young man, he was Second-in-Command of Commander Byrd's famous Antarctic Expedition, leading the team which saved Byrd from carbon monoxide poisoning. Dr. Poulter is currently engaged in a far-reaching investigation into the special abilities of sea-dwelling mammals—how they communicate and find food under water.

The result of his research led to the establishment of Stanford Research Institute's "Biological Sonar Laboratory" with its unique Anechoic Tank in which he conducts his experimental investigations using Californian sea-lions and penguins.

Seals and penguins can both locate fish in total darkness, the question became one of determining how. There are several ways it might have been done. The fish might have made a sound or the seals or penguins could have used sonar—an echo-ranging technique. If sonar, then

Picture shows the Anechoic Tank in which Whiskers' ability to locate food was tested. Baffling prevents echoes



there is also the question of how the animals generate the sound source. Examination of magnetic tape recordings made during the feeding tests showed that for both the penguin and fur seal, the best signal source was "water cavitation clicks."

Water cavitation is produced by any object moving through the water. Essentially, what happens is that centrifugal forces created by the movement produce cavities. These are not bubbles in the usual sense, since bubbles are filled with gas. The cavities are empty; they are simply holes in the water. The cavitation clicks are produced when cavities no larger than few millimeters in diameter collapse. The cavities last for only a few milliseconds and hence are invisible to the naked eye.

Studies of penguins and fur seals were followed with studies of California sea-lions, which not only use an effective sonar for locating pieces of fish but can also discriminate between meat and fish in total darkness. The subject of the tests was a male named "Whiskers," who had been captured at the age of two years and kept at the Biological Sonar Laboratory for about four months. When Whiskers was placed in the anechoic tank with the lights off for the first experimental feeding period, monitoring did not reveal any large amount of clicking and only an occasional piece of fish would be picked up before it drifted to the bottom and became inaccessible in the acoustical wedges. When the lights were on he would retrieve the fish quickly with the emission of very few audible clicks. For two weeks Whiskers was fed primarily in total darkness, with the fish being lowered into the tank by a piece of silk fish line threaded through the tail of the fish with a knot in the end of the line so that it could be pulled through easily. This line was then held by hand so that the operator could detect any contact and know when the fish was taken. By the end of the

second feeding period, Whiskers was clicking most of the time and retrieving the fish after a delay of only a few seconds. During this period, the characteristics of Whiskers' clicking signals were studied by listening to the monitoring loudspeaker, and through sonagrams and other analysis techniques.

Whiskers adapted readily to the training and testing, and even seemed to find it enjoyable. After he had eaten as many fish as he could he would continue to retrieve them, and drop them on the bottom of the tank, like a dog chasing a ball. A careful examination of Whiskers' clicks showed certain characteristics that had not been observed for any other California sea-lions previously studied. For example, Whiskers' clicking signals were related to the type of target on which he was echo ranging. This was first observed while experimenting with fish of different sizes. When a very small fish was suspended in the water in total darkness, the monitored clicking appeared to have two distinct frequencies. When no fish were being introduced into the tank, which was still in total darkness, Whiskers produced much louder clicks and at a more nearly uniform rate. The series of clicks would always terminate just before or at the same time Whiskers reached the fish.

Some investigators have suggested that the sea-lion searches around in the tank at random until it runs into the fish. Therefore, in order to determine the exact path of approach, four hydrophones were mounted in the research tank—two near the surface in two opposite corners of the tank and two near the bottom in the other two corners of the tank. To determine the exact path taken by the sea-lion as it approached the fish, the animal's clicks were then recorded on four channels of magnetic tape from which triangulation measurements were made. In all paths thus plotted, the path of approach was very nearly direct, both horizontally and vertically. In no case did the animal dive deeply and approach the fish

While sea-lions are friendly with man, they maintain a rigid hierarchy in groups



December, 1969

from below, as had been shown for visual approaches, particularly in dim light.

After two weeks of training, Whiskers was retrieving the fish on 100 per cent of the runs even though they were in a corner of the tank or so close to the acoustical wedges on the walls or bottom of the tank that they would be outside of any random swimming pattern.

The studies with Whiskers showed for the first time that the underwater sounds of the California sea-lion are directed in a broad beam and generally forward. A direct relation in cause and effect between the signal emitted by the sea-lion and the target presented to it was shown, confirming its use of an active sonar. And it was shown that the discrimination ability of the California sea-lion is nothing short of phenomenal.

## BOOK REVIEWS

"AQUARIA" by Jim Kelly. Published by Brockhampton Press at 12s. 6d.

Included in the popular "Illustrated Teach-Yourself" series, this book follows the excellent pattern common to that series. A methodical layout takes the reader step-by-step through the complete beginner's gamut from assembling all the necessary impediments to curing diseases. As well as being liberally illustrated with coloured photographs, salient features are highlighted with drawings while thumbnail sketches appear in the margins and these are a great aid to rapid reference. Equipment is admirably dealt with from the viewpoint of a tyro confused by the wealth of gadgetry confronting him upon every dealer's counter and a neat table lets him know how his pocket will react to the acquisition of his initial set-up.

Written in a brisk and concise style, this volume contains a great deal more easily assimilated information than the majority of comparable size. Very good value for money!

"THE MARINE AQUARIUM" by Robert F. O'Connell. Published by John Gifford at 35s.

There is a dearth of literature on keeping marine fish and this book is likely to fill a widely felt need. Lavishly illustrated in colour, the latter half of the volume deals with a comprehensive selection of fish, describing their habits, etc. The opening chapters cover the preparation of artificial sea-water and give detailed descriptions of the apparatus for keeping it in condition. A good deal of space is afforded to the setting up of aquaria with excellent drawings for guidance as to furnishing. The main diseases to be encountered are described along with precautionary and curative measures although no more than five pages are devoted to this more sombre, albeit ever imminent, facet of the hobby.

"SEASHORE LIFE" by Gwynne Vevers. Published by Blandford at 21s.

Everyone must be familiar with the series in which this book appears. Uniform with its companion volumes on other realms of natural science, "Seashore Life" provides an ever-ready guide to more than 265 creatures which are illustrated with very fine coloured drawings. By reference to a guide number accompanying the illustration, one may find a concise note on the creature depicted by turning to the latter part of the volume. An indispensable companion when beachcombing.

# Breeding *Lacerta sicula* *campestris*

By H. G. B. Gilpin



I WAS FORTUNATE enough to find a number of these handsome Lacertids in a Brighton pet shop last April and hastened to secure a couple of healthy looking specimens, which were slightly larger than Viviparous Lizards, for myself. One had a bright green throat, that of the other being pale yellow. In other respects they were almost identical. Each had a bright, grass green back with an irregular line of dark brown patches running down the centre. The green band was bordered on either side by a series of fawn dashes along the lower side of which passed another line of large dark brown spots almost merging into each other. Below this came a further line of dark spots on a fawn background. The tail, long and tapering to a fine point, was brownish as was an area at the base of the tail extending a quarter of the way up the body. The legs were brown, sparsely broken by yellow spots, and the top of the head was olive green.

On reaching home the lizards were placed in a vivarium measuring 30 in. x 14 in. x 10 in. and heated to 70°F. This was already occupied by two geckos (*Tarentola mauritanica*), a Red-tailed Rock Lizard, a Viviparous Lizard and a young Ocellated Skink, bigger than its companions but not large enough to be dangerous. The floor of the vivarium was covered with a two inch layer of rounded gravel and it was furnished with several rocks, cacti, aloes and African Violets. A water vessel was supplied.

The two new-comers soon became familiar with their future home and from the first fed freely on mealworms, small spiders and freshly hatched locust hoppers. After a few days they also ate young stick insects. These make good food for lizards but most species in my experience are slow to take them initially although they eat them avidly after a few days, probably because their relative immobility makes it difficult for the lizards to see them.

The *campestris* were absolutely non-aggressive and appeared to take no interest in either each other or the fellow inhabitants of their quarters. In fact, as vivarium animals they were, and are, a great success showing little sign of nervousness. They are constantly on view and their bright colours and lively behaviour make them an asset to a collection.

Somewhat on the slim side when first obtained, the two lizards steadily increased in bulk, one of them to such an extent as to raise hopes that it would produce a family. Suspicions that one was on the way were confirmed by the

discovery of a pure white egg on May 27th. The egg was deposited on the surface of the gravel. On carefully spooning it out, it was found to measure four eighths of an inch in length and three eighths of an inch across its widest part. It was roundish in shape and enclosed in a membranous shell.

During the following week four more eggs, each almost exactly similar to the first, were produced. Like the first they were dropped, apparently haphazardly, on top of the gravel. At this stage the female delivering the eggs scratched out a burrow under a stone and spent much of her time inside it. No eggs were found in it subsequently and its only use seemed to be as a retreat.

Considering the number of lizards occupying the vivarium and the general activity resulting from their presence there was little likelihood of the eggs remaining unscathed in their exposed positions. This danger has been underlined in the past when eggs left on the gravel have been scuffed about by the other lizards or even, in the case of Green Lizards, buried by the parent several inches under the material covering the floor and subsequently disturbed by her further digging operations. Left in the open, even in a fairly secluded part of the vivarium, a further hazard is the loss of the eggs through undue drying.

In an attempt to give them some measure of protection on this occasion three of the eggs were carefully removed from the gravel with a teaspoon and transferred to a small pot of damp sand. More sand was added until the eggs were covered to a depth of half an inch. The pot was then suspended by a bent wire from the rim of the vivarium and the lid replaced. The supporting wire was thin enough to ensure that the gap between the lid and the rim of the frame was too narrow for even the smallest of the geckos to squeeze through.

In this way the eggs were maintained at the constant temperature to which the lizards were accustomed and were at the same time reasonably safe from accidental disturbance by the lizards. Twice a week, two or three drops of water were added to the sand to prevent it drying out too much.

The eggs left on the gravel soon shrivelled and dried up but in due course the eggs in the pot of sand hatched and on June 25th the first baby *campestris* was seen streaking for cover under the leaves of one of the plants. It was strong

Continued on next page

# Experiences in keeping PIRANHAS (*Serrasalmus nattereri*)

By William Mellor

JUST OVER FIVE months ago, I bought six *S. nattereri*. The fish were roughly  $\frac{1}{4}$  in. long and about five weeks old. I put them in a 40 gallon tank, lit by a 40 watt Gro-lux, and filtered by a Dynaflo Super Filter half-filled with peat fibre. Temp. 76-78 deg. Fahr.

