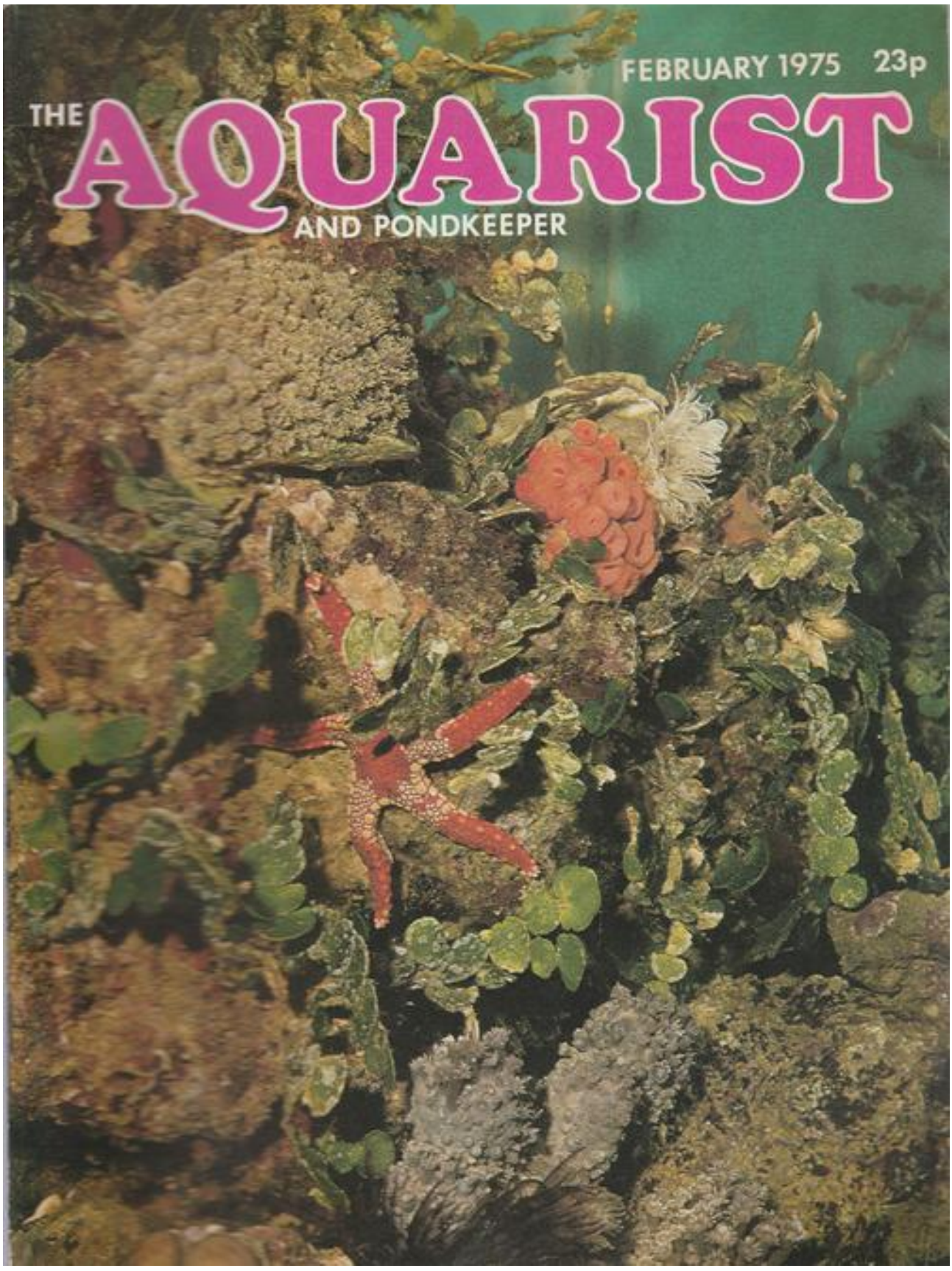

FEBRUARY 1975 23p
THE AQUARIST
AND PONDKEEPER

THE AQUARIST AND PONDKEEPER

The Aquatic Magazine with the Largest Circulation in Great Britain

*Published Monthly 23p*

Printed by Buckley Press,
The Butts, Half Acre,
Brentford, Middlesex.
Telephone: 01-568 8441

Subscription Rates:
The Aquarist will be sent post free for one year to any address for £3·75. Half-yearly £1·88.

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

Founded 1924
as "The Amateur Aquarist"
Vol. XXXIX No. 11, 1975

Editor: Laurence E. Perkins
Advertisement Manager:
J. E. Young

ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

Our Cover:

Colourful Marine set-up by courtesy of Tropical Marine Centre Ltd.

# Contents


| | Page |
|---|---|
| Scale-eaters and Fin-biters | 414 |
| *Amphiprion clarkii* | 416 |
| What is Your Opinion? | 418 |
| Our Readers Write | 423 |
| News Items | 424 |
| Product Review | 426 |
| From a Naturalist's Notebook | 428 |
| Marine Queries | 430 |
| *Girardinus metallicus* | 432 |
| Classification of Fishes | 433 |
| Travel News | 437 |
| Our Experts Answer: Tropical Queries | 438 |
| Coldwater Queries | 439 |
| *Synodontis* Catfish | 442 |
| Viewpoint | 444 |
| For the Herpetologist's Bookshelf | 446 |

*Plecodus straeleni*

# SCALE-EATERS & FIN-BITERS OF THE EAST AFRICAN LAKES

*Written & Illustrated*

*by Dr. Wolfgang Staeck*

ALTHOUGH cichlid fishes live in Africa, America and Asia, the centre of their distribution is East Africa, for more than 500 of the approximately 700 known species can be found in the Lakes of the Great Rift Valley. But more striking than the great number of species is the diversity of the ways of life among the East African cichlids. Whereas these fishes generally possess rather uniform ways of life and feeding, there are many examples of extreme specialisations among the cichlids of the East African Lakes. Similar to the famous Darwin Finches of Galapagos (which have conquered by special adaptations to different environ-

mental conditions almost all the biotops of their habitat), the East African cichlid fishes have deployed themselves by intense specialisation in the various ecological niches available in the lakes.

Some of them are strictly confined to rocky shores, others to sandy shores, meadows of *vallisneria*, the open water or great depth. A further differentiation is given by the adaptation to different ways of feeding. Among the cichlids of the East African lakes are piscivorous and insectivorous species, phyto- and zooplankton feeders, leaf-choppers, mollusc-feeders, fin-biters and scale-eaters.

With regard to the different feeding habits, the eating of scales is the most interesting specialisation. In Lake Victoria this source of food has been exploited only by a single species, *Haplochromis welcommei* GREEWOOD, 1965. In Lake Malawi there are at least three scale-eating species belonging to two different genera. Of them only single individuals of *Genyochromis mento* TREWAVAS, 1935 have been imported now and then. As these fishes show a remarkable resemblance to *Pseudotropheus zebra*, they frequently were mistaken for this species. A closer examination shows, however, that the body of the scale-eater is more elongated. A further distinctive feature is the very rigid and prominent lower jaw which is armed with six rows of sharp teeth.

The similarity of this species to *P. zebra* is not limited to the body form but extends to the coloration, too. Among the imported fishes there were, besides dark blue and blue-grey specimens, a number of individuals the body of which was either pure orange or marked by blotches of black and orange pigment spots. The colour pattern of those fishes looked exactly like that of certain colour morphs of *P. zebra*.

The examination of the gut of *Genyochromis mento* proved that they feed almost without exception on scales which are scraped from other fish. The favoured victim is *Labeo cylindricus*, a slender and elongated cyprinid fish. During the process of digestion the scales are reduced to a structureless pulp. There are indications that in this species scales are not the only source of food, for occasionally fragments of *algae* and parts of fins have been found in the gut.

Unfortunately, it is impossible to keep *G. mento* in a community tank, as in captivity this fish bites pieces from the fins of other fish in order to eat them. As in an aquarium there is no chance for the victims of avoiding the attacks, they may be completely deprived of their fins within a few hours. The interesting question: how far *G. mento* spares members of its own species has not been analysed. As this species is closely related to the genus *Pseudotropheus*, its peculiar way of feeding has to be interpreted as a curious deviation from the habit of rasping *algae* from the surfaces of rocks.

The other two scale-eating fishes of Lake Malawi are two species of *Corematodus*. The way of living of *C. shiranus* BOULENGER, 1896 has been examined in detail. This species is comparatively rare. It lives in small numbers among the shoals of *Tilapia*, which form its main source of food, as it rasps from those fishes the minute scales which clothe their caudal fins. Like the *Tilapia*, *C. shiranus* shows a pattern of a series of well-marked dark crossbars on a silver-grey ground colour. Only breeding males develop a blue and golden dress. In addition even the size of this scale-eater, which attains a length of nearly 30 cm, is comparable with that if its victim. In consequence of this similarity in colour and size, *C. shiranus* can advance on the shoals of its victims unnoticed.

The second member of the genus, *Corematodus taeniatus* TREWAVAS, 1935 is less well known. The largest recorded length of it is 17 cm. This silvery-grey cichlid shows a dark oblique band running from the nape to the base of the caudal. This scale-eater feeds on the scales of a number of cichlids from the genus *Haplochromis* which show a similar colour pattern. The fact that there are scale-eaters in *Genyochromis* as well as in *Corematodus*, which by no means are particularly closely related genera, indicates that this habit of collecting food has been evolved independently twice in Lake Malawi.

The greatest wealth of scale-eaters exists in Lake Tanganyika. Up to now no fewer than five different species have been counted, which belong to two closely related genera. One of them is monotypic. *Perissodus microlepis* BOULENGER, 1898 is its only member. This beautiful cichlid, which shows a pattern of blue spots and yellow stripes, attains a length of about 11 cm. The rest of the scale-eating cichlids of Lake Tanganyika belong to the endemic genus *Plecodus*. Unlike the scale-eaters of Lake Malawi, which possess a great number of small teeth, they have only a single series of 15 to 30 remarkably recurved teeth in both upper and lower jaw. *Plecodus elaviae* POLL, 1949, *P. multidentatus* POLL, 1952, and *P. paradoxus* BOULENGER, 1898 have the same body form as *Perissodus microlepis*. They are slender and elongated fishes. A common feature of these species are the thick lips and the strongly developed lower jaw. *P. multidentatus* grows to about 11 cm in size, *P. paradoxus* attains a length of 25, *P. elaviae* even of 32 cm.