The piranhas were fed on raw haddock and raw liver twice a day, occasional earthworms and live daphnia as a special treat. The haddock and liver were chopped-up to enable easy swallowing. The fish were very nervous but healthy, and most of the food was eaten with relish. Floating plants were provided for shade; Indian Fern, Water Lilies. Coarse gravel covered the bottom of the tank, but this was removed after a month to facilitate easier cleaning. The back of the tank was darkened by black carpet underfelt.

The fish were silver grey with irregular black spots, fins light red, except dorsal fin (clear), and tail fin (black with white splash in middle). The fins were ragged at first due to persistent nipping, but after a week of good feeding all battling ceased and the damaged fins healed up. After a month the piranhas were  $1\frac{1}{4}$  in. and the red in the fins was becoming stronger; after 2 months 2 in., body darkening from back down, swimming in a school, still very nervous.

I tried feeding them "Lucky" cat food and they liked it but very messy. Unfortunately, on 14th August, one

of them jumped out of the tank and wasn't found until later, dead.

Four months old, 2 $\frac{1}{4}$  in. long. I started feeding them small live goldfish and these they really enjoyed; 2-3 dozen goldfish per week. Very expensive!

Five months old, 3 in. long, eating well (too well!), and very healthy. Egg-shaped. As the body becomes darker the scales seem to sparkle as the light catches them and the belly is tinged golden-red; body spots fading slightly and the dorsal fin is black-edged. The piranhas still swim in a school, but, as from the start, one eye on me watching them, and one eye on their tank-mates; I don't blame them! Still nervous.

At the age of five months they started behaving like young Cichlids; circling each other, bodies vertical, fins quivering, charging and ramming each other with their mouths closed. From their behaviour I reckon I might have two males and three females. No fins are torn nor scales missing.

Now that the piranhas are six months old and perhaps approaching maturity, things should begin to get interesting.

I have evaluated the following points concerning young piranhas from the past six months of keeping them.

(a) Feed small young piranhas on small chopped-up pieces of fish or meat that can be easily swallowed. It is useless to throw in a largish piece of meat and expect them to tear it to pieces; when I examined the jawbone of my dead piranhas it was very brittle and fragile; the only exceptions to this rule are raw filleted haddock and raw liver, the former being flaky and the latter having the consistency of jelly.

(b) Keep the tank covered as piranhas are good jumpers. Preferably use floating plants as this is more natural.

(c) Piranhas like warmth, so Temp. at 75-80 deg. Fahr.

(d) Remove uneaten food as soon as possible.

(e) Frequent water changes are extremely beneficial; I remove half the water in my tank twice weekly (usually Wednesday and Sunday), and my filter works continuously.

(f) Give piranhas a good basic food, preferably fish, but don't forget the occasional earthworm or any insects you may find. I once had a 7 in. red piranha that used to go crazy about live daphnia, snapping them up one at a time. Most fish like occasional daphnia. No piranha I have ever had would touch Tubifex worms. Variety is the keyword when feeding fish.

I plan to raise my piranhas to maturity and try to breed them without having to split them up into separate tanks.

Perhaps other readers may find this article interesting and it may encourage more people to write about piranhas.

Continued from previous page

and very active and spent much of its time running over the rocks in the open part of the vivarium, retiring smartly into a convenient crack or fissure at the too close approach of one of the adult lizards. A second baby arrived on June 26th and a third on June 27th.

The newly born lizards were about two and a half inches in total length, the slim tail exceeding that of the combined head and body. Basically olive green in colour they were marked with four longitudinal lines of tiny, pale yellow spots and carried a darker olive dorsal line passing down the middle of the back. From the beginning the young lizards did well and fed readily on tiny spiders, very small mealworms and other forms of minute insect life. Unfortunately, eight days after the birth of the first one, I had to leave home for a couple of weeks and although all the adult lizards flourished, in the competent care of my temporary "stand-in," the babies were too young to survive the experience.

# Breeding Goldfish

By A. Boarder

ONE OF THE MOST important considerations of coldwater fishkeeping is the correct feeding of the fishes. More are lost by wrong feeding methods than from any other cause. It is not so much *what* food is given as to the amount which is given in a certain time. Nearly all beginners in the hobby just cannot resist giving food to goldfish whenever they see a fish at the top of the water or to one which comes to the front of the tank on the approach of the owner. To be able to feed goldfish correctly one must understand a little of the fish's make-up. Although goldfish are omnivorous, that is eating both animal and vegetable matter, they are not constructed like many of the carnivorous fishes. The latter have a fairly large stomach in which a large fish can be gradually digested. Goldfish do not have this feature and so are quite unable to take in a large amount of food at a time. Small amounts of food are taken and these must be repeated at fairly short intervals.

The amount of food which a goldfish can eat is also regulated by the condition of the water. Once this becomes polluted the fish cannot digest their food properly and so cannot take more. Polluted water lacks sufficient oxygen which is one of the most important items necessary to enable the fishes to feed well. What so often happens is that if the owner sees the fish taking food well he must give an extra amount immediately. As the fish are unable to take in such a large quantity at a time this extra food is left uneaten, perhaps to drop among base gravel where it remains and soon starts to decay, especially if the water is at all on the warm side. Once this happens the fish are unable to eat any more food because of the polluting water. Then if more food is offered and remains uneaten, things go from bad to worse and before long the fish are gasping at the surface and become unwell.

Enquirers often ask me how much food should be given and how often must the fish be fed. This is one of those questions which are impossible to answer unless one is in possession of all the facts, such as the size of the tank, the number and health of the water plants and the number of fishes. Also the position of the tank or pond can have some importance as fishes can eat more food when the water is on the warm side providing it is well oxygenated. It should never be forgotten that goldfish can browse over water plants and obtain plenty of nourishment from them in the form of tiny life, such as infusoria and soft algae.

The frequency of feeding is one of the points which often confuse beginners and it may be of interest to describe some of the results of experiments I have made over the years and also happenings which have been unexpected. I am certain that a goldfish in a well planted tank could go for six months at least without having been fed artificially. I have heard it said that fish cannot be left for a fortnight whilst the owner is away on holiday without them being fed. This is utter nonsense; any tank of goldfish left for a few weeks without any food being offered will be in better condition than when the owner went away, in all probability. The reason for this is that goldfish are excellent scavengers,

quite as good as any catfish, providing that they have not been artificially fed. If you leave a rather murky tank for a fortnight or more with goldfish in and they are not fed, you will find that the tank will have been cleaned up splendidly and all the plants look much healthier than they did before.

Let me give an example of how long goldfish can go without being fed. Last week I was feeding some young fantails in one of my old cisterns out of doors, when I noticed something red in a similar tank behind the one being attended to. Now I had not thought that there were any fish at all in this tank and as it was almost completely covered with pieces of glass, I had seen nothing before to indicate that there were any fish in it. No food had been given to this tank since I threw in some duck weed which I had taken from my breeding pond, after a spawning. I had forgotten about this action as I had plenty of other tanks to attend to. After seeing the red fish in the neglected tank I emptied it and found a dozen fantails from one and a half inches to three inches long. Some had changed colour and others were on the change. They were quite as good as the fish I had been feeding regularly. This tank is 30 x 24 in. with a water depth of 9 in. The tank had been partially filled to reduce its depth. I do not consider that deep water is of any advantage when breeding or rearing fish. There was no compost of any kind in the bottom and only duck weed and Hornwort (*Ceratophyllum demersum*), were there. The weed had been thrown in in May of this year and the fish were not discovered until the 20th October. From the time of hatching these fish had had nothing but what they could find in the tank. This could have consisted of infusoria, and algae etc. which they could find on the Hornwort. The fact that some of these fish were so large was a complete surprise to me, although I had had previous experience of finding a single fish or two in neglected tanks which had not been fed by me. However, this happening where a dozen fish had grown from fry to sizeable fish in four or five months without being given any food by me was a great surprise and one which may be very useful to remember when considering the leaving of goldfish unattended when on holiday.

What, then, can be learned by this experience? In the first place it may at last convince the compulsive frequent feeder to hold his hand for a bit longer. Do not imagine that your goldfish will die overnight if they are not being constantly fed. As for goldfish in an outdoor pond it is possible to keep such fish for years without having to give them any food at all. This is especially the case where the pond is well established with growing water plants. During the cold weather the fish can eat less than when the water is warm and so no food at all need be given to goldfish in a pond from October to March. The colder the water the longer will it take the fish to digest their food. I know that they will eat even when the pond is frozen over and will take a garden worm, but this will take the fish a long time to digest and there appears to be little value in feeding the fish at all during the period stated.

I am certain that the cause of many ponds becoming cloudy is only because too much food has been given which in turn has been uneaten and so polluted the water. Even green algae in the water is encouraged to form when the water conditions are bad through decaying food. The solution to good fishkeeping then is to go easy with the food and never give any unless you see that the fish take a little offered immediately.

Some remarks on

## *Tanichthys albonubes*

by Gunther Radek

FROM LITERATURE I know that *T. albonubes* is native in small mountain rivulets near Canton China. This brought a friend and me upon the idea to try if *T. albonubes* would survive a season in an outdoor pond, down here in southern Germany.

1967: April. One pair of *T. albonubes* spawned. 15 May hatchlings of 5 mm length were set free into a pond of 12 ft x 15 ft x 3 ft deep. This garden pond is partly shadowed by a big "Salix" spec. The submarine vegetation consists of *Elodea crista* and "meadows" of *Spirogyra*-algae. Except some Dragonfly-larvae, the pond was free of creatures. Water temperature was about 20° centigrade those days. Some days later weather turned to the worse, temperatures dropped down to 15° C. and some days later even to 10° C. We had to stand a period of rainy weeks. It was late in July that we got normal summer-climate at last. Within a few days the temperatures climbed up again and reached 24° C. On several occasions we observed small flocks of *T. albonubes*, which seemed to be alright. At no times were they fed, they just had to care for themselves. One Saturday afternoon, late in September, we cleaned the pond. The "fish-harvest" was poor to our bad surprise. All we got was a dozen grown-ups. It was probably the dragonfly larvae pest which made a welcome diet of the young fish. But these few examples were really strong and brighter in colour than their colleagues which had been kept in aquaria. So my friend and I decided to try our luck once more the next season.

1968: At four times from May to June, 300 hatchlings in all were set free. Also, some spawn was transferred into the pond. This time we did our best to free the *T. albonubes*-kindergarten from dragonfly larvae. On every sunny day when we had a glance at the pond, we looked for these pests and caught them by handnets. I guess it payed off. As the climate was really fine we decided to leave the young fish outdoors as long as possible. 2nd November and unexpected nightfrosts covered the pond with ice. What a disaster. There was no hope of saving any of our fish. So happier we were, when we finally got 28 pale adults still just alive. *T. albonubes*! The other day, inside a fairly large tank and at normal temperatures the saved-ones demonstrated that they were not only hard and vital but bigger and more brilliant in colouration. Never before had we such top class specimens. Of course, the quantity was poor but quality was better by far, compared with aquarium-raised *T. albonubes*. Also it was an easy job to bring them up. We did not cater for their food requirements, neither for filtration, heating or technical things like this!

It would be worth seeing if other so-called tropical fish would deliver equal results. I think perhaps *Gambusia affinis* and *G. holbrooki*, *Corydoras paleatus* and even *Hemigrammus caudovittatus*.

I was told that the climate in south-west England is milder than ours, that temperatures do not change as abruptly as they do over here, so there might be a better chance for aquarists and pondkeepers?

## PRODUCT REVIEW

A DEBRIS-LADEN planting medium quickly becomes a breeding ground for myriad organisms associated with disease and decay. It is possible, of course, to keep an aquarium in tip-top condition by periodic stirring of the compost followed by a good siphoning. But the aquarist fortunate enough to own a "Perfeketus" vacuum cleaner can do the job better in a quarter of the time with no loss of water and no mess.

This remarkable aquarium cleaner—remarkable both for its reliable performance and its low price—is operated by any ordinary air-pump. The air from the pump is forced along a narrow-bore flexible tube which has its outlet in the neck of a cleverly designed funnel-head attached to the bottom end of a rigid but extendable tube. As this funnel-head is moved over the aquarium floor the compost is sucked up and shaken free of all mud and muck, which is carried without a pause up the tube on the regular air-lift principle and deposited inside a thick nylon bag suspended from a splash-free bottomless cup. The muddy water that splatters into this container is returned to the aquarium crystal clear.

If the funnel-head is pressed too deeply into the compost some of it will be whisked up the tube into the nylon bag, but as there is not the slightest risk of this becoming detached from its retaining flange, then there is no need to say rude words or fret. The bag itself can be emptied and refilled in a jiffy.

The "Perfeketus" aquarium vacuum cleaner is one of the "Nuova" range of faultlessly-made aquarium accessories and sells at 22s. Trade inquiries about this product should be directed to TradeFish (Aquarium) Company, Burdon Road, Sunderland, Co. Durham. JACK HEMS.

## AQUARIUM GRAVEL REVIEW

"CALYPSO" AQUARIUM GRAVEL is produced by John Dowell & Sons Ltd., Chatsworth Road, Clapton, London, E-5. The gravel retails at about 1s. 0d. per lb., loose. An 8 oz. transparent bag costs about 1s. 6d., and a 16 oz. bag costs 2s. 6d.

This new gravel is crushed from a manufactured silica rock called "rock glass". The material is manufactured at very high temperatures so that the colouring agents are completely fused into the rock. This ensures that the gravel is colourfast—even if soaked in strong acid. Being composed of glass-like silica, the gravel is completely inert and non-poisonous; it will thus not affect the p.H. or the hardness of the aquarium water. The gravel gave me the impression of crystals of coloured bath salts. The colours available at present are light blue, light green, dark blue, dark green, chocolate brown, white, oyster pink and multi-coloured. The colours are not garishly bright, as in some manufactured gravels, but are fairly subtle.

A very attractive aquarium can be produced using black gravel. Perhaps this will be added to the colour range at a later date. The firm also produces small, coloured rocks which are made from the same material. These could be used in the same colour as the gravel, or could be chosen in a colour to contrast with the gravel. Such rocks weigh about 4 oz. to 6 oz., and cost about 9d. to 1s. 0d. each. B. WHITTING.

# WHAT IS YOUR OPINION?

By B. Whiteside



MR. J. P. NASH lives at Westbury-on-Trym, Bristol, and he thinks that to control algae in the aquarium, one should include one of the following fish: *Gyrinocheilus aymonieri*, *Otocinclus affinis* or *O. vittatus*. Their constant mouthing of the plants takes care of the settlement that Mr. Higham experiences (see August W.J.Y.O.?). One should not be worried that the above fish will only eat algae. Mr. Nash's *aymonieri* eat freeze dried tubifex, but the fishes' favourite food is algae. Excess algae in a tank is best removed with a piece of flexible plastic, and Mr. Nash notes that one manufacturer of plastic tanks is including a plastic algae scraper with each tank. Mr. Nash suggests that one does not use a razor blade. On the question of the growth of very young fish being held back when adult fish are kept in the same tank as the youngsters, Mr. Nash has only had experience with his gouramis tank which contains only gouramis, and a couple of pairs of guppies to provide occasional live food. Some baby guppies have occasionally been missed by the gouramis and these have grown as large as their parents. Mr. Nash concludes that the growth rate of the young guppies is not retarded by having 3 in. to 4 in. gouramis chasing them.

Regarding live foods, Mr. Nash thinks that young guppies are best, followed by brine shrimp, with white worms third on his list. The drawbacks with guppies are that the parents take up space in the tank, produce young only on occasions, and often eat their own offspring. Brine shrimp are very tedious to feed due to, their very small size but, with advice from "The Aquarist's Tropical Fish Queries" Column", Mr. Nash is attempting to grow brine shrimp on to a bite-sized meal. He thinks that their food value is as good as young guppies. White worms are meaty, easy to raise, yet are reported to cause fatty degeneration of the reproductive organs of fish, if fed frequently. (I've used them for many years and have never had a sign of evidence of any harm coming from the frequent use of white worms. I have a feeling that this may be a perpetuated myth). Daphnia are fourth choice, but they're only a tough shell and water, with very little good food value. Crustaceans and insect larvae are hard to come by and Mr. Nash is unable to comment upon them. "Live tubifex are sewer and sludge worms—need I say more," states Mr. Nash, in closing.

Iford, Essex, is the home of Mr. John Hill Stroot. He has an algae cleaner which he finds to be superior to razor blades, and other cleaners which he has tried. It costs very little to make Mr. Stroot's cleaner, and two could be made in one hour. Materials needed are: 1 small Plastic Padding kit; 18 in. x 1/4 in. diameter hardwood dowel; 1 aluminium plate—2 1/2 in. x 1 1/2 in. 1/8 in. thick; and 1 Scotchbrite pad—2 1/2 in. x 2 in. The surfaces of the aluminium plate are roughened with emery cloth, and one surface is covered with about 1/8 in. of the adhesive, and the Scotchbrite pad pressed firmly and evenly into the adhesive. The dowel is

now cut. One end is tapered flat at an angle of 30°. This enables Mr. Stroot to negotiate the angle iron flange at the top of his 36 in. x 15 in. x 15 in. tank frame. A thin layer of adhesive is now applied to the top of the plate, and a thicker coat to the 30° end of the dowel. The plate, with its pad is placed flat on a table, and the angled dowel is pressed firmly in position. The free end of the dowel is supported on, say, a book etc. Leave to dry and set for one hour, although the adhesive dries in ten minutes. In use, a gentle pressure and a circular motion, on the glass, removes even the most tenacious algae easily. Mr. Stroot ended up by giving his cleaner's joint a coat of polyurethane varnish, to ensure non-contamination of the water.

One of the questions posed in the October issue concerned suggestions for small reptiles suitable for keeping in a school biology laboratory. Mr. D. Race, who lives in Darlington, has some very detailed views on the subject. He begins by saying that North America has several snake species which do particularly well in vivaria, being hardy and coming from a temperate climate. The *Storeria* are a genus of small insect eaters which rarely exceed 1 ft. in length—10 in. being the average. The commonest and most widely distributed member is Dekay's snake—*Storeria dekayi*. This reptile ranges from south east Canada, south, to Mexico. Its food consists of insects and their grubs, earthworms and slugs. Due to its small size this snake needs very little room, and it is a good introduction, for children and nervous people, to the serpent family.

The greater snakes are possibly too well known amongst vivarium enthusiasts to need detailed description. Amongst the dozen or so species to be found, from southern Canada to central America, the pattern of from one to three light coloured longitudinal stripes, on a dark background, is almost universal. These snakes can attain a length of 3 1/2 ft., although 2 1/2 ft.—3 ft. is more usual. They are easy to feed as most kinds take fish—dead or alive, and they also like earthworms, but they should not be fed solely on these as they will soon succumb to a vitamin deficiency. These snakes will breed in captivity, given the right surroundings, and a large female can produce up to seventy 6 in. young, although the average is well below this.

Amongst the larger snakes which are easily kept in vivaria are the American water snakes belonging to the genus *Natrix*. There are eleven species of this snake in the United States, almost exclusively east of the Rockies. Although these snakes are not, as a whole, very long, the largest rarely attaining 5 1/2 ft., they are thick bodied and have a large viperish looking head—especially when annoyed. In this genus the species rarely exceed 3 1/2 ft. in length and there are some particularly beautiful types. Although not of gaudy coloration, their beauty lies in the more subtle blending of browns, blacks and greens. These snakes are exceptionally easy to feed as they have a gluttonous appetite for fish—dead or alive, also frogs, toads, newts and sala-

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manders. The only drawbacks in the keeping of these snakes are that newly imported specimens can be extremely pugnacious and strike viciously at the hand which feeds them, and, although they cannot do any real damage, with their small teeth, to a person unaccustomed to handling them a coiled 3 ft. *Natrix sipedon* with mouth agape, can be a little off-putting. Also they are not easily handled at first as they will smear one liberally with a foul-smelling anal secretion, if alarmed—similar to our own grass snake. However, as with all snakes, they soon quieten down and become extremely docile and can be handled easily and without fear. Some of the commoner and more easily obtainable of the water snakes are *Natrix sipedon*, *N. taxipilota*, *N. erythrogaster* and *N. cyclopion*.