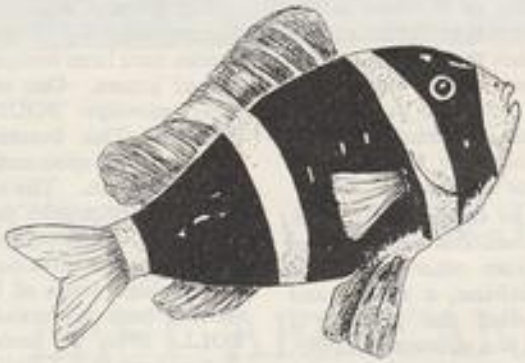
The fourth member of this genus, *Plecodus straeleni*, has a rather aberrant shape. It grows to about 15 cm and is very deep-bodied and compressed from side to side. On a silvery-grey ground colour it shows a pattern of five dark brown vertical stripes between the margin of the operculum and the base of the caudal fin. Three or four similar stripes run over the snout and the nape. The sides may shine in a bluish cast. The dorsal, the anal and the caudal fin show pale yellow and

*Continued on page 417*

# *Amphiprion clarkii*

by H. G. B. & Q. G. B. Gilpin

SOMETIMES CALLED the yellow-tailed anemone fish, *Amphiprion clarkii* is a strikingly handsome and colourful fish, well suited to life in an aquarium. Basically its body is a dark, blackish-brown, transversed by three bluish-white bands, one at the root of the tail, one behind the eyes and one halfway between. In immature fish, the middle band passes across the body and right through the dorsal fin to its top edge, but in adults it does not reach the upper margin of the fin.



The tail and pectoral fins are yellow, whilst the other fins vary to some extent, commonly being a uniform black. There is variation too in the shade and intensity of the yellow. This was shown clearly by our pair of these fish. One had a pale, brownish-cream face whilst that of the other was a warm orange. The orange hue became intensified in the case of the latter when it was emotionally disturbed, whilst the colour of the former remained constant at all times.

Both our fish were four inches in overall length on arrival, suggesting they were almost fully grown. Two rows of small, spiked teeth were clearly visible when the fish opened their mouths. We kept them in a moderate-sized marine aquarium, bedded with coral sand and a number of rocks, equipped with an undergravel filter and maintained at 70°F.

Interest in the aquarium was increased by the presence of two fairly large tealia anemones, each with a column approximately three inches long by two inches across, topped by moderately long, slender white tentacles, suffused with a pale, pinkish-mauve tint. The bases of the columns, seen when the animals attached themselves to the glass front of the aquarium, were bright orange.

When first introduced to the aquarium the fish completely ignored the anemones but this disinterest was of very short duration. By the end of a week both fish were constantly approaching the anemones, ecstatically rubbing themselves among the tentacles. Soon they treated the anemones as sanctuaries in times of trouble and hastened to bury themselves amongst the stinging tentacles when disturbed or frightened.

As a general rule each fish confined its attentions to one anemone. The lighter, more orange-coloured fish, apparently the more dominant member of the pair, sometimes entered its partner's anemone but the darker fish remained permanently faithful to the one it had adopted as its own and ignored the other.

A curious behaviour pattern developed during feeding times. If one of the fish was given a piece of prawn, too large to be swallowed easily, it carried the

morsel to its anemone and deposited it on the tentacles. Frequently it returned to the anemone before the food had reached its "mouth" parts, removed the food and replaced it on the tips of the tentacles. Often the fish finally removed the food and ate it but occasionally the anemone managed to pass it into its coelenteron and so derive some benefit from the exercise.

In order to make sure the anemone received sufficient nourishment, it became necessary to distract the fishes' attention when it was being fed by giving them an ample supply of easily swallowed food in the open parts of the aquarium, so that the anemone had enough time to absorb a meal before a fish removed it.

Neither fish was ever seen to "park" food on an anemone if the pieces were small enough to be swallowed whole.

According to the literature, *A. clarkii* tends to become aggressive as it reaches maturity. This has been borne out by our own experience. We soon found that these anemone fish have no place in a community aquarium. They are definitely pugnacious and unsafe companions, even for fish comparable in size to themselves.

Although satisfied that the yellow-tails were unsocial towards other species, we decided, after watching their behaviour for several days, that they were harmless towards each other. This proved to be the case at the time and for a considerable period they lived together without the slightest disagreement. And then disaster struck. After peaceful cohabitation for nine months, the lighter-coloured fish suddenly set about the other, not actually biting it, but charging forward with open jaws and hammering it about the body. Unfortunately a rapid rescue failed to save its life. The dead fish showed no signs of injury, presumably the battering it received caused internal damage.

Apart from its inability to mix with other fish, these anemone fish are easy to keep in aquaria. They are hardy and feed freely on misa shrimps, frozen prawn, adult frozen brine shrimps, chopped earthworms and prawn eggs. Occasionally offerings of a marine dried food will be accepted.

Common in their native habitat, they are widely distributed over the whole tropical Pacific waters and the Indian Ocean. They rarely move more than a few feet from their own individual anemones to whose poison they become immune. This immunity does not extend to the stinging tentacles of other anemones and a fish seeking protection amongst the tentacles of any anemone, other than its own, is liable to receive a shock.

# SCALE-EATERS & FIN-BITERS *(continued from page 415)*

blue shades. The pattern of dark bands may disappear in adult individuals. Like the other members of *Plecodus* this fish possesses unusually large teeth, which, however, generally cannot be observed in the live animal. They become only visible when the mouth with its protractile lips is opened.

Marlier and Leleup, who studied *P. paradoxus* and *P. straeleni* in an aquarium, succeeded in feeding *P. paradoxus* on small pieces of earth-worms after some difficulties. *P. straeleni*, however, would not accept this or any other substitutionary food. This seems to indicate that this species is extremely specialised in the eating of scales.

In contrast to these authors my studies of an indiviual of *P. straeleni* led to different results. From the different kinds of food which were offered to the fish for selection, it accepted at once chironomid *larvae*. Later on it fed on small *crustaceae*, too.

Nevertheless this cichlid is on no account a suitable fish for a community aquarium, for it does not give up eating scales in captivity. The attack on another fish is very fast. It presses its mouth against the side or the back of the victim and closes it. As a result the attacked spot is completely deprived of its skin and its scales. When Poll examined the gut of this species, he found that the eaten scales pass down the alimentary canal like a pile of plates. At the end of the process of digestion they are reduced to a structureless mass.

As there has been no information about the breeding behaviour of the different members of the genus *Plecodus*, it may be an interesting task to try to breed these species in an aquarium. If kept as single individuals or in pairs, all the above-mentioned scale-eaters are attractive fishes, the study of which promises very interesting observations.

References:

G. Fryer, "The Trophic Interrelationships and Ecology of Some Littoral Communities of Lake Nyasa with Especial Reference to the Fishes, and a Discussion of the Evolution of a Group of Rock-Frequenting Cichlidae," *Proc, Zool. Soc. London*, 132 (1959), 153-281.

G. Marlier and N. Leleup, "A Curious Ecological 'Niche' among the Fishes of Lake Tanganyika," *Nature*, 174 (1954), 935-36.

M. Poll, "Poissons Cichlidae," *Result. scient. Explor. hydrobiol. lac Tanganika* (1946-1947), vol. III, fasc. 5B, 1-619 (Bruxelles, 1956).

E. Trewavas, "An Example of Mimicry in Fishes," *Nature*, 160 (1947), 120.

# WHAT IS YOUR OPINION?

## by B. Whiteside, B.A.

*Photographs by the Author*

OUR OPENING letter this month comes from Mr. A. Vickery, of 1 Le Brun Road, Eastbourne, Sussex. He writes: "Recently I had the misfortune to lose all of the fishes in my 48 in. tank, due to the failure of two heaters while I was on holiday; and so I decided to buy a pair of oscars to put in the tank." (See photograph 1.) "They settled in very quickly and were soon accepting any food given to them. Their basic diet is trout pellets, obtained from a local aquarium shop, supplemented with earthworms, cooked peas, dog meat and flake food. They will never refuse food and grow at a steady rate; occasionally they lie on the gravel, on their sides, to recover when they have gorged themselves! The tank has been maintained for two years with only two Algarde U/G filters. Every month I top up the water and cut back the plants which grow very fast under the tungsten lighting. For those who enjoy keeping very large fishes I can certainly recommend oscars as they are very colourful and have a marked personality. Three kinds of gouramies have spawned in my tanks: opaline, pearl and thick-lipped. The thick-lipped gouramies ate their eggs; and those of the pearl gourami became infected with fungus. However, I managed to raise fry from several spawnings of opaline gouramies, the greatest number being 80 from one spawning. The last time the opalines spawned no nest was built, the fish spawning within hours of being put in a tank on their own. The parents were fed on *Tubifex* and flake food, but were kept in the same tank prior to being moved to the spawning tank. Nearly all of the eggs hatched, the losses occurring about a week after hatching, during the period when the labyrinths were developing. During this period it is very important to ensure that no scum forms on the water surface as this chokes the fry.

"I find snails very useful in breeding tanks, if introduced after the fry have hatched, as they keep down the whitish *algae* (fungus?) that develops when infusoria are introduced. As a second food for egg layer fry I can thoroughly recommend TetraMin E food for egg layers. The size of the particles is the best I have found—certainly smaller than those of Biol, which I use later. Another cause of losses in *Anabantid* fry is the failure to develop the swim bladder in a small—and sometimes large—proportion of the baby fish. The result is that these fish find it hard to reach the surface for food and air; and so they perish. I can find no apparent reason for the differing sizes of this non-swim bladdered proportion of the fry. As I have used different parents it could be that it is a genetic factor; but I think that this is unlikely. Any suggestions anybody? 'W.Y.O.?' is by far the best information service available to aquarists like myself—even if one does not always agree with all that's said."

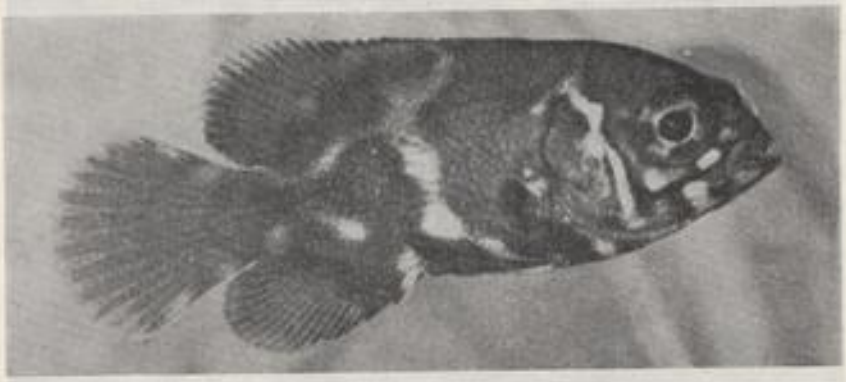
Mr. D. Moore, who resides at 2 St. John's Road, Newquay, Cornwall, writes about golden gouramies. "Earlier last year I purchased a 3½ in. pair of golden gouramies and, having a spare 18 in. × 12in. × 12 in. tank, I decided to try to breed them. I placed the female in the tank, which was filled with old tap water, and covered the base with gravel. The only plant used was *Cabomba*, which was planted in the gravel, and Indian fern which was allowed to float on the surface. The water temperature was a steady 78°F. The female was conditioned for a week on a variety of flake foods and white worms. Prior to the introduction of the male the female was placed in a floating breeding trap. When the male was introduced he showed a lot of interest in her. After about half an hour he settled down and started blowing bubbles in different parts of the tank. Unfortunately I had to go out then; and when I returned, approximately two hours later, there was a bubble nest, about 2 in. across, under the lip of the breeding trap. The female was out of the breeding trap and was in the process of spawning with the male. Having no cover on the breeding trap had allowed the female to jump out while I was absent. After three quarters of an hour of spawning I removed her to my cichlid community tank. I then completely covered the breeding tank with a sheet of polythene.

"The male tended the nest for two days; the fry hatched and he continued tending them for a further two days—after which the fry were free swimming. I then removed the male to the same community tank as the female. The fry, which were fed on Liquifry No. 1 for egg layers, seemed to number thousands. Having no spare tank to thin them out in as they grew, only 25 survived. Only a week after the parents were placed in the cichlid community tank they spawned

again. The male turned very aggressive towards the four firemouths in the tank; and also against any fingers which were placed in the tank. I have now separated the adults into two tanks."

Mr. D. Grayling's home is at 8 Goulton Road, Clapton, London, and he writes: "I breed white worms in a plastic bowl filled with earth and covered with a piece of expanded polystyrene. I feed the worms on wholemeal bread—half a slice laid on the surface. If it starts to go mouldy I cover it with earth."

Layman-Dixon Farms and Stud, Lower House, Felindre, Knighton, Radnorshire, Wales, is the address of Mr. A. G. Lyman-Dixon. He writes: "Last month (November 1974) I bought my first copy of *The Aquarist* since 1959. Haven't things changed! The fish even like dried food now. So it was last month, for the first time in about 15 years, that I switched on my old Scot air pump; it started first time and is blowing bubbles like new. I purchased the



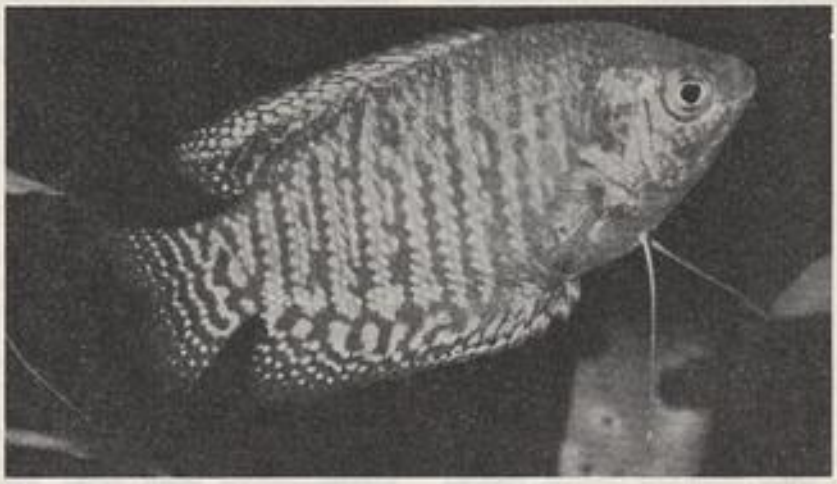
pump on the recommendation of *The Aquarist* in 1952." (Mr. Lyman-Dixon enclosed an interesting photo-copy of a letter, dated 11th October, 1952, he received from this magazine. It was a reply to several of his queries and, amongst other things, recommended the Scot air pump. A point of interest: my first air pump was also a Scot. It will still operate although I no longer use it as it is now rather noisy). Mr. Lyman-Dixon continues: "I have always wanted to breed Jack Dempseys, but when I last kept fish Cichlids were comparatively hard to come by. However, on my last visit to Shrewsbury there were Dempseys and all manner of other excitements in the shops; and so I bought a number of fish with fairly horrible reputations to plonk into a 36 in. tank in the hope that by the time my ancient tanks were reglazed these tiny fish would be of sufficient size to move into new quarters to grow on to breeding size. I was wrong; I had not taken into account that now we are living on a farm with its own supply of spring water from the taps, and *Gammarus* in the streams. Behind the barn is a pond that years ago was turned into a muck heap. As part of normal agricultural policy we spread muck when we arrived here from Hampshire—where the tap water consists of chlorine, with a few odd drops of water thrown in to keep it fluid—and the site gradually reverted to marsh, and then pond. Now it contains *Daphnia*, blood worms and *Tubifex*. Green water, which is seen to be seething under the microscope, comes from a noisome, concrete sump in the chicken house. On this diet the fish grew and grew at a staggering speed—with the exception of guppies, of course, which were added to the diet unintentionally. Incidentally, as all you aquarists scrape your fresh meat for your ravenous angels, etc., spare a thought for the bloke who made it possible; guppies were selling for more than calves in Shrewsbury last month!

"Chucking *Daphnia* straight into a tank, from the ex-dung heap, makes it filthy—but you should see the Amazon sword plants which I thought were supposed to be difficult. I got a couple from my old friends, Tachbrook Tropicals, last month; they had no runners—nothing much except roots and leaves. Now we have ten lustily growing Amazon swords and two new runners complete with healthy shoots. They beat guppies any day! But the *Vallisneria*; oh dear! Why can I never grow the wretched stuff? It gets 'the death' as soon as I stick it in the gravel—and it is the only plant I religiously try to root at the correct depth, etc." (I suggest that you give up trying to grow *Vallisneria*. It's one of the few plants I just cannot get to thrive in a tropical aquarium—although I have had it thrive in cold water tanks. I suspect that *some* of the authors who recommend the plant for tropical aquaria do so because they have not grown it but because they have seen it recommended by earlier authors in earlier books. Other reasons for its being recommended frequently are that it is so commonly available and that it has been mentioned in connection with aquaria since 1850. Hervey & Hems, in their latest book *A Guide to Freshwater Aquarium Fishes* (Hamlyn), state that in 1850 Robert Warrington told

the Chemical Society how he had managed to keep fish for long periods without having to change the water, provided that growing *V. spiralis* were present. I was interested to note that the fish Warrington kept were goldfish! In their excellent book Hervey & Hems point out that *V. spiralis* will not thrive in water that is very soft. No doubt many aquarists can grow this plant in tropical tanks. I'd be pleased to hear of the conditions under which they manage to get the plant to flourish. Send letters to me c/o *The Aquarist*.) Mr. Lyman-Dixon continues: "In my 36 in. tank I put a 100 watt bulb at each end. I have one on a.m. and the other p.m.; both are off from midnight until 9 a.m. This keeps the plants, with the exception of *Vallisneria*, happy, and leaves a dark area for the fish which do not like excessive light." (An interesting idea!)

Mr. G. Rowsell lives at 7 Charleston Close, Hayling Island, Hants. He started keeping fishes only recently and writes: "Creating a good environment and achieving a balanced aquarium has been my main concern during my fist few months of cold water fishkeeping, and lighting has caused me some initial problems. So far I have just one 24 in. × 12 in. × 15 in. tank and to start with was advised to install a 21 in. × 13 watt Gro-Lux tube. The man in the shop said it would enhance the colours of the fishes and make the plants grow well. I would not argue with the former statement, but my plants—in particular, *Sagittaria*, *Ludwigia* and *Eichhornia*—soon began to develop a covering of brown *algae*. This I took to be a sign of insufficient light, and so I increased the duration of the supply from 10 to 14 hours daily—but without improvement. Realising that it must be insufficient wattage I perused advertisements for Gro-Lux tubes and discovered that whilst the wattage increased per length of tube all the way up the range, the 21 in. tube was the exception because its wattage was actually lower than an 18 in. tube, i.e., 12 in.-8 watts; 18 in.-15 watts; 21 in.-13 watts; 24 in.-20 watts; 36 in.-30 watts; 48 in.-40 watts. This seems an incredible situation and by any natural progression 18 watts would appear to be required for the 21 in. tube. Anyway, realising that the 24 in. tube would not fit inside my cover, and that they tended to be costly, I made further enquiries and soon discovered a considerable anti-Gro-Lux feeling. Mr. Leslie B. Katterns, who lives near me, said he knew of many aquarists who had become disillusioned with Gro-Lux and advised ordinary bulbs. So did Hobby-Fish, from whom I purchased some new plants. They did not recommend Gro-Lux lighting as only plants requiring low light levels appeared to thrive under it.

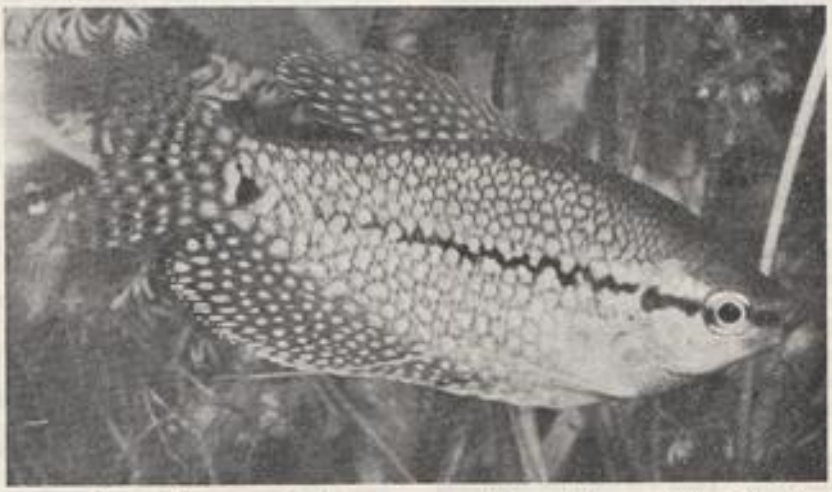
"Accordingly I changed a few weeks ago to two ordinary bulbs totalling 40 watts for 10 hours per day.



So far the results have been most encouraging, with the brown *algae* diminishing rapidly and new healthy growth showing even at this time of year. The water is looking crystal clear so I hope I have now got the problem solved. I believe the formula for working out wattage necessary is to multiply the tank length by 3½, which gives me 39—say 40 watts; but I understand that half this is considered adequate for a fluorescent or Gro-Lux tube—say 20 watts. The Gro-Lux 13 watts is still obviously too little, though. It is interesting to note that Hobby-Fish recommend 40 watts per square foot, i.e., 80 watts for my tank. Too much surely? Good luck to you and your excellent feature. I shall be interested in and grateful for any advice arising out of my letter." (It's difficult to be dogmatic about aquarium lighting as there are usually so many variables, e.g., depth of tank; amount of natural light it receives; season of the year; species of plants growing in the tank; number of plants in the tank; species of

fishes kept; whether or not *algae* are a nuisance; length of time for which artificial lighting is supplied daily. The general rule of tank length in inches multiplied by approximately 32, and divided by the number of hours for which the lights will be on, to give a rough estimate of the wattage of tungsten light required, is a reasonable one with which to begin. Remember that a strong light for a short period is better for plants than a weak light for a long period. My own suggestions for well-planted tanks, using tungsten lighting, are: 18 in. × by 10 in. deep tank-40 watts; 20 in. × 12 in. deep-60 watts; 24 in. × 12 in. deep-two 40 watt bulbs; 30 in. × 15 in. deep-two 60 watt bulbs, etc. My suggestions are based on the lights being on for 10 to 12 hours daily, with tanks sited out of direct sunlight. I find that plants and fishes thrive—with the exception of *Vallisneria spiralis*! However, I live in an area with relatively soft water. If your plants are thriving at present then I suggest that you leave things as they are. No two aquaria are similar and your present aquatic environment may be ideal for the plants you have growing in it. I now use Gro-Lux on only one tank—and there it is used in conjunction with tungsten lighting. I include it only because it brightens the reds and blues of such fishes as neons, cardinals, red swordtails, etc.)