For the aquarium there is a small but interesting turtle, *Kinosternon subrubrum*, the common mud turtle. Although not very attractive, this 5 in. turtle is interesting and seldom leaves the water, although a small sloping area of land, in the aquarium, is advisable. The turtle does not swim, but walks on the bottom looking for food. It likes worms, water insects, pieces of chopped fish and beef. In the wild they serve as scavengers. If annoyed, they can give off quite a stink, similar to its close relative, the stink-pot or musk turtle. A beautiful little skink, *Eumeces fasciatus*, the five lined skink, lives in the eastern states of the U.S. This small but attractive lizard is less secretive than most skinks, and can usually be seen basking and running about during the day. It derives its name from the longitudinal pale stripes on a dark background. The mother, upon laying her eggs, will coil round them and help to incubate them for several weeks. Upon hatching, the young have a bright blue tail which serves as a protection against predators. Any animal attacking the brightest part of the lizard will be left with the tail, as the lizard escapes. All of these lizards can be bought from dealers, during the summer months, and are not usually expensive. They will all do fairly well at a daytime temperature of 75°F, with a drop at night to 60-65°F.

Mr. Race says that he would like to see more articles on the care and behaviour of reptiles in captivity. On the subject of feeding lizards, Mr. Race does not favour the use of maggots as they have an unpleasant taste, and they are not easily killed, even when well chewed by the lizard. Mr. Race says that they can bore through the gut of a small lizard. Mr. Race has had green lizards which have regurgitated maggots several minutes after having eaten them, and the maggots have still been alive and wriggling. He suggests that maggots be allowed to form pupa and to hatch into flies before feeding to the lizards. The flies can be fed on sugared water or crushed banana. Maggots—about a couple of dozen—can be kept in gauze covered milk bottles, kept at different temperatures, and a constant supply of flies can be obtained. Flies are a better food and they also give the lizards something to do in chasing after them, this making interesting watching, as the lizards chase and scrap over the flies. Mr. Race ends his most informative letter by saying that he thinks *The Aquarist* to be a very good magazine.

The next three letters are from regular contributors, and the first comes from Mr. D. R. Hubble, of Sheppey, Kent, who controls the spread of algae by the method of supplying the optimum amount of light to the particular set-up. His 24 in. x 12 in. x 12 in. takes tank 120 warts of tungsten bulb lighting, for 0-24 hours daily. The tank has

a jungle of plants, and the only algae is that which is scraped from the front glass. Some is eaten by a sucking loach, but other tanks, without this fish, do not suffer unduly from the omission. Mr. Hubble has not used algicides, and he does use razor blades. On the question of any effect on the growth-rate of baby fish, raised with adults, Mr. Hubble says that he has found that the growth of the babies is retarded only if the fish are over-crowded, over-all. There is no effect if the fish have ample food, space etc. Mr. Hubble's favourite live food for his fish is mouse liver which, he maintains, is "live" (not too easy to get hold of, for the average aquarist, I would say). His choice of the more conventional foods is tubifex, daphnia, mosquito larvae, flies and maggots. He thinks that these are all good foods but that none is better than the others, and none is a sole food. Mr. Hubble always finds his fish in excellent condition when he returns from holiday, as his are all community tanks, but he thinks that things might be different if the fish were large cichlids. Reptiles suitable for keeping in a school would include the common tortoise—keeping in mind the possibility of hibernation, many small terrapins, grass snakes and, perhaps, one of the best, the slow worm. Mr. Hubble finds no attraction in keeping fish in a garden pool. To his mind, the beauty of such pools has little to do with the fish, little of which are seen any way.

Master P. K. Brown writes from York House, Wrekin College, Wellington, Salop, to say that he has never been badly troubled with the spread of algae in his tanks. He was interested in an article which I wrote in a previous *Aquarist*, concerning the control of algae by regulating the temperature of the aquarium water. He tried this method for a short time, and found that it worked for him, to a certain extent, but he gave up the method as he likes to keep his tanks at temperatures between 78°-80°F. He also tried commercial preparations for the killing of algae. These were fairly successful but expensive considering the number of tanks which he had to treat. Master Brown thinks that the best methods of controlling algae are by regulating the lighting carefully, and by having a good growth of higher plants in the aquarium. The scraper which he uses to clean the glass of his aquarium is designed to take both a plastic head, and a razor blade. The plastic head works well and



season's  
greetings  
for Christmas  
and the New Year  
to all our Readers



## What is your opinion?

continued from previous page

when it fails, the razor blade is used. Master Brown has also found that a piece of paper is useful for cleaning the glass, and it does not leave any streaks.

When Master Brown breeds any fish, he always separates the young fish from the parents, and does not return them until they are mature. Thus his fish are not retarded in their growth. At the moment he only uses two live foods for his fish—tubifex and daphnia. He considers the breeding of white worms to be a waste of time since he is still away at school. He uses large amounts of tubifex every week, and he obtains them cheaply from a local shop. He has never had any trouble from diseases from tubifex worms, but after a week, he finds that they begin to stink. Daphnia are plentiful round his area, and one can get a couple of buckets full every day. He has found that both of these have a high food value, and that his fish come on well when fed with them. During the summer he feeds his fish almost exclusively on live food, supplemented by the odd feeding of flake food to add constituents which may be missing from live food. At his school they have tried most reptiles—or so it seems. Some of those kept include: Caimen, iguanas, lizards, frogs, toads, snakes, and a host of others. Many other animals have also been kept, and Peter looks after most of them. He finds that most are fairly easy to look after, as long as their needs are catered for, and he says that there was, generally, a lot of interest shown in the reptiles kept in his school. "Unfortunately," Peter says, "the Caimen did not like our headmaster!" (The favourite animal in the school in which I teach, is a convict cichlid which has grown large by eating its tank-mates—about £4 worth, and all the plants. No pupil has been lost, as yet!).

The type of algae which has given most bother to Mr. J. A. Higham, of St. Helens, Lancs., is the blue-green. Recently he suffered a very severe outbreak in a well established tank. It was probably introduced, through his own carelessness in not paying attention to washing newly bought plants, he thinks. After trying to clear the algae, the hard way, by daily removal and by reducing the lighting, he finally fell back on chemical means. The algicide he chose was "Algo Stop", and, following the maker's instructions, he used the prescribed amount for his 100 litre tank. The effect was spectacular; by the next day the algae, which had been coating plants, rocks and glass, was virtually gone. He siphoned the remains from the bottom, and changed half of the water, but within a few days the plants—*Nomophila striata* (Giant Hygrophylla)—began to shed their leaves and this continued until the whole tankful had dwindled to a couple of miserable stalks. Faced with the problem again, Mr. Higham would use the same remedy, but in a weaker concentration—a drop at a time—as it seems so immediately lethal to the lower plant life, while apparently resisted somewhat by the higher plants. (I had an identical—in every respect—experience, the results of which I published in *The Aquarist*, about a year back). Mr. Higham's *Nomophila striata* steadily recovered, and is now approaching its former healthy state. Mr. Higham says that he has heard that hard water is conducive to the growth of algae and he wonders how important this factor is in relation to the usual ones of excess light, over-fertilized water, lack of higher plant life etc.

Having scratched his aquarium glass by using razor blades, Mr. Higham has long since given up their use, and he now uses a handful of nylon wool which he finds much easier to use as it covers a larger area at a time, and, being white, shows up the parts likely to be missed by the blade method. On the question of live foods, Mr. Higham thinks that white worm is the easiest to produce in usable amounts, over the whole year. He thinks that the usual warnings about over-feeding with white worms are a little exaggerated. The second live food on his list would be the *Gammarus* shrimp—mainly because it is one of the few easily obtainable food creatures in his industrial area. He gets his from a good, clean field drain which contains no fishes. He tries to sort out the shrimps, keeping them for a few days in clean water with a dash of disinfectant ("Diseasolve") before feeding them to his fish. He likes these shrimps because they come in such a good range of sizes suitable for all types of fish from guppies to large cichlids. They are also tough creatures and not likely to die in hidden corners of the tank—in fact, any which escape the fish are likely to earn their freedom by doing a spot of scavenging on the side! Although he has never had any trouble from introducing diseases from this source, he is always on the lookout for danger signs when collecting live foods from the wild. Every summer he produces a modest stock of daphnia, in various containers, but never enough to rely on without other and more plentiful material. Mr. Higham has also tried raising wingless fruit flies, and while finding them easy to produce in large numbers, he seemed to lose as many about the house as he fed to his fishes. He can say that his fish get live food all the year round, and very rarely have to be given dry food of any kind.

Mr. Higham invariably leaves his fish to fend for themselves when he goes on holiday, and he has always found them quite unchanged by their week's fast. He tries to feed them up during the preceding couple of weeks by giving them as much variety as possible, and as his holiday coincides with the peak of the live food gathering season, this is usually a simple matter. Plants too seem to come to little harm from a week in the dark—just a trifle leggy, perhaps, but this soon passes off. He usually leaves the undergravel filter working, and it provides a bit of aeration too, but he does not think it really necessary.