No. 35 Radley Road, Fishponds, Bristol, is the address of Mr. R. Handford. He writes: "In my 40 in. × 15 in. × 12 in. tank I use U/G filtration and Gro-Lux lighting. All of my plants grow very well except *Cabomba*. All the rest have to be thinned every three weeks and distributed to my less fortunate friends. My pair of dwarf gouramies (Photograph 2) has given my family and myself the greatest pleasure. The male is exceptionally well coloured and, much to my surprise, he built a nest in the community tank. The pair spawned and the male protected the nest until all the fry swam away. All of the other fish were driven to the far end of the tank and stayed there while the male had his way. The male started to build another nest in a matter of days, so I set up a 24 in. × 15 in. × 12 in. tank and put the pair in. The water was straight from the tap and at about 85°F. They spawned within days and I removed the female. The male tended the nest and was removed as soon as the fry were free swimming. I fed them on egg yolk and Liquifry. I managed to raise about 45 fish to maturity and still have quite a few in my own tanks. The parent continued to spawn every week for about five weeks. The shortest time between spawnings was six days. Unfortunately the female died soon after this. I recently bought a pair of pearl gouramies, *Trichogaster leeri* (Photograph 3), and they are beautiful fish. The male is magnificent, and although he hasn't built a nest I'm sure he soon will. I also bought four pygmy gouramies, but as two died I'm not sure if those left are a pair or not. They are also beautifully coloured when seen in the right light.



"My red-tailed black shark is the boss in my tank. Although this species is not supposed to be aggressive, mine has caught two of my young gouramies, about ¾ in. long, and killed both. In my pond I have about 40 fish, including three roach. They were caught as fry when I was after *Daphnia* where I work. They are now over 3 in. long. I work on a trout farm at Chew Valley Lake; as you probably know it's a famous trout lake. I also go fishing every weekend. You'll probably realise why everyone says I'm a fish fanatic."

Mr. R. Mathers resides at 29 Hawarden Road, Hope, Nr. Wrexham, Clwyd. He writes: "I have four tanks in which I grow my plants. All four enjoy luxurious plant growth—so much so that my friends have said that my fish have to carry machetes to find their way around? The four tanks have the following

conditions in common. They do not benefit from natural light and therefore the lights are on for 16 hours per day, every day, summer and winter. They are established tanks, set up three years ago when I moved. Water conditions: tap water has total hardness of 60 p.p.m.; tanks run between 80 and 180 p.p.m.; pH around neutral, with only slight variation; temperature 80-84°F. Tank 1 is 30 in. × 15 in. × 12 in. wide; light is from a 20 watt white fluorescent tube; plants—one large Amazon sword that regularly sends out runners, giving rise to many young plants which I have to continually thin out; giant *Hygrophila*—grows well and has to be cut back and thinned out regularly; *Najas*—as above; fishes—harlequins, checker barbs, splash tetras and honey gouramies. This tank does not suffer from *algae*. Tank 2 is 18 in. × 10 in. × 10 in.; light-25 watt tungsten bulb; plants—*Vallisneria spiralis*, 1 Amazon sword and *Najas*; all do exceptionally well and I have to continually thin out; fishes—albino mollies and platies. There are no problems with *algae*. Tank 3 is 36 in. × 15 in. × 10 in. wide; light—20 watt Gro-Lux tube (4 months use only); plants—1 large Amazon sword, 1 unidentified sword and a large number of *Cryptocoryne affinis*; fish—tiger barbs, *Barbus binotatus* and checker barbs. All the *C. affinis* were grown under tungsten bulbs, 180 watt; then 20 watt white fluorescent tube. Under these conditions growth was prolific and there was no *algae* problem. When the white tube blew I replaced it with the 20 watt Gro-Lux tube. Result: the fish, especially the tiger barbs, looked fantastic, but it does not seem to benefit the plants—in fact, the opposite seems to be the case as the *C. affinis* seem to be on the decline; and also, for the first time, this tank has an *algae* problem. When the life of this tube comes to an end it will be replaced with a fluorescent tube other than the Gro-Lux type. Tank 4 is used for spawning barbs and other fish and is lit by a 20 watt white fluorescent tube." Mr. Mathers goes on to say that a wide variety of plants flourish in this tank. He sums up by saying: ". . . I have used various fluorescent tubes, all 2 ft. × 20 watt—namely, white natural, warm white and Gro-Lux, and Gro-Lux is the only one under which the plants do not seem to flourish. Fish seem to do equally well under all these lights. I have not found that fluorescent tubes give different results to tungsten bulbs, but I favour fluorescent for the following reasons—low heat; far fewer breakages due to condensation; more light for same electrical power used, therefore cheaper to run; and probably the most important under my running conditions, twelve to eighteen months of light—as opposed to four to twelve weeks from tungsten bulbs . . ."

The next letter comes from Mr. S. Fox of 126 West Farm Avenue, Longbenton, Newcastle upon Tyne. He says: "Most aquarists would agree that *algae*, when seen in profusion, do not make a pretty picture in the aquarium, yet when seen under the microscope most species of green *algae* are quite beautiful. . . . When the water in an aquarium is not as clear as it should be, aquarists, instead of using clarifying agents, should place in the aquarium the species of duckweed known as *Lemna trisulca*. I have always found this plant to be very useful in keeping the water clear, especially in any aquarium where filtration is not used. Unlike other species of duckweed this one does not grow rapidly or become a nuisance in the aquarium. This plant likes shade: if placed under a plant such as *C. siamensis*, which has broad leaves, it will appear at its best. This species of duckweed is not often seen in the aquarium, which is a pity, for in my opinion this plant is the most attractive species in the genus. Aquarists might care to try the following: instead of using filter wool in filters I recommend the use of *Utricularia gibba*. This bladderwort makes an excellent filter medium; it is practically everlasting and can be taken out of the filter, washed under the tap, and then returned without coming to any harm. The species of *algae* called *Spirogyra* will perform the same duty as a filter medium, with equal effect. These are two useful plants—and they can save money too." (While I agree that bladderwort could be used as a filter medium, I would prefer to keep *Spirogyra*—a type of thread *algae*—completely away from aquaria. Such plants can become a nuisance if they find their way into the aquarium itself.)

In reply to my recent query about the keeping of the powder-blue surgeonfish, *Acanthurus leucosternon*, I received the following reply from B.M.A.A. member Mr. K. Latter, of 11 York Road, Littlehampton, Sussex. "At the time of writing I have a specimen which was purchased on 5th December, 1971, and it is still thriving and eating well. A good, varied diet is fed, i.e., tinned brine shrimps, *Mysis* shrimps, prawn, prawn eggs, spinach and Tetramin flake food. The aquarium also contains a good growth of green *algae* which are also eaten. My specimen refuses all forms of meat, e.g., liver and ox heart. The fishes' tank is 48 in. × 18 in. × 18 in. and is filtered by a home-made U/G filter. 'SeaTrace' and 'SeaGreen' are added each week, and Phillips' Aquavite tablets are added every other day. A 10-gallon water change is made approximately every 12 weeks. One point of interest is that no growth has occurred, the fish remaining at 5¾ in. from purchase to date. I have found my particular specimen easy to feed and maintain although obviously this would vary from specimen to specimen. I think I was fortunate in that I was able to purchase one in first-rate condition at the outset."

The most unexpected Christmas present I received in 1974 was a young discus. It is a most attractive fish, with delightful colours; but one of its pectoral fins was damaged in transit. Unfortunately I did not have

*Continued on page 427*

# OUR READERS WRITE

### Open Shows

Having read Dick Richards' letter in 'Our Readers Write' for Nov. 1974, I would like to put him right as he seems to be under a cloud of misapprehension.

I would like to point out to him that at the time of writing (5 December, '74) the Severnside Aquarists' Association does not, and never has, laid down any rules for Open Shows organised by clubs affiliated to the Association. The S.A.A. believes that all clubs should remain autonomous, making their own club rules and Open Show rules. However, I would like to point out that at the moment we are in the process of drawing up a set of eight or so rules to be observed by affiliated clubs holding Open Shows. The clubs concerned, however, will still be the governing body at their own show.

Dick next states that the F.B.A.S. rightly or wrongly, have tried to get the two sides together. This did actually happen about three years ago but I am afraid that the main reason for this get-together was for the F.B.A.S. to try and persuade all the clubs in the Severnside to join the Federation. The meeting lasted for approximately three hours and at the close of the meeting almost every delegate present—including the few delegates whose clubs were affiliated to both organisations—were rather disgusted at the inflexible approach and attitude of the F.B.A.S. Committee who were given a free rein to hold the meeting including 'taking the chair' at what should have been a normal Severnside meeting.

I myself have communicated with Mr. Tomkins, the Chairman of the F.B.A.S. with regards to mutual recognition of Judges. However, I had a rather serious illness in June from which I have not yet fully recovered, and while I was in the hospital his last letter containing his new address was lost. Not having had any further communication from Mr. Tomkins (whom I should imagine has my address) I am afraid the correspondence between us has come to a stop.

I noticed that the only 'Other' Association named by Mr. Richards is the S.A.A. Other associations have their own show rules and their own ways of running shows which are different to the F.B.A.S. which Mr. Richards club is affiliated to. Are all these other Organisations wrong?

If Dick—who I know, having been one of the judges at his club's first two Open Shows—would let me know to which clubs he is referring—when he says he has been confronted with S.A.A. Judging Rules, I will be pleased to take this matter up for him.

E. G. Newman,
Secretary Judging & Standards Comm.
Severnside Aquarists' Association.
71 Somerdale Avenue,
Knowle,
Bristol BS4 1AE.

### Anyone for Twinning?

The Killingworth Aquarist Association has written to two clubs in the South regarding twinning, as the twinning between South Shields and Baisingstoke seem to be a success, but we have not yet had any replies to date, so we hoped that your magazine may help us in this quest.

We are a new club with about 25 members starting in March 1974. We have showed and been placed at every local Open Show this year. We meet in Killingworth which is a new town and are part of Communicare. We hope to run our first open show in 1975 and would be willing to travel to any Southern Open Show. If any Southern club is interested would they please write to:—Tamerisk, 14 Crumstone Court, Garth 21, Killingworth, Newcastle 12.

C. S. Hickman,
Hon Sec K.A.A.

### Badges Wanted

I wonder if through your column I can ask fellow aquarists if they have a club badge spare they could send me as my son and I are trying to build up a collection of Aquarist Club badges to put in a large frame.

Thank You
M. Sneddon
35 Spurn Walk
Hartlepool
Cleveland
Hartlepool Aquarist Society.

### Avoidable Heartbreaks with Marines

Recently on a visit to Belle Vue Park I decided to pay a visit to the aquaria there. Expecting to see a few small tropical tanks I was greatly surprised and thrilled to see beautiful marine fishes swimming about in what appeared realistic surroundings. Immediately my wife and I set our hearts on a marine tank.

Having decided to establish a Marine aquarium I visited my local aquarist, the Underworld at Loughborough, who advised me to read thoroughly "Tropical Marine Aquaria" by Grahame Cox, advice I have found invaluable.

Approximately one month later I had purchased all the necessary equipment and had set up a tank.

I matured the tank using a *Radianthus* anemone with an oral disc some six inches in diameter. Maturation took exactly twenty-five days. During this period I also added to my system several pieces of living rock, a Boxing shrimp (*Stenopus hispidus*) and two pieces of the *algae, Caulerpa prolifera*, which have grown at an outstanding rate without the use of any fertilising agents. The only aids added to the water are those recommended by the Seaquariums system.

Introducing these presented no problems whatsoever. The Boxing shrimp was missing one claw but swiftly grew another.

One week after the Nitrites had gone, and had remained at zero for one week, I purchased two common clownfish (*Amphiprion percula*).

I took the usual precautions on introducing the fishes and after ninety minutes released them from the bag which they were brought home in. Both fish headed straight for the anemone and started a ritualistic dance in and around it. They sucked the tentacles and shook violently throwing themselves into the swaying mass. However, soon one of the clowns, both of whom had lived in the shop peaceably without an anemone, became very dominant and jealous of its new possession. It bit the other clown on the right side, taking a piece from it, and chased the injured clown from the anemone. The injured fish was returned to the shop.

Three days later I introduced a Regal Tang (*Paran canthurus hepatus*) and a cleaner wrasse (*Labroides dimidiatus*). Both went into a state of semi-shock when put into the tank. The wrasse lay motionless on the sand and the Tang hid amongst the coral. The lights were left off overnight and the curtains drawn so that the dawn light could break over the tank. In the morning both fish were swimming about freely and the Tang was feeding greedily on the *Caulerpa*. All the fish, at this time, lived peaceably together, the clown always being first to the food and was soon eating off my hand.

One week later I purchased a *Chaetodon chrysurus*, and took even longer to mix the water on introducing the fish. The lights were left out overnight. The following morning I rushed downstairs to view my new purchase, expecting to see it gliding around the tank. Alas, no sign of the Butterfly could be seen. I added a little vitamin soaked food to the tank hoping to induce him to emerge from his hiding place, but it still did not show. After an hour I decided it would be best to look for it. I lifted a piece of living rock and there it was, dead. The disappointment was heart-breaking not only financially but that I had lost such a beautiful fish. On examing the Butterfly I found that a large piece had been torn from its tail and a gaping hole was in its head. I have no doubts that this was caused by the common clown. Needless to say, the clown has now left my tank and has been replaced by two smaller clowns who inhabit the anemone in complete harmony.

The priceless lessons learnt from my experiences so far, are that no matter how docile a species may have been described, you never know how one might react in your particular set-up. You can never take too much time or precautions in introducing a specimen to your tank. Always expect the worse from your fish and take precautions accordingly. If you don't it could turn out to be a very expensive and heart-breaking hobby.

Finally I would like to express my thanks to the proprietor of the Underworld and my wife, without whose patience and help I doubt I would have progressed thus far in this fascinating hobby.

D. S. Elliott,
13, Albert Promenade,
Loughborough,
Leics.

# NEWS ITEMS

**AQUATIC DEVELOPMENT GROUP EXPANSION**

Seven new members have joined the Aquatic Development Group during November, bringing the total to 45.

The Aquatic Development Group is a consortium of companies within the aquatic industry which aims to popularise the hobby throughout the UK and increase the number of people who keep fish in domestic situations.

The new members include:

Algarde Plastic Products Ltd
Dominion Road
Freshwater Road
Dagenham Essex RM1 1RX

JMC Aquatics Ltd
59 Stubley Lane
Dronfield
Sheffield S18 6PG

Buxton Distributors Ltd
Buxton
Norwich

Eric Woods (Rosewood) Ltd
113 Watling Street
Wellington
Telford TF1 2NJ
Salop

Hutchinson Display Units Ltd
4 Burlington Grove
Dore, Sheffield S17 3PH

Seaholme Tropicals
122 London Road
Knebworth
Herts

Hobby Fish Farm
Towcester Road
Old Stratford
Milton Keynes
MK19 6BD

Further information concerning membership and the aims and objectives of the group may be obtained direct from the Membership Secretary, Mrs Maureen Bull, 119 Sandy Lane, South Wallington, Surrey SM6 9NW.

## NEW PRESIDENT FOR EUROPEAN PET FOOD MANUFACTURERS' ASSOCIATION—

MR. DONALD J. MATHIAS, Chairman of the Pet Food Manufacturers' Association, and Chairman of Pedigree Petfoods Limited, has been elected President of the European Pet Food Manufacturers' Association (AEIAAF) with effect from 1st January 1975.

The Association, which is located in Brussels, consists of pet food manufacturers and distributors in the European Community countries. This is the first that a British President has been elected to the Association which was established in 1971. The Association exists to deal with all commercial matters relating to the manufacture and distribution of prepared pet foods, an industry which has an estimated European turnover of £300 million. The Association is particularly concerned with relations with the European Commission, notably with regard to legislative matters which affect the Industry.

Mr. Mathias succeeds Dr. Tom Zaaijer from the Netherlands, who has been President of the Association for the last two years.

Pictured here (left to right) John Ransom, John Allan (Aquariums) of Bury St Edmunds, Keith Barraclough—King British Aquarium Accessories of Bradford and prize winner, 14-year-old Andrew James of Kenley with his new £300 aquarium.

## KENLEY SCHOOL BOY WINS £300 AQUARIUM

ALMOST 2,000 entries were received in the £300 Aquarium competition organised by the Aquatic Development Group to coincide with the Aquarium Show '74, held in the Royal Horticultural Society Old Hall over October 25/27th.

Entrants had to estimate the number of cc's of water contained in a hexagonal Vitacraft aquarium donated by ADG member John Allan Aquariums Ltd., and complete a slogan 'Fishkeeping is fun because . . .'

Entries came from as far afield as Scotland and Cornwall and the estimates of water varied from as little as 8 cc's up to a staggering 2½ million cc's. The slogans varied from 'Keeping Trop's is my Top of the Pops' to 'Fish don't need walking'.

A young man with an eye to the future admitted 'It's easy work for my Mum' and a cry from the heart came from a lady who completed her slogan with the words, 'It's restful, peaceful and keeps the old man from the pub.'

Forty-four entrants estimated the water content to within 5,000 cc's and the winner, 14 year old, Andrew James of Bredune, Kenley, Surrey, carefully calculated the content at 76,597. His entry was the nearest to the correct quantity of water which measured 76,450 cc.

A pupil at Whitgift school, South Croydon, Andrew has kept fish for four years and already has four aquariums in his bedroom.

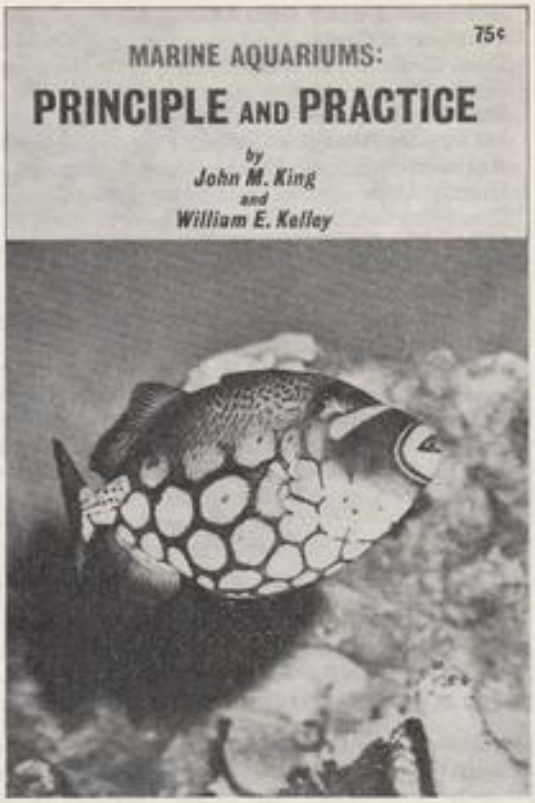
His 'Christmas Present' prize, now holds pride of place in his parents lounge stocked with a selection of fish from ADG member, Aquatic Nurseries and Plastic Plants from King British.

---

"PRINCIPLE AND PRACTICE"——Booklet for Salt Water Aquariums from Aquarium Systems——PUBLICATION of a 28-page booklet with a beautiful full-colour cover which discusses Salt Water Aquariums: Principle and Practice, has just been completed by Marine Biologists John M. King and William E. Kelley of Aquarium Systems, Inc., Eastlake, Ohio, U.S.A.

Claimed the latest and most complete, the booklet provides major basic details including an introduction to the salt water aquarium, the necessary equipment, how to set up the aquarium, the "run-in" and the introduction of the various animals. The booklet also describes the maintenance of the tank, feeding of the animals and disease prevention. The Authors have likewise included a list of "suggested readings" which could further the aquarist's knowledge of the salt water aquarium, its success and beauty.

A free sample is available to wholesalers and retailers upon request. Contact Laboratory Equipment Consultants, 1 Shore Road, Ainsdale, Southport, Lancs, England. Or, write Aquarium Systems, Inc., 33208 Lakeland Blvd., Eastlake, Ohio 44094.




# PRODUCT REVIEW

## THE JERMYN INVERTOR

### Description

THE INVERTOR is a small portable power supply unit which is designed to enable the user to temporarily operate mains voltage electrical equipment from a low voltage battery source during power supply emergencies, or for use in locations where a mains supply is not available. Standard twelve-volt car batteries can provide the required supply.

The unit consists of a small, strong, metal cabinet containing the necessary electronic circuitry. It is fitted with carrying handles and has a standard 13-Amp three-pin socket fitted in its front panel for the easy connection of the equipment which is to be powered. The battery supply is connected by means of heavy-duty crocodile clips fitted to leads extending from the cabinet. Signal lamps indicate the present mode of operation and the availability of the mains supply.