Well, those are all the letters for this month. Perhaps I could jot down my own opinions on some of the topics covered. I find that algae can often be controlled by keeping a sucking loach in an aquarium. If this fails, I exercise some further control over light, temperature and dissolved mineral salts' content. If all else failed, I would use an algicide—but at a strength somewhat weaker than that given on the packet. The concentration can be increased if necessary. I'm afraid that I still use the old razor blade cleaner. It works, and any scratches on the glass have to be looked for if one desires to see them. I have found that young guppies seem to grow more quickly when they are not raised with adult fish, so I would suggest that the adults do produce some substance or substances which slow down the growth of the babies. Perhaps this, in the wild, would prevent over-population of areas of water, as the small fish would stand more chance of being eaten than they would if they were fully grown. The normal waste from any fish, in the confined space of an aquarium, is bound to have some effect on all the living inhabitants of the same water. I believe that some research into this phenomenon

in carps, has been done, but I never traced its publication. Perhaps some reader could give the published source. I use white worms for my larger fish, and brine shrimps for young ones. Both are very easy to raise in quite large quantities, and both seem to make the fish grow. There are no shops in my town which sell live foods such as tubifex etc., and so I only get the odd lot of tubifex and daphnia when I make the twenty mile journey to Belfast. Unlike other writers, I do use a wide variety of granular, flake, freeze dried and even liquid foods. I think that these are necessary to supplement live foods; most fish are omnivorous, and need a mixed diet—not just "meat" alone. I have trouble with school fish when the school closes for ten weeks' summer holidays. Any other school animals can be taken home by pupils, but several tanks of tropicals can't very well be taken home. Thus I usually find myself requesting the assistance of the school secretary, the caretakers, and the cleaning people, to feed the fish for parts of the holidays. When the school is closed completely, I have to make several weekly visits there, and open up to feed the fish. We have no reptiles in school at present, only the fish and "Ginger", the school's hamster. Looking ahead, I realise that it will probably be Christmas

before you read this, so I'll take this opportunity of wishing all readers a happy Christmas, and a wonderful 1970. May there be peace in the world—especially in my own home, Ulster. My thanks to those who sent letters in the past year—especially the regular writers. Please keep them coming in 1970. Perhaps your opinion is the answer to some reader's problem.

Let's have your opinion on the following: (1) What have you thought about aquarium plants ordered from the larger firms, by post? Have you been pleased with the quality and the price? (2) Which fish would you nominate as being hardest to net from a planted aquarium? (3) I heard a dealer say recently that the quality of smaller tropicals was dropping off from what it used to be. Would the more experienced aquarists agree? (4) I've often heard various wives and mothers complain about aquaria all over the house. Where is your main battery of tanks, and in how many rooms do you have a tank? (5) Has glass wool any more use as a filter medium, or has nylon wool taken over to advantage? (6) How do you support the cover-glass of your aquarium? (7) What have been your experiences using artificial aquarium gravel?

## News 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.

ENTRIES, amounting to approximately three hundred, were received for the Open Show of the Cambridge and District A.S. The Furnished Aquaria section did reasonably well and made a nice addition to the Show, Harlow Club being successful in the Tropical Furnished Aquaria and winning the Cambridge and District A.S. 21st Anniversary Challenge Shield. Most Clubs were successful in being amongst the prize winners. The Best Fish in the Show was a Pantail exhibited by Johnston Bros. The Club displayed many colour photographs with explanations, Club trophies, information about the Goldfish Society of Great Britain, the Fancy Guppy Association and the British Killifish Association. The P.B.A.S. badge board was on display. There was a very good attendance by the general public.

MEMBERS of Nottingham and District A.S. have been busy and successful at various shows and Society meetings. At the Hocknall and Bulwell Show the Nottingham entries gained seven firsts, two seconds and two thirds. Mr. C. Hill, the Society President, recently gave a talk to the Leek and District A.S. on Cold-water Fish and was also guest speaker at a meeting of the Allerton 41 Club.

THIRTEEN members of Ealing and District A.S. made a trip to the British Aquarists' Festival at Manchester, and all were impressed by the quality of the fish exhibited, both in size and colour, and were completely "bowled over"

by the Aquarium at Belle Vue, which was worth the effort of the journey alone. At the meeting members heard a fine talk by Roy Skipper, of the House of Fishes, on his pet subject, Discus. The only snag, was that after hearing about such achievements, and seeing some magnificent photographic evidence, one tended to feel a bit inferior!

However, it did not cloud the appreciation of the evening, and from the keen interest shown, and pertinent questions put to Mr. Skipper, there is every chance that some members are seriously thinking of keeping these beauties. Table Show Results. A.O.S. Catfish/Loach: 1 and 2, T. Tagg; 3, R. Sellers. A.S. Livebearers: 1, Mrs. D. Cruickshank; 2, J. Hestley; 3, J. Batts.

ALL reports given at the annual general meeting of the Basingstoke A.S. emphasized the highly successful year the Society has enjoyed. The Chairman, R. Ridley, reported record attendances throughout the year which justified the move to larger premises at the White Hart, London Road. He thanked the Committee who had worked hard to make the Society successful especially the Secretary, H. P. Gough, and Show Secretary, A. Blake, who had also been elected a "B" class Show Judge by the Federation of British Aquarist Societies. The Treasurer reported a very satisfactory financial position with the Society having nearly double the amount of cash in hand compared with last year. Members had entered more fish in Shows than before and Basingstoke

was now appearing regularly in the award lists of events throughout the South of England. Among all the success stories the Secretary noted the one failure—that of the Junior Section. This setback, however, was due to be tackled with vigour and the Section was being restarted under new leadership.

Before the election of new officers the annual trophies were presented to R. Ridley, winner of the Breeders' Cup; G. Clewer, the Championship Cup for the best fish in the Society and to A. Blake, the Cup for gaining the highest total of points for the year in Table Shows. Officers elected for the coming year were: Vice-President, R. Ridley; Chairman, D. Walls; Vice-Chairman, A. Blake; Secretary, H. P. Gough, 94a Romani Road, Basingstoke; Treasurer, Mrs. J. Lovgrove; Show Manager, D. Walls; Show Secretary, A. Blake; Junior Section Leader, G. Payne; Committee Members: Mrs. P. Gough, G. Clewer, A. Mustart and N. Strad. Delegate to the F.B.A.S. Assembly, A. Blake and to the Three Counties Group, D. Walls and T. Sweeney. Hon. Auditors elected for 1969/70 were T. Brey and A. Marshall.

RECENTLY a party from Bradford and District A.S. spent an enjoyable evening when visiting the fish houses of Horace and Bruce Jordan in Hadfield. There is also a night out in December for the Annual Dinner at which the Christmas Draw will take place. The Society also congratulate their members who this year took four firsts and a third at the B.A.P.

THERE was a record number of entries, totalling 409, at the Stone A.S. Open Show. The results were as follows: Plants, A.V.

**PROVISIONAL DATE**  
**THE AQUARIST & PONDKEEPER**  
**FISHKEEPING EXHIBITION**  
**10-12 JULY 1970**  
**ALEXANDRA PALACE**  
**LONDON N.22**

**Aquatic:** 1, R. Anthony (Telford); 2, J and 4, E. G. Leadley (Stone). **Breeders (Livebearers):** 1, Messrs. Sheldon and Willets (Avon); 2, 3 and 4, P. J. Duffy (Alfreton). **Breeders (Egg-layers):** 1, Brown Brothers (North Staffs.); 2 and 3, K. J. Harvey (Stone); 4, Mr. and Mrs. Simpson (Bedworth). **Pairs (Livebearers):** 1, W. Ormsher (Southport); 2, D. Highfield (Wednesbury); 3, P. J. Duffy (Alfreton); 4, Mr. and Mrs. Simpson (Bedworth). **Pairs (Egg-layers):** 1, R. Shakespeare (Bedworth); 2, A. Smith (Stone); 3, P. Skinner (North Warwick); 4, W. Tyson (Wednesbury). **Guppies:** 1 and 4, P. J. Duffy (Alfreton); 2, Mrs. F. Dean (Tarnworth); 3, T. A. Nason (North Warwick). **Platies:** 1, M. Scott (Telford); 2, D. Colclough (Unattached); 3, I. Brough (Stone); 4, J. Summerfield (North Staffs.). **Swordtails:** 1, L. Kaye (Top Ten); 2, M. Skivington (Alfreton); 3, N. W. Plant (Stone); 4, Goodwin Brothers (North Staffs.). **Mollies:** 1, L. W. Bull (Atherstone); 2, Mr. and Mrs. K. Ankers (North Staffs.); 3 and 4, D. Colclough (Unattached). **Rasboras:** 1, R. Shakespeare (Bedworth); 2, L. W. Bull (Atherstone); 3, B. C. Roberts (Unattached); 4, Colclough Brothers (North Staffs.). **Danios W.C.M.M. Rainbows:** 1, P. Reynolds (Dukeries); 2, P. Rogers (Stone); 3, A. S. Dawes (Wednesbury); 4, W. J. Ash (Leek). **Toothcarps:** 1, N. W. Plant (Stone); 2, T. Harvey (Stone); 3, V. Catts (B.K.A.); 4, S. Dean (Tarnworth). **Fighters:** 1, J. Bailey (North Staffs.); 2, H. Ledger (Top Ten); 3 and 4, Goodwin Brothers (North Staffs.). **A.O.V. Amabantis:** 1, K. Johnson (Stone); 2, K. Hallam (North Staffs.); 3, N. Furness (Longbridge); 4, F. Ledger (Top Ten). **Barbs (under 3 in.):** 1, P. Skinner (North Warwick); 2, Goodwin Brothers (North Staffs.); 3, B. C. Roberts (Unattached); 4, Goodwin Brothers (North Staffs.). **Barbs (over 3 in.):** 1 and 4, J. Sanders (Stone); 2, P. Rogers (Stone); 3, K. J. Harvey (Stone). **Cichlids (Dwarf):** 1, D. Aldred (Stone); 2, Mrs. P. Roberts (Unattached); 3, F. Ledger (Top Ten); 4, R. Mowby (Wednesbury). **Cichlids (Large):** 1, W. Ormsher (Southport); 2, T. Haydock (North Staffs.); 3, Mr. and Mrs. K. Ankers (North Staffs.); 4, R. J. Hough (North Warwick). **Characins (under 3 in.):** 1, D. Highfield (Wednesbury); 2, K. Attwood (Longbridge); 3, K. J. Harvey (Stone); 4, Master Roberts (Unattached). **Characins (over 3 in.):** 1 and 3, R. J. Hough (North Warwick); 2, K. Attwood (Longbridge); 4, P. Rogers (Stone). **Labes and Sharks:** 1, Colclough Brothers (North Staffs.); 2, T. Harvey (Stone); 3, I. Brough (Stone); 4, B. Sheehy (Coventry). **Corydoras Catfish:** 1, Goodwin Brothers (North Staffs.); 2, R. Shakespeare (Bedworth); 3, E. Sheehy (Coventry); 4, P. Reynolds (Dukeries). **A.O.V. Catfish:** 1 and 4, D. Highfield (Wednesbury); 2, A. Ankers (North Staffs.); 3, R. J. Hough (North Warwick). **Loaches:** 1, Goodwin Brothers (North Staffs.); 2, N. W. Plant (Stone); 3, R. Shakespeare (Bedworth); 4, J. Summerfield (North Staffs.). **A.O.V. Tropical:** 1, R. Woodbridge (Coventry); 2, Mrs. and Mr. Ankers (North Staffs.); 3, E. Sheehy (Coventry); 4, P. Reynolds (Dukeries). **Joskie Trophy and Aquarist Gold Pin for Best Fish of the Show** awarded to R. J. Hough (North Warwick), Piranha.