Two models are available; type 150-3 which will supply up to 150 watts of mains-type power and uses one twelve-volt car battery, or type 300-3 which will give up to 300 watts and requires two twelve-volt car batteries connected so as to provide twenty-four volts, i.e., in series. Alternative power sources of the correct voltages may be used, in which case it should be noted that the maximum input current for both models is 17 Amps at these respective voltages. The Invertor can of course also be used as a battery charger.

### Functions

Operation is extremely simple. The unit can be

plugged into the mains supply and connected to the appropriate battery or batteries. The load, i.e., the equipment to be supplied, is then plugged into the socket on the Invertor and will be supplied with power from the mains as long as the supply exists. At the same time the Invertor will keep the battery charged up. On the occurrence of a power cut or other disturbance the supply to the load will be maintained by the unit's instantly switching over to the use of the battery voltage as its energy source. The length of time for which the emergency supply will be maintained will depend upon the load wattage, and at the maximum output for each type of unit the manufacturers state that power will be supplied for three hours from average-sized, fully-charged car batteries. The switch-over is fast and reliable so that there is virtually no interruption of the supply.

When used in remote locations with no mains supply available, the Invertor is simply connected to a pre-charged battery source and the load plugged into it. Again the time for which the supply lasts will depend upon the amount of power taken. Further fully-charged batteries can of course be substituted to extend this time.

**Comments**

The Invertor has several applications in the aquatic field. Two points to consider are its price together with that of the necessary battery or batteries, and the maximum amount of power available. During power cuts of short duration, say a few hours, most large aquaria will not suffer overmuch from temperature problems if they are in normally warm surroundings, and so it is usually more important to maintain air supplies. Overcrowded aquaria, or those relying on complex air-operated environmental maintenance systems, can quickly feel the lack of air, but fortunately our usual diaphragm pumps do not consume very much power. Mr. Chadwick of Jermyn Industries informs me that the 150-3 model should be able to power a ten-watt load for at least ten hours, and many air pumps use even less power than this.

On the question of the initial price, this can be justified in the following cases:—

a) For the protection of a single aquarium stocked with delicate, expensive inhabitants (e.g., marines), where the Invertor could run a large diaphragm pump and for a power filter, and in addition a small heater to minimise temperature change if required.

b) In a fish-house where the air supply is provided by a small compressor, or fan blower, or a column group of large diaphragm pumps, these could be kept going in emergencies. A low power tungsten lamp could also be lit where fishes might be sensitive to sudden total darkness, for instance as when guarding eggs.

c) For the use of air pumps and other mains operated appliances on collecting expeditions and during transport back.

It is as well to emphasise that each emergency installation will have its own maximum working time from one fully-charged low voltage source, depending upon the amount of power required from the Invertor. It would therefore be advisable to test any system, during a period of normal power availability, to determine this time for future reference. If the mains supply to the Invertor is simply switched off this will stimulate a power failure.

Users should note that the success of the whole operation is dependant upon the condition of the battery or batteries. The quality of the electrolyte must be maintained by topping-up with distilled water as required, usually daily. Furthermore the Invertor should not be allowed to drain a battery of its power completely else damage may result. It is of course possible to extend the total time of power availability by disconnecting the battery supply, for, say, alternate hours or half-hours if the aquarium concerned will stand this.

In conclusion I would say that in my opinion the Invertor is a usefull investment for those with expensive, delicate fishes or invertebrates, or with large stocks of the cheaper varieties, especially where these are overcrowded, and in both cases it will find most use in connection with electrically generated air supplies. Heating application using low-powered heaters are also possible. The unit is easy to use, especially when kept already connected, and has the advantage that it will operate automatically during the aquarist's absence. The manufacturers state that a normal car battery can be kept on charge for up to thirty hours without ill-effect.

**Specification**

Size—10 in. × 7¼ in. × 8 in. high, inc. handles.
Weight—20 lbs.
Nominal output—240V r.m.s. square waveform 50 Hz.
Max. charging current—5 Amps reducing to 0·5 Amps typical.
Max. output power—(150-3) 150 watts (300-3) 300 watts.
Max. input current—(150-3) 17 A at 12 V d.c. (300-3) 17A at 24V d.c.

**Price and Distribution**

Model 150-3—£45-00 + V.A.T.
Model 300-3—£65-00 + V.A.T.
Both correct at time of writing.

Supplied by Jermyn Industries, 101 Vestry Estate, Sevenoaks, Kent. Telephone Sevenoaks 59088.

Descriptive leaflet available.

*A. Jenno.*

# From a Naturalist's Notebook

by Eric Hardy

POECILID fishes are a freshwater family of the great order of cyprinodonts, which include many of our coarse fish. In central America dwells an interesting group of them with the barbarous name of Pseudoxiphophorus, which might immediately make you turn over the page of the text book, only that they are viviparous in breeding, and furthermore some of them, though not all, reveal the biological phenomenon of superfetation, or overlapping breeding which occurs in hares and some other mammals. In this they can be developing one unborn embryo inside them while fertilising another, a former of speeded-up reproduction. Furthermore, their tiny egg virtually eliminates the yolk. Small broods occur at 5 to 6 day intervals at the height of reproduction.

At one time they were thought to consist of one species, the Mexican *Heterandria bimaculata*, with a wide, swept-back, grayling-like dorsal fin: but in an illustrated, 16-page publication I've received from San Diego Society of Natural History, R. R. Miller describes another species, *H. jonesi*, the ancestor of them all, which occurs as high as 2,385 metres in the mountains of east-central Mexico. Three or more relatives occur in Guetemala, the Florida lowlands and Nicaragua. Earlier works over-emphasized the importance of dorsal fin-ray numbers in claiming separate species, for these vary in individuals; but the new classification is based on sexual organs. Unfortunately, up to half-a-dozen synonyms exist for each of these in fish-literature, dating back to Tate Regan's work on the group at the British Museum.

Miller's assistant, T. Tymer Jones, found his new species in the crater lake of Lago de Aljojuca, in the high Puebla Plateau, the only fish native to the lake, though nearby lakes had a freshwater relative of the sand-smelts. It is marked by thin vertical bars, cross-hatching and a dark spot near the tail. Females are also sexed by their longer snouts. Their reproductive season is much shorter in the mountains than the lowlands, where large broods occur at 35-40 day intervals.

Spring may again see nature-lovers on a by-road skirting a mere near Hemel Hempstead helping toads and newts reach their breeding pond during the hours of darkness, so that they aren't run over, as in previous years. They seek the toads by torchlight, place them in a bucket and liberate them in the water. Last April some 1,500 toads were thus conducted to safety, while in Cheshire the local county conservation trust couldn't muster a member to protect the natterjacks spawning on West Kirby marsh even in daylight. The south is obviously more conservation-minded.

The stocking of London's Regent's Park lake with fish brought herons and great crested grebes to nest here in the city, where I spent an afternoon watching them last autumn. It was at the lakeside that Sir Charles Symonds, the distinguished neurologist who watches these birds drew my attention to young grebes, their plumeless heads still striped in juvenile plumage, going through all the head-shaking, pond-weed-carrying courtship display of adults. These birds of course are hosts to several fluke-worm parasites of fish.

Honest anglers are not supposed to exaggerate catches more than 25 per cent. Nonetheless, angling weeklies encourage the unscientific pride in catching bigger fish than one's rival, with a monster pike or bream the quickest passport to getting one's photo printed, regardless of its sex or length, the real criterions of its weight. The natural history of how the fish live gets far less notice than how to catch more and bigger specimens than anyone else in the fishing league tables. Last year there was controversial talk about an 8 lb chub from the Olway Brook, tributary of the Usk, claimed to be a record-breaker, whereas at least two chub of 10 lb have been caught in British waters, pre-war from the Crane and post-war from the Bannen. The Hampshire Avon is the major chub-haunt.

Hybrids between bream and roach are frequent in well-stocked fishing waters, and many were netted in the Shropshire Canal during an investigation at its Cheshire stretch near Backford last year. Rudd and crucian carp hybrid's are also found in many waters, but when the canal was netted at Christleton Basin near Chester, several fish were found similar to this but very small, only a couple of inches, and "with a bright blue 'flash' running along the body." An angler commented: "It looks as though someone has released some tropicals into the canal". But these were bitterling, often used for livebait and the surplus liberated at the end of the day. Bitterling are often bred by aquarists using swan- or pond-mussels in their tanks, and the surplus liberated in local waters where they continue breeding in canals and lakes.

A month-by-month survey of the habits of barbel in the middle Severn (where they increased after introduction about 1957) was recently made by University biologists and the British Anglers Association. It met some ill-informed opposition from maggot-throwing match-anglers. The fact that many barbel were being

hooked from the Severn in summer was not so much due to the skill of bank-fishers, but that not all was well with the increasing fish. Many river fish, like tadpoles, shoal when cold winter water reaches them, to conserve body heat, though they are cold-blooded, which means their temperature changes with their surroundings. Incidentally, in the revival of coarse fish on the menu, it should be remembered that the roe of barbel is poisonous.

On bright bit of applied zoology came from a Norwich angler. Faced with the widespread decline of lugworms, which pollution may have caused around English inshore waters in recent years, he found he could still purchase powdered glycine, one of the amino acids isolated from lugworms at the Lowestoft fisheries laboratory. Using this for a substitute angling bait, mixed with meat which it flavoured, he began catching cod, plaice and dabs as before, as these fish hunt by scent.

It is well known that African oxpeckers, related to starlings, feed entirely on the parasites on the bodies of big game, while other birds take parasites from off the hide of rhinos. Dean Amadon, Curator of Birds at the American Museum of Natural History, kindly sent me his fascinating description of mangrove-finches flocking regularly to "groom" the famous Galapagos marine iguanas on Punta Espinos, Narborough (Fernandina) Island, their major haunt. These and other small finches often hop on the inactive reptiles, picking ticks from the rough epidermis and even the eyes of the reptiles. Ticks, beetles and centipedes were found in the stomachs of these birds. Several mites are also parasites on batrachians in south-central America.

Most of us were brought up on the quoted belief that Henry 1st died from eating a surfeit of lampreys; but on reflection it is obvious that his self-indulgence would have been in lamperns rather than lampreys.

Dialects in bird-song have long been known, such as regional variations within the pattern of mistle-thrush and chaffinches: Capranica of Cornwell Fishkopf of Massachusetts Inat, of Technology and Neva of Haifa University have shown similar variation among U.S. cricket-frogs *Acris crepitanz*. However, H. W. and A. I. Platz's work on blood samples of *Rana pipiens* in Arizona suggests that it consists of a complex of several species, which might explain the cricket-frog's vocal differences, for L. E. and J. R. Brown recorded the call types of this complex in Illinois.

If there is anything which brings ornithologists and anglers into conflict, it is the estimated effects of fish-eating birds upon fish stocks. Predatory birds do take more ill or injured effect; but these would have died anyway, so their healthful "pruning" is exaggerated. At the great Lake Kyle, in Rhodesia, F. J. R. Junor found that estimated daily food intake of many fish-eating birds were over-estimated, as percentage of body-weights—grey heron 32·1%, reed-cormorant 33·4% and white-breasted cormorant 22·3%. By hand-rearing, he found the daily food requirements of all adult birds were about 16% of body-weight. Previous estimates included stomach-contents erroneously in body-weight. The grey heron is the common British bird. In Yorkshire a little grebe choked to death trying to swallow a miller's thumb while even wrens have been observed taking small goldfish at a garden pool in Suffolk.

An unfortunate misprint in my October Notebook erroneously read that Mr. Wheeler had sent the first bitterling specimen to me for confirmation when I sent it to him for the B. M. collection, as proof.

---

# W.Y.O.?

*(continued from p. 422)*

a spare aquarium when I received the discus and I had to put it in a community aquarium which houses a collection of small tetras. Although these fishes have not annoyed the discus, when white worms are dropped into the tank they are all eaten by the tetras before the discus has made up its mind to attempt to feed. It does not seem to be interested in flake foods of any kind. Unfortunately I cannot obtain other live foods at this time of year (December). When I kept a few discus previously I was told that they required green food and that they should be given small portions of frozen spinach particles which had been thawed out thoroughly. The spinach certainly seemed to keep the discus in good condition. I must obtain a small packet for my new specimen. (Small packets, obtainable from supermarkets, can be kept for months in the icebox of an ordinary fridge. Slivers may be sliced off, with a sharp knife, and rinsed under a warm tap, to thaw, in a tea strainer.) I'll let you know how my new discus gets along—although I doubt if I shall be able to provide it with a tank of its own. I still consider the discus to be the most attractive, and difficult, tropical freshwater fish.

Please let me have your opinions on the topics below. PRINT your name and address on letters, and please add the date. If possible do not include diagrams with your letters for W.Y.O.? as there just isn't any space to include diagrams in the feature. (1) Please list the reasons why you think aquatic plants should be included in aquaria. (2) What have been your experiences with the use of acriflavine to treat general and specific diseases affecting your fishes? (3) In your opinion, which is the best flake food on the market, and why do you consider it to be so? (4) Please send me details of your experiences with fancy coldwater fishes.

# MARINE QUERIES

by Graham F. Cox

**READERS' SERVICE**
**All queries MUST be accompanied by a stamped addressed envelope.**

**Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex TW8 8BN.**

**I am eighteen years old and have been keeping marines for close on three months. My gravel is made up of a mixture of coral sand and silica gravel. I have used the semi-natural system, the pH is 80, there are no nitrites present and the SG is 1·020. The tank itself is 48 in. × 12 in. × 15 in. and temperature varies from 75° to 78°F. The fish I own at the moment are one 1½ in. Picasso trigger and a 2 in.** *Amphiprion sebae.* **If I remove the trigger would it be possible to house an Emperor Angelfish (adult), a 10 in. moray eel and a** *Forcipiger longirostris* **and one small Rock Beauty? If possible could you please tell me of the living conditions and feeding habits of these fish.**

**P.S.—I change 5 gallons of the water every two weeks. Also may I compliment you on your excellent book "Tropical Marine Aquaria."**

Your tank has a gross capacity of 31 gallons. Making due allowance for your filter-bed, rocks and corals, the true gallonage of seawater is probably around 28 gallons. This means that applying the rule of 1 in. of fish to 2 gallons of water (maximum), you could house a total of 14 in. of fish. Discounting 2 in. for the *Amphiprion sebae* which you intend keeping, this leaves space for 12 in. of fish.

Thus if you could find a SMALL adult Emperor Angel (about 6 in.), a SMALL Yellow Longnose Butterfly (*Forcipiger*) of about 3 in. and a Coral Beauty Angel of around 3 in. you would still be within the maximum stocking limits which are generally deemed to be advisable.

As you can clearly see this would NOT leave us space for a 10 in. Moray Eel, even if you thought it advisable to include one with a 2 in. Clownfish.

Provided that you purchase well-quarantined, clean fishes you will find no difficulty in either keeping or feeding these species. It may be necessary *initially* to offer all of them a little gamma-ray sterilised Mysis shrimp in order to entice them to commence feeding after the shock of capture and transfer to a new tank, but they will quickly proceed on to all the normal foods offered to coralfishes.

I would advise you that there is either something wrong with the formulation of the sea-salt you are using and/or the formulation of the pH Test Kit indicator solution if, with such a lowly-stocked tank and changing 5 gallons of seawater in 28 gallons (i.e., 18 per cent change) every fortnight, the pH of your seawater remains as low as pH 8·0. Finally, I wish to thank you most sincerely for your kind remarks concerning "TMA."

**I have a 48 in. × 15 in. × 15 in. marine tank stocked with two** Stoicactis **anemones, one Fire Clown, one Picasso trigger and one Domino damsel. I use "Synthetica" salt of which I change 5 gallons every three months. I have never had nitrite or ammonia problems. My problem is that the smaller of the anemones will not eat. It does not expand and contract like a healthy one. It was all right for six months and then it started to break up. This lasted for two weeks, the rotten part dropped off which I removed and it has grown again, but it still will not eat.**

**I have used "Sterazin" to get rid of copepods at regular intervals but otherwise the tank is very healthy. The other anemone is large—**

**about 8 in. and eats well. It really thrives with the Fire Clown. In the early days the Domino lived with the small one but now it has given it up. Its tentacles seem insensitive to the touch of food.**

It is always personally shattering to any so-called "expert" in any field to have to admit that he doesn't know the answer to a layman's query concerning that field.

However, Sir, that is what I must do. I do not know what is ailing your smaller anemone. I have considered and reconsidered your query for several days now and have been forced to reject all of the usual possibilities, i.e.:

1. Incorrect pH value of seawater.
2. Incorrect S.G. value of seawater.
3. Incorrect temperature of seawater.
4. Nitrite and/or ammonia toxicity, etc., etc.—on the grounds that your other *Stoicactis* anemone, sharing the same tank, is fit and well.

The only vaguely possible causes of the trouble which I can think of are as follow:

*Possibility* 1—*Avitaminoses*. Let us hypothesis a situation in which your non-feeding anemone was perhaps kept in a dealer's tank in which, owing to pressure of work or oversight, it was not fed for several weeks. Now, if this dealer did *not*, on grounds of expense or whatever, add "Seavita" solution to his seawater, we could reasonably assume that, since the anemone was not being fed either, i.e., it was receiving NO vitamin-containing foods; the animal would, over a period of time, suffer from *avitaminoses*. This is a strong possibility, since I note from your letter that you do not add vitamins to your seawater either. Consequently, having refused food ever since you had it we can assume the following chain of possibilities:

(a) *Non-availability of food* prior to your purchasing the animal led to:
(b) *Avitaminosis*, which led to:
(c) *Anorexia* (disinterest in food) whilst in your sea aquarium, leading to:
(d) further *avitaminosis debility*, and so on.

It is reasonable to assume that this phenomenon would not affect your other anemone in any way since, *already feeding*, it would obtain at least some vitamins from the foods which you offer it (no data supplied by enquirer).

*Possibility* 2—*Disease*. It is possible that your sick anemone has contracted some non-communicable malady (since the other anemone remains unaffected).

However, this doesn't seem very likely since I have never been able to identify *any* pathogens causing disease in invertebrates other than *Pseudomonas*-type bacteria causing the decomposition of areas of damaged tissue. This is not likely to be the problem since you state that although part of your anemone did begin to decompose, this area was eventually shed and has since been regenerated.

Of the above, I favour *Possibility* 1. The vitamin requirements of all invertebrates and *especially coelenterates*, are known to be considerable. I would recommend that you dose your seawater daily with "*Seavita*" solution for seven days and then, on the eighth day, offer a pea-sized morsel of some particularly irresistible sea-food (**must be Gamma-Ray sterilised**) if you wish to avoid the risk of disease amongst your coralfishes, such as *Nephrops* or squid.

**I am a keen marine aquarist and have a 3 ft. × 2 ft. × 2 ft. tank which has been set up for approximately two years. Four months ago I did a partial water change and the fish are in apparent good health. I now find that areas of rich purple are forming, firstly on top of the filtration gravel and have now spread to areas on the coral itself. All the tank readings are correct and the filters are working well. Lighting for the tank consists of one white fluorescent tube and one "Gro-lux" fluorescent tube.**

**Also, I have a Dragonfish** (*Pterois volitans*) **which loses a film-like skin approximately every ten days. Is this in order, as it is otherwise in apparent good health?**

I do not know the specific cause of your red *algae* problem as I am unable to see the tank and carry out checks of nitrite content, pH reading, S.G., temperature, etc., with reliable equipment.

I would advise you to carry out a partial water change, by agitating the base filter-bed (having firstly removed and bleached all the corals, shells, rocks, etc.), and then siphoning away not only 25-33 per cent of the old water, but also as much of the accumulated sea-humus from the filter-bed as possible.

Top up with *chemically-mature* (i.e. 24 hour-aerated) "SYNTHETICA" sea water. This process may have to be repeated several times at 2-3 week intervals.

The continual "sloughing-off" of mucus by your Dragonfish is certainly not normal, but is often witnessed in fishes which are undergoing medication (temporary phenomenon) *or* are suffering from metal poisoning. Do you have an unpainted *aluminium* hood, any aquarium-fittings made of the very cheap, so-called "*stainless*" *steel* we see about today, *nickel*-plated airline valves, etc., etc.?

Another rare, but possible, source of metal poisoning which is very difficult to detect, is the presence of some toxic metal (and *all* metals are toxic in even small excess to marine-life, except iron) object, such as copper, zinc, aluminium, chromium, nickel, lead, silver or gold *actually present in your filter-gravel*.

# *Girardinus metallicus*

*Written & Illustrated*

*by Jack Hems*

THIS splendid livebearer, of the family *Poeciliidae*, is appearing in dealers' stock tanks after an absence of many years. Charles Frederic Girard, from whom it gains its generic name, was a distinguished American ichthyologist who lived from 1822 to 1895. Nevertheless, it was another New World ichthyologist, Felipe Poey, who lived about the same time, who described the fish for science.

*G. metallicus* was originally confined to Cuba. Nowadays, however, it is not unlikely that it may be found living in the wild state elsewhere for, like several other poecilids such as the ubiquitous guppy (*Poecilia reticulata*), it is an avid eater of the *larvae* of mosquitoes and therefore is clearly regarded as a benefactor of man. (In this connection, it is interesting to note that the guppy, in the early years of the present century, was introduced into Africa and Asia to help combat malaria, while species of gambusia may be found even farther afield; for, according to Sterba, a single gambusia can destroy its own weight in disease-spreading pests daily.)