**THE Hastings and Bexhill A.S.** now holds two meetings a month and at present these are packed to capacity. Many interesting meetings lately have included lectures by Mr. Armstrong from Farnborough and Mr. A. G. Jessop, Chairman of the F.B.A.S., who needs no introduction!

Other activities have included the arranging of seven aquaria at the Hastings Autumn Show and the "Home Aquaria" competition which was won by Mrs. Gerig. Second was G. Pryke and third was Mr. Gerig. This competition was judged by Mr. Bourn of Ashford who announced the results, with slides of the aquaria at a recent meeting.

"AQUARIUM Construction" was the subject of a talk given by a Chester and District A.S. member, P. Tomlinson, when he described his method of constructing a chipboard and polyurethane-coated aquarium. C. Bosyer, also a

club member, lectured on his successes in breeding and rearing many varieties of tropical fish.

Recently Northwich A.S. visited Chester and took part in their Intra-Club Quiz and Table Show which, after a friendly battle, was eventually won by Chester. A taped lecture on White Spot was held on October, Mr. Parkes and at the beginning of October, Mr. Parkes and Mr. Mulla from Merseyside A.S. gave an informative talk on keeping and showing large fish and this was illustrated by a large selection of their own slides. E. V. Stokes, a club member, provided an extensive plant leaf quiz containing over seventy varieties of aquarium plants. On the first meeting in November, F. Williams, Curator of Chester Zoo, kindly gave a conducted tour behind the scenes of the Aquarium. Meetings are held every first and third Thursday of the month at Lower Bridge Street, Chester. Secretary: Mrs. A. Dutton, The Limes Farm, Tarvin, Chester.

**THE Wellingborough and District A.S.** Newsletter contains a cheerful report on the growing strength of the Society. There is a healthy increase in the balance at the bank despite the purchase of supplies and equipment for future use. In addition almost £80 has been handed over to Charity. Plans for next year are already in hand with the possibility of more outings.

AT the October meeting of the Atherstone A.S. A. W. Skinner of Birmingham gave a very interesting talk on the breeding of Barbs and later, with his son Paul, judged the Table Show which was an eliminator for the final M.A.L. show at Hedworth. The results were as follows: **Rasboras, Danios, W.C.M.M. and Killifish:** 1, L. Douce (W.C.M.M.); 2, A. Trotman (Aph. Australis); 3, A. Trotman (Brilliant Rasboras); 4, Master N. Trotman (Scissortail), Catfish and Loaches: 1, A. Trotman (C. Punctatus); 2, Master L. Spencer (Khuli Loach); 3, A. Trotman (C. Paleatus); 4, E. Davis (C. Auratus). **Breeders' Livebearer:** A. Trotman (Yellow Wag Platies).

**THE last meeting of the Vauxhall Motors Aquarist Section** was very well attended by about forty members.

The Table Show was very varied tropical and best fish in club. This produced the largest number of fish ever seen in the club and these were judged by B. Sargent of the Bletchley Club. First prize and best fish in club award went to Tony Philip who entered a Pike Cichlid. The second award went to Mrs. A. Jeffs with a Pandras and the third to A. Jeffs (Zillie Cichlid). M. Hawkes (Platy) was fourth. The speaker was P. Cavener of B.K. Tropicals, Hitchin, who spoke on Constructing and Maintaining a Fish House and on the relative costs of heating. He also gave a very good guide to the best ways of commercial breeding, in order to cover the fish house outlay.

An excellent discussion followed the talk and concluded a very pleasant evening.

**THE Bracknell A.S.** had an enjoyable and successful year. They have won the Three Counties Bottle League Cup for the seventh consecutive year, and members have been successful in open shows. Their own Show was very well attended, and M. Carter, the Programme Secretary, has provided a full and varied programme. T. Duffy did an excellent job in setting up a Furnished Tank for Bracknell Club's entry for The Aquarist and Pondkeeper Show at Alexandra Palace, which came FIRST.

The newsletter "The Bracknell Harlequin" is progressing very strongly, thanks to L. Jordan, the Editor and Mr. and Mrs. Carter. At the Annual General Meeting, the Chairman, J. Norris, retired and is succeeded by L. Jordan. The Secretary is Mrs. Jordan, 62, Fernbank Place, Ascot, Berks. Telephone: Winkfield Row 3400.

**THE Gloucester A.S.** held its Annual General Meeting in September, when the Committee

was re-elected en-bloc with two further members who were also elected to serve on the Committee. The Chairman, Michael Bookes, gave a review of the Club's Activities since its formation in May 1969, and the meeting concluded with the showing of the Slide Show "The American Scene."

The October meeting of The Gloucester A.S. was completely taken up by a Fish Show, at which invited members of the Bishops Cleeve A.S., Stroud and District A.S., The Forest of Dean A.S. and I.C.I. A.S. gave their support. Although the programme was not the original one ordered, "The Captive River" and "Report from America—Man in the Sea" were well received and thanks are extended to all those who gave their support. The Society have now secured the St. James Parish Hall, Upton Street, Gloucester, for future meetings and this has necessitated a change of the meeting day from first Wednesday in month to first Thursday in the month. The next meeting will be held at the new venue on Thursday, 6th November, commencing at 8 p.m.

**EARLY in October Brighton and Southern A.S.** held a Table Show for Egg-layers, Breeding pairs, which was a great success, there being 25 pairs of fish on the bench.

The results of this show were as follows: 1, D. Soper (Choquer Barbs); 2, B. Cox (Yellowtail Rasboras); 3, V. Aldis (Pel. Kribensis); 4, Mrs. Madison (Tr. Levert). **Junior Award—D. Latham (Cherry Barbs).** On the same evening there was also a show for rooted aquatic plants, the results of which were as follows: 1, D. Soper (Najas); 2, D. Soper (E. Densa); 3, C. West (Najas). At the next meeting in October Mr. Katritzky presented an excellent series of slides on plants, both aquatic and land-growing, with accompanying lecture.

**THREE new members** were welcomed at the October meeting of the Hereford and District A.S. which was quite interesting. A film show quiz was held and the Table Show was for a pair of livebearers and labyrinth fish. The Annual General Meeting will be held in December when the winners of the Table Shows will be announced.

**MEMBERS of the Leamington and District A.S.** were entertained recently by a travel film on South Africa shown by Mr. and Mrs. Billington, and the evening was a great success. The November meetings included a talk on Plants and Reptiles and Amphibians.

**THERE has been a change of Secretary in Roehampton A.S.** The new Secretary is A. Morgan, 9, Sandy Lane, Hampton Wick, Kingston-on-Thames, Surrey. Anyone wishing to join the club will be welcomed. They meet on alternate Wednesdays on the Alton Estate, Roehampton, in the Old People's Club House. Meetings to end of 1969 are 12th, 26th November, 10th and 17th December.

**MEMBERS of the Enfield District A.S.** heard a very interesting and helpful lecture from L. Smith of Bethnal Green, who gave a number of tips on setting up a tank, not only for the home but also for Open Shows. The Table Show was Characins and Cichlids, the results being as follows: Characins: 1, 2 and 3, J. Whitaker; 4, C. Collins. Cichlids: 1, B. Bird; 2 and 3, Howe; 4, J. Whitaker.

**THE Kings Lynn and District A.S.** was formed in June this year and has a rapidly

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increasing membership. Meetings are held on the first and third Tuesdays in the month at the Fairstead Community Centre, Fairstead Estate, and the Committee is as follows: Chairman: B. Dunlop; Secretary: G. Rothwell, 42, Higham Green, Fairstead Estate, Kings Lynn; Treasurer: J. Hammond; Show Secretary: B. Capper; B. Sumner; G. Lewington. Table Shows are held once monthly at the above address.

**THE Goldfish Society of Great Britain** held their Annual Convention at Sutton, Surrey, in October. The Technical Co-ordinator, J. Bamfield, gave a talk on his recent breeding experiments and his findings, and the Chairman, G. H. O'Neill, showed slides of American commercial goldfish breeding establishments, together with a film featuring the premises of various society members in this country. The fish show itself was well attended with 150 fish on the bench. These were judged by Messrs. Betts, Brown, Esson and Emery and the results were as follows: Singletails: 1 and 2, Miss D. Morris; 3, W. Leach; 4, Mrs. A. Seed. Metallic Twintails: 1, S. Tibble; 2, Miss Morris; 3 and 4, J. Linale. Nacreous Twintails: 1 and 4, T. Halpin; 2, H. Jago; 3, Miss D. Morris. Globe-eyes: 1, B. Herbert; 2, H. Jago; 3, J. Linale; 4, S. Tibble. Brambleheads: 1, J. Linale; 2, Miss R. Berger; 3, T. Halpin; 4, R. Whittington. Pearlscales: 1 and 4, M. Clive; 2 and 3, K. Speaks. Celestials: 1 and 2, J. Linale; 3, T. Halpin; 4, J. Bamfield. Pom-Poms: 1, Mrs. R. Smith; 2, J. Bamfield; 3 and 4, T. Halpin. Bubble-eyes: Land 2, A. Long; 3 and 4, T. Halpin. Common Goldfish: 1, Mrs. A. Seed; 2, T. Halpin. Common Goldfish: 1, Mrs. A. Seed; 2, T. Halpin. London Shubunkins: 1, 2 and 3, Mrs. P. Whittington; 4, W. Leach. Comets: 1 and 2, R. Dudley. Metallic Fantails: 1, R. Dudley; 2, S. Freeman; 3, Mrs. A. Seed; 4, S. Tibble. Nacreous Fantails: 1, S. Tibble; 2, H. Jago; 3, R. Dudley; 4, B. Herbert. Orandas: 1, Miss D. Morris; 2 and 3, A. Long.

**THERE** was a good attendance at the October meeting of the **Bournemouth A.S.**, when the Secretary, R. Matley, gave a report on a recent inter-club event, held at Salisbury, between Bournemouth A.C., Salisbury and District A.S., and the New Forest A.S., which resulted in a win for Bournemouth A.C., for the first round, with Salisbury second and the New Forest A.S., third. After the Secretary's report, B. Coombes gave a talk on coldwater fishkeeping, illustrated with some coldwater species.

The results of the Home Furnished Aquarium Competition were then announced, and a silver rose-bowl was awarded to Mr. Watkins for first place, with H. Earl and Mr. Pink second and third respectively. The Table Show of the Month was for Catfish and Loaches, and the results were: 1, H. Earl (Corydoras Aeneus); 2, Mr. Moran (Botia Loachata); 3, Mr. Watkins (Corydoras Paleatus).

**THE** October meeting Table Show of the **Barnsley T.F.S.** was for Killifish and A.V. Female. Mr. Duncan was first and third, Mr. Holmes being second. The raffle was won by Mr. Holmes. Mr. J. Wike of Huddersfield gave a talk on live foods and rearing young fry. The Open Show date for next year is 19 July—venue to follow.

**DURING** the first three months of its existence, the **Hemel Hempstead A.S.** has become a flourishing Society with over seventy members.

**THE SAFE CURE FOR WHITE SPOT IS**  
  
 Hillside Aquatics London N12

December, 1969

Meetings during this time have included a talk by R. Skipper on furnished aquaria, illustrated by slides, a talk by C. Withers of the West Herts. A.S. on showing fishes, a "Brains Trust" with the East London A.S., a slide show and talk on garden pools, and a talk on herpetology (with live specimens) by junior members David Wainwright and Ian Sellick.

At an Extraordinary General Meeting held to elect Committee Members for the remaining nine months of the year, a new Chairman, E. Levey was elected, but there were no major changes on the Committee. After the election, a quiz soon developed into a lively discussion. At another meeting, a Table Show for Labyrinthists and livebearers was judged whilst A. Cusit gave a talk on aquarium photography, illustrated by his own photographs and slides. The winner of the labyrinth class was T. Craddock, with a Dwarf Gourami, and he also took second place with a pink Kissing Gourami. Third place went to P. Tucker with a Giant Gourami. First in the livebearer class was A. Dibley with a Green Sailfin Mollie. M. Kelly came second, also with a Green Sailfin Mollie, and Mrs. Mary Whizby third with a Red Wagtail Platy. The Society wish to thank Mr. H. White, the Chairman of Herndon A.S. and Mr. D. Gorman, who came on their own club night to give advice and to show their slides of exhibits at the Aquarist's Society Show.

At another meeting, while a table show for Characins and Catfish was being judged, A. Tuff gave a talk on live foods. In the Characin class, L. Bamfield was first with a Congo Tetra. A junior member, I. Sellick, took second and third places with a Rosy Tetra and a Red-Eyed Tetra. T. Craddock won the Catfish class and also took third place, with Kuhl's Loaches, and L. Bamfield was second with a Red-Tailed Shark.

There is still plenty of room for new members, whether novices or old hands at fishkeeping, and anyone interested should contact the Society Secretary, L. Bamfield, at 54, Chipperfield Road, Apster, Hemel Hempstead.

**FOR** their October meeting the **Privateers A.S.** enjoyed an interesting and informative talk on the Anatomy of Fishes, which was given by P. Robinson. The result of the Table Show, which was "pairs", was as follows: 1, J. Robinson; 2, L. Taylor; 3, P. Zumbino. An added attraction was a furnished show for competition, the result being: 1 and 2, Mrs. Whitaker; 3, Mr. Burton.

**AT** the monthly meetings of **Aireborough and District A.S.**, the President, Ray Lister, has had the pleasure of welcoming new members at every meeting so far this year.

Programmes have been varied, recently Mr. and Mrs. J. M. Skinner were well received when they talked about their experiences, mainly pertaining to furnished aquaria. At the November meeting local biologist Mrs. Sephton will be making a welcome return when, with the aid of slides and/or film, she will be giving a talk on "Microscopic animal life, collected from water." Earlier this year Mrs. Sephton made her first visit to the society and presented a talk and film on "Microscopic plant life and algae." A future speaker at the society meetings will be chemist Mr. Prince from the local water board.

Other activities of the society have included an interesting visit to the "Trout Hatcheries" at Pickering, and a display of fish, plants and furnished aquaria at the local flower show.

Information about the society will be sent to prospective new members upon request. New members and guests can be assured of a warm welcome at any of the meetings, which are held the first Thursday of each month, in the Co-operative Hall, Guiseley, Nr. Leeds. The Secretary is G. E. Walker, 2a, West End Terrace, Guiseley, Nr. Leeds, LS20 8LX.

**DESPITE** the non-arrival of a hired slide show, members of **Tonbridge and District A.S.** had no complaints about their entertainment. An alternative show had been arranged by J. Bellingham and I. T. Mathieson and covered

tropical and marine fish; the Club visit to London Zoo and a Safari in East Africa.

The Club Table Show was particularly good, with a large entry in the plant class and two new names on the Club Championship table, I. Getley, who won the cuttings or floating plants, and A. Pockham, who was second in the class for Mollies.

The other winners were Mrs. D. Mathieson and I. T. Mathieson, who won the classes for Loaches and Mollies respectively.

**THE** new Secretary of **Colwyn Bay and District A.S.** is R. F. Evans, 16, College Avenue, Rhos-on-Sea, Colwyn Bay. The Society meet at the Beaumaris Hotel, Lawson Road, Colwyn Bay and new members and any visiting aquarists are welcome.

**THE** award for entries at the second **Cleveland A.S. Open Show**, are as follows:

The plaque and the Aquarist Gold Pin for Best Fish in Show was awarded to J. A. Whitley (Aireborough) KRIBHNSIS, Guppy; 1, G. Simpson (Peterlee); 2, N. Flett (Stockton); 3, G. Monk (Aireborough); Mollies: 1 and 2, E. Turnbull (Hartlepool); 3, A. Turner (York); Swordtails: 1, R. Robinson (Privateers); 2, I. Pines (B. Auckland); 3, E. Turnbull (Hartlepool). Placets: 1, E. Thompson (Cleveland); 2, J. H. Whitley (Aireborough); 3, Mr. and Mrs. Hollis (Peterlee). A.O.V. Livebearers: 1, R. Robinson (Privateers); 2 and 3, G. Monk (Aireborough). Small Barbs: 1 and 2, J. H. Whitley (Aireborough); 3, E. Thompson (Cleveland). Large Barbs: 1, F. Sonley (Ind.); 2, J. H. Whitley (Aireborough); 3, C. Simpson (Peterlee). Small Characins: 1, L. Linwood (Peterlee); 2, A. Gibson (Huddersfield); 3, Mr. Duncanson (Priory). Large Characins: 1, G. Monk (Aireborough); 2, R. Robinson (Privateers); 3, Mr. Duncanson (Priory). Rasbora and Danios: 1, C. W. Buck (Stockton); 2, A. Coates (Cleveland); 3, J. Haley (Cleveland). Sharks and Flying Foxes: 1, A. Shepherd (Stockton); 2, N. R. Gibson (Huddersfield); 3, Mr. Duncanson (Priory). Siamese Fighters: 1, Miss J. Simpson (Peterlee); 2, G. Monk (Aireborough); 3, J. Baxter (Tadcaster). A.O.V. Annabandit: 1, A. Rowbotham (Hartlepool); 2, N. R. Gibson (Huddersfield); 3, K. Dodd (B. Auckland). Dwarf Cichlids: 1, J. A. Whitley (Aireborough); 2, N. R. Gibson (Huddersfield); 3, D. W. Smith (Tadcaster). Large Cichlids: 1, W. Bowman (Stockton); 2, G. T. Liddle (Peterlee); 3, A. Turner (York). Angels: 1, J. A. Whitley (Aireborough); 2, G. Scarth (Cleveland). Corydoras: 1, R. Robinson (Privateers); 2, D. W. Smith (Tadcaster); 3, L. Winwood (Peterlee). A.O.V. Catfish: 1, A. Rowbotham (Hartlepool); 2, J. Avery (Cleveland); 3, Mr. and Mrs. Atwell (Peterlee). E.L. Toothcarps: 1, R. M. Faircliff (Tadcaster); 2, L. Greenall (Tadcaster); 3, D. W. Smith (Tadcaster). Breeders—Livebearers: 1, N. R. Gibson (Huddersfield); 2, C. W. Buck (Stockton); 3, E. Turnbull (Hartlepool). Breeders—Egg-layers: 1, Mr. and Mrs. Scarth (Cleveland); 2, F. Sonley (Ind.); 3, L. Greenall (Tadcaster). Pairs—Livebearers: 1, N. R. Gibson (Huddersfield); 2 and 3, R. Robinson (Privateers). Pairs—Egg-layers: 1, R. Robinson (Privateers); 2, J. A. Whitley (Aireborough); 3, Mr. and Mrs. Clemens (Stockton). A.O.V. Tropical: 1, F. Sonley (Ind.); 2, A. Rowbotham (Hartlepool); 3, A. B. Whitlock (Tadcaster). Furnished Jars: 1 and 2, Mr. and Mrs. G. Scarth (Cleveland); 3, Mrs. D. Handman (Cleveland). Twin Tailed Goldfish: 1, T. Liddle (Peterlee); 2, A. Trotter (Cleveland). Single Tail Goldfish: E. Thompson (Cleveland). A.O.V. Gold Water: 1 and 2, A. Trotter (Cleveland).

**AT** the first October meeting of **Swillington A.S.** a discussion was held on problems frequently experienced by new fishkeepers, and illustrated by several examples taken from the aquatic magazines' problem columns. The entertainment at the second October meeting was provided by G. Birks, who gave a talk on setting up a furnished tank, at Swillington's Home Furnished Aquaria competition is to be held shortly.

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AT the monthly meeting of the Bristol A.S. the guest speaker was Mrs. Norma Craddock, the wife of a former member. Her oration as an aquarist's wife, sharing both her home and husband with the hobby, gave way to one of the most entertaining and amusing periods in the Society's year.

The Table Show results were as follows: Tropical, A.O.V. Livebearers except Guppies: 1 and 2, Miss H. Morgan. A.O.V. Goldfish not previously shown: 1, B. Wilson. The chairman for the meeting, Vice-President F. Brown, voiced his disapproval at the poor entries and pointed out that it was up to each and everyone to see that this did not occur again in the future.

There followed a discussion on the type of social evening the members would most like and it was left to Committee to arrange a suitable venue. Later in the month three members of the Society travelled to Manchester to erect a stand on behalf of their fellow hobbyists in Bristol at the B.A.F. Their intention in doing this was not generally known to the Society until a very late date and to it was very much an individual effort by President H. T. Jago, Vice-President J. Brown and Secretary E. Wilson. Messrs. Stone, Howe and Phillips, who visited the exhibition and assisted in taking the Society's stand down, truly realise the task and work involved that the officers had undertaken. Mr. Jago did have a measure of success having won an award for the highest number of points secured by an exhibitor.

THE proprietor of Cheltenham Aquatics, Mr. Barry James, was the guest speaker at the October meeting of the Haslehead A.S., and addressed members on the theme "Tropical Catfish". Mr. James displayed his obvious knowledge of the subject and impressed his audience with the degree of preparation he had made for the talk.

Speakers already booked for the 1970 season of meetings include Roy Skipper (Proprietor, House of Fishes), A. G. Jessop (Chairman, Federation of British Aquatic Societies), G. H. Jennings (former Director, International Marine Study Society), Dr. Neville Carrington (Managing Director, Inter-Pet), Gwyn Ellis (National Museum of Wales) and G. E. Williams (Deputy Curator and Zoologist, Horniman Museum, London).

Meetings are held on the third Tuesday of each month at the Gabelia Junior School, Colwell Road, Cardiff, at 7.30 p.m. Visitors and new members are always welcome and further details are obtainable from M. J. Parry, 57, Caerw Court Road, Cardiff.

THE October issue of the Coventry Pool and A.S. Newsletter maintains its usual lively standard, with a variety of club news, results, hints and articles. The committee are already making arrangements regarding next year's open show.

EARLY in October the North Kent Inter-Club Show was held and over 100 fish were entered. Two films were thoroughly enjoyed by all present, while waiting for the results of the show. Future events are—2nd December, Mr. Pyle, Lecture on Plants; Table Shows: Fishes, 16th December, Mr. Hunter, Lecture on Anabantids; Table Shows: Swords.

The show results were as follows: Anabantids: 1, J. Stephens (N. Kent); 2, Mr. Clark (Medway); 3, R. Baker (Tonbridge); 4, C. Hunter (N. Kent). Barb: 1, Mr. Marshall (Medway); 2, Mr. Home (Blackwater); 3, C. Wood (N. Kent); 4, Mr. Jones (Erith). Guppy: 1, G. Scott (Erith); 2, J. Bellingham (Tonbridge); 3, R. Bird (N. Kent); 4, P. Ayng (N. Kent). Catfish: 1, G. Rolfe (Erith); 2, J. Bellingham (Tonbridge); 3, B. Bloss (N. Kent); 4, Mr. Matheson (Tonbridge). Sword: 1, C. Wood (N. Kent); 2, J. Stephens (N. Kent); 3, F. Squares (Erith); 4, B. Harvey (N. Kent). Livebearers: 1, J. Parker (N. Kent); 2, J. Stephens (N. Kent); 3, Mrs. Bellingham (Tonbridge); 4, A. Sier (N. Kent). Final Club Positions: 1, North Kent (28 pts.); 2, Tonbridge and Erith (11 pts.); 3, Medway (7 pts.); 4, Blackwater (3 pts.); 5, Sittingbourne (0 pts.).

THE Leigh A.S. had a very successful weekend at the British Aquarist Festival. This was their first attempt at Belle Vue and they took fourth prize for their stand. They also won with their show fish, R. Rawlinson taking first prize for the best Labyrinth in show with a pair of gouramis. H. Moyle with a pair of Anguis was second in this class and J. Dandy also took a second with a pair of Cichlids.

Marine fish was the subject of a very interesting lecture and slide show by B. Pengilly. It was an informative and enjoyable lecture and was received with much interest by all present.

Forty-nine fish were on show and in the Livebearers class the first award went to H. Greenall, second being D. Ridyard and third B. Thompson. Egg-layers class: 1, B. White, 2, D. Ridyard; 3, E. White. Novice class: 1, S. Weldon; 2 and 3, D. Spivey. Best in show was awarded to H. Greenall.

FOLLOWING the Brent A.S. successful away visit in a match with Harrow Aquatic Society, the return match was eagerly awaited and well attended, the results being as follows: Medals: 1, 2 and 3, T. D. Smith (Brent); 4, K. Lee (Brent). Swords: 1, P. Shrimpton (Brent); 2, P. E. Chandler (Harrow); 3 and 4, R. Tebbutt (Harrow). Labyrinth: 1, 3 and 4, P. Shrimpton (Brent); 2, J. Parker (Harrow). Egg-laying Tooth Carps: 1, T. Butler (Brent); 2, P. Shrimpton (Brent); 3 and 4, R. Fox (Brent). The award for the Best Fish in the Show was made to T. D. Smith, and the final competition results were Brent 41 points, Harrow 9 points.

Brent were hosts in the final round of the North West London Sixth Cup Competition. It was extremely well supported, and Judge Mr. Baker commented on the extremely high standard of fish. Over 120 people attended. The results were as follows: Breeders (Egg-layers): 1, D. Allison (Hendon); 2, T. Beaumont (Independent); 3, T. D. Smith (Brent); 4, A. Scudder (Independent). Breeders (Livebearers): 1, B. Mason (Independent); 2, T. D. Smith (Brent); 3, R. Camden (Hampstead); 4, R. Maynard (Hendon). A.V. Medals: 1 and 3, T. D. Smith (Brent); 2, S. Tarrant (Hendon); 4, K. Tuck (Independent). Cold Water Breeders: 1, 3 and 4, A. Sumon (Hendon); 2, J. Brown (Brent).

The award for the Best Fish in Show was made to T. D. Smith of Brent, the final score being Brent 32, Hendon 32. Independent 22, Hampstead 9. The competition was supported by an excellent lecture by Mr. Bert Senior who discussed fishes under his care at the London Zoological Society, and answered thoroughly questions from the floor on all aspects of the hobby.

The Society have formulated an extremely interesting programme for the coming year and membership is increasing appreciably at every meeting. It is one of the few Societies meeting weekly anyone wishing to join can be assured of a very warm welcome. They are invited to contact the Secretary, H. Fox, 22, Harvest Road, N.W.6, when full details of the Club's activities will be made immediately available.

THE Horsforth A.S. Bulletin contains the announcement of the resignation of Mr. Hampson as Editor. The new occupant of the editorial chair is Mr. Dennis Corra.

OWING to fog the guest speaker was unable to attend at the October meeting of the New Forest A.S., but a reserve Quiz programme was put on by D. Harding. This was one of the most enjoyable the club has had and was much appreciated. The prize cards for the Triangular Match with Bournemouth and Salisbury clubs were given out and at present the Club is tied at the end of the first round. The arrangements for the inter-club meetings with Winchester and the second leg of the triangular match were finalised.

The results of the Table Shows were as follows: Breeder's Trophy: 1, Paul Davis, C. Knapp; 2, Guppy, K. Moseley; 3, Patey, D. Harding; 4, Shubert Barb, C. Knapp. Shubunkin (London): 1 and 2, D. Lane; 3 and 4, L. Menhennet. Shubunkin (Bristol): 1 and 3, L. Menhennet; 2 and 4, A. Williamson.

#### NEW SOCIETIES

THE Whitley A.S. has recently been formed; meetings are held in the Black Horse Inn, Monkswaton, on the first and third Thursdays of the month. Anyone interested should contact the Secretary, H. W. Jones, 5, Chestnut Ave., Whitley Bay, Northumberland, and can be assured of a warm welcome.

A NEW Society has been formed in Leeds and is known as The South Leeds A.S.

Meetings are held on the first and third Wednesdays of each month in the Cockburn High School, Burton Road, Leeds, 11. All enquiries should be made to the Secretary, T. Holdsworth, 49, Greenshops Hill, Leeds, 13.

THE newly formed Harrogate and District A.S. next meetings will be held on the 9th of December, and the 13th of January, at Church House, 19 Victoria Avenue, Harrogate, all will be welcome. Time 7.30 p.m. The secretary is A. P. Stothard, 5 Regent Ave., Harrogate.

#### CHANGES OF VENUE

THE new meeting place of the Chingford and District A.S. is Room No. 2, Waltham Forest Recreational Centre, 156, Chingford Mount Road, E.4 (ex-Territorial Army Drill Hall).

Gloucester A.S. Commencing Thursday, the 6th November, the new meeting place is St. James Parish Hall, Upon Street, Gloucester. The revised meeting day is now the first Thursday in the month.

#### SECRETARY CHANGES

Bury and District A.S.: H. Cooper, 7, Balmoral Close, Holcombe Brook, Tottington, Lancashire.

Colwyn Bay and District A.S.: R. P. Evans, 16, College Avenue, Rhos-on-Sea, Colwyn Bay. Privateers A.S.: M. R. Conley, 41, Nub Wood, Crescott, Shipley, Yorkshire. Chingford and District A.S.: L. Hall, 41, Richmond Crescent, London, E.4. Rochampton A.S.: A. Morgan, 9, Sandy Lane, Hampton Wick, Kingston-on-Thames, Surrey. Priory A.S.: M. Atkinson, 89, Millview Drive, Tynemouth.

#### AQUARIST CALENDAR

22nd February: Rotherham and District A.S. Open Show at Drill Hall, Firwilliam Road, Rotherham. Schedules are obtainable from C. Raybould, 52, Dovecourt Road, Rotherham, Yorks.

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

18th April: Thurrock A.S. Third Open Show. Full details later.

3rd May: Bury and District A.S. Open Show. 16th May: Southend, Leigh and District A.S. Provisional date only.

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

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

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

18th July: Barnsley Tropical Fish Society. Open Show. Venue to follow.

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THE AQUARIST