*G. metallicus* is characterised by its slender lines, a flat-topped head, rather large scales, and a perky dorsal fin set near the middle of the back. The male has a noticeably prolonged gonopodium or sperm-shooting organ, with two horn-like appendages at the tip, and attains a length of roughly 1¾ in. The female reaches about twice this size.

Generally speaking, the coloration of *G. metallicus* is yellowish grey to muddy green reflecting, when viewed under a strong light, shimmering patches and flecks of blue on a brassy ground. The underparts are white. The sides of the male are adorned with more than a dozen boomerang-shaped short black bars. The intervening spaces are silvery to shining leaden grey. Some black markings are present in the yellowish dorsal fin and a black blotch is situated at the base of the tail.

The female may or may not display black bars on the sides but she invariably sports a chain of silvery markings along the middle of her body. She also has a black spot in her dorsal fin. For all that, the colours and arrangement of colours of this species are rather variable and not a few *G. metallicus* are more interestingly and handsomely garbed than others.

*G. metallicus* is always on the go in all levels of the water and the libidinous male keeps the female habitually pregnant. The young are born every five weeks or so if a temperature in the upper seventies (°F) is maintained. At a much lower temperature, say, 70°F (21°C), the intervals between parturition are much wider apart. The number of fry delivered at a spawning is determined by the age of the female. A young female may not drop more than about a dozen young. A mature female up to about 100. The fry come into their small watery world well aware of the predatory instincts of their parents. Hence they instinctively seek the safety of massed growths of plants. Therefore, to breed this fish successfully a tangle of submerged vegetation extending from the floor of the aquarium to the surface is advised. Better still, separate the fry from the parent fish at the earliest possible moment.

Feeding *G. metallicus* is no problem, for it takes dried food, small live food, and minute pieces of red meat quite readily. It also is a great picker at mossy *algae*. Fry make rapid growth on such things as brine shrimps, micro worms, gnat *larvae* and powdered flake food.

Because *G. metallicus* minds its own business, it can be placed with other small fishes in a community tank where its lively movements and sparkle add extra attraction to the set up. To see and keep this fish at its best very clear and clean water is recommended. Given this it will live for upwards of two or three years.

# CLASSIFICATION OF FISHES

*by Roger T. Chambers*

ONE OF THE first things of which the budding aquarist becomes aware is that some fish have English names and some have "Latin" names. The purpose of this article is to describe the reasons for this and the basis for it. Perhaps it should be made clear at the outset that the expression "Latin name" is, in fact, wrong as many of them are not Latin. It is preferable to refer to "scientific names."

From the beginning of time men have found it necessary to classify animals in various ways. Many of these are still in everyday use and one refers, for example, to edible fish and poisonous fish; to marine fish and freshwater fish; and, even, to big fish and little fish. These classifications can be, and commonly are, broken down into subordinate categories which may or may not be relevant to the superior category. For example, marine fish can be divided into tropical and temperate or littoral and pelagic but a "family tree" of marine fish could not show all four of these subordinate classifications on the same chart, because both tropical and temperate fishes can be either littoral or pelagic.

It can be seen, therefore, that fishes can be classified according to their utility, their size, their colour, the chemical composition of their environment, their geographical distribution or in an almost infinite variety of other ways. But the use of such classification systems is limited to say the least. What, for example, does the statement "this fish comes from Malaysia" tell us beyond that single fact? One may infer perhaps that it is a warm water species but some tropical countries do have "cold" water systems, so even that is not certain.

Another disadvantage is that such classifications must result in very large groupings and once groupings grow to a certain size they become difficult to comprehend and hence less useful.

One must recognise that ichthyology is only one branch of biological science and that fishes are only one group of living organisms. We speak of plants and animals and we talk of trees and mushrooms and we talk of mammals and birds. Fish, of course, are animals as are spiders and snails, birds and lizards. We readily comprehend that waterfowl are easily distinguishable from birds of prey. Few people would mistake a duck for an eagle but many would not know the difference between a large duck and a small goose.

It can, therefore, be seen that we already have the beginnings of a "natural" system of classification in which we divide living organisms into plants and animals and animals into mammals, birds, fishes, reptiles and amphibians. The more sophisticated also divide animals into insects, molluscs, crustacea and the like. It is not intended at this stage to argue the validity of these groupings, but only to point out that there is a basis for discussion.

Around the beginning of the eighteenth century biologists were starting to feel the need for a useful system of classifying animals based on "natural divisions" and perhaps the honour as the first person to give precision to the problem should go to the English naturalist, John Ray. However it is to Carl von Linné, a botanist, that has gone the credit for devising the first system of classification and nomenclature. His system is still in use today throughout the scientific world although it has been modified.

Carl von Linné was a Swede but as scientific writing of the day was universally in Latin he is more often known as Linnaeus, the Latinised version of his name. It is because of the importance of Latin that some people refer to Latin names. In fact the names are Latinised names. Many are actually based on Greek words or even on French or English words. A not inconsiderable number are in the language of the locality where the fish lives or are names of people. They are Latinised to the extent that the endings must be grammatically correct. It is to be hoped then that

The law of precedence is of prime importance in avoiding confusion and the first published name for a given animal must always be used subsequently. This is not to say that names cannot be changed. On the contrary aquarists will know well that they frequently are: even the guppy should now, some authorities state, be *Poecilia reticulatus* and not *Lebistes reticulatus* a name by which the species has long been known. The reason is that systematic knowledge, like other knowledge, develops and if it is eventually shown that a species should belong to a different genus or if a worker reclassifies a group of animals using different genera, then new names are in order. It may be that when a new generic name is given that another species within the genus already has the same specific name. In that event the law of precedence applies and the first used name is applied.

The effect of all this is that most animals soon become known by various synonyms and scientific papers normally include reference to these to help in avoiding confusion. The question of the validity of revisions is one of some difficulty and there is frequently room for debate. Many readers will recall the recent debate on the revision of the genus *Barbus* and be aware that even eminent systematists can disagree. For the ordinary aquarist, of course, it is a matter of little moment whether the cherry barb, for example, is correctly called *Barbus titteya* or *Puntius titteya* providing that he is aware they are synonyms. Taxonomic revision, it should not need to be emphasised, is a highly complicated exercise requiring considerable expertise and is not something to be tackled lightly.

When an apparently new species is discovered there are several well defined procedures to be followed. The first of these is obviously to check that the species is indeed new.

Competent ichthyologists will probably have little difficulty in assigning the fish to a particular family. Family diagnoses are available in systematic reference books and these can be checked against the observed features of the new fish. It will then be necessary to carry out a search of the literature to establish whether it has already been described. This is assisted by the use of keys which attempt to provide a way of running down a species using the question/yes/no technique such as one often sees in books on flower identification.

The Zoological Society of London annually publishes the "Zoological Record" which is a classified index of all published material relating to zoological subjects which appear in books and scientific journals throughout the world. The taxonomist will need to consult all material published relating to the family to which he has assigned the new species. This may well result in the discovery that the species is already known.

Having established that the species is indeed new the author must provide a comprehensive description and publish this in one of the recognised journals. A description in an obscure magazine especially one of a general nature can lead to serious difficulties later as this may lead to the article being missed by the "Zoological Record", whereas a journal such as "Nature" or the "Stanford Ichthyological Bulletin" will be scoured as a routine.

The publication of a species description involves the selection of an example of the species to describe. This example is known as the "holotype" and this should be carefully preserved for future use in a reputable institution, such as The British Museum or The Smithsonian Institution, which can ensure its safety and accessibility. It must be remembered that any systematic revision which may in future be contemplated will be made much easier if the original specimens are available for study.

It is, of course, necessary to provide a name for the new species. It will often be the case that the taxonomist will have assigned the species to an existing genus in which case he will merely have to select a specific (or trivial) name.

He can let his imagination run riot but it is important that the grammar should be correct and it is helpful if it is reasonably pronounceable by those who are not Latin scholars. *Aphyosemion sjoestedti* is all very well, but how do you pronounce it?

In the event of it being necessary to describe a new genus the same remarks about publication and the selection of the example apply. In this case the holotype is also the type species.

There are various other types which one may encounter in taxonomy. Especially when one is concerned with very small animals such as, for example, crustacea it is often impossible adequately to preserve the holotype although this should be attempted. In this circumstance the taxonomist may provide several "syntypes" which he declares are the same species.

If one of these syntypes is subsequently selected as the "original" it is known as the "lectotype" and the remainder are "paratypes". Occasionally the holotype is lost or destroyed and it becomes necessary to select a replacement; this is the "neotype". Which all sounds much more complicated than it really is.

One final definition: a taxon (plural taxa) is any of the groups of classification referred to earlier, so that one can refer to "class' as being one of the higher taxa and subspecies as being the lowest taxon.

I give below a list of the families of "aquarium fishes" (if I am still permitted to use such a classification). The list is not exhaustive but includes most of the commonly kept groups. I also, for illustration, give a detailed classification of the harlequin fish *Rasbora heteromorpha*. Perhaps it should finally be emphasised that it is perfectly possible to maintain

chaetodontidae, the marine butterfly fishes, and the damsel fishes (pomacentridae) are both members of the order perciformes as are the percidae, the perches, and so one is aware that marine and freshwater species can belong to the same group.

It is interesting to note that the phylum chordata is sub-divided into two sub-phyla: protochordata and vertebrata (or craniata) i.e. the vertebrates. There are seven living classes of vertebrata; mammalia, aves, reptilia, amphibia, agnatha, chondrichthys and osteichthys. The first four of these are generally recognisable but it might be worth looking more closely at the last three. These three groups are all fishes. The agnatha are sometimes called cyclostomes and include the lamprey *Lampetra planeri*. The chondrichthys are the cartilaginous fishes such as as sharks, rays and skates. The osteichthys are the bony fishes and include all those commonly seen in the home aquarium. This suggests that a Siamese Fighting Fish is as closely related to a fox as it is to a humming bird or a shark. It may be a surprise to say this is correct!

This is more easily accepted when one remembers that a newt is more closely related to a frog which it does not resemble than to a lizard which it does resemble. A slow-worm also is more closely related to a common lizard which it does not resemble than to a snake which it does resemble.

One of the first rules of taxonomy, that is the classification of species, is that divisions should be differentiated from one another by equal amounts. In other words, all the seven classes of vertebrata are equally different from each other and all the fifty-four families of perciformes are equally different from each other. Furthermore, the seven families comprising the order cottiformes are equally different from each other and the differences between them are equal to the differences between the fifty-four perciformes.

It will be readily appreciated that evaluating these differences is extremely difficult and even with suitable training it is more of a theoretical ideal than a practical reality. In fact there is no way of properly estimating the equivalence of anatomical difference in very widely separated species.

We have so far been considering the subject of classification. This is quite distinct from nomenclature although it is clearly related. The system of nomenclature which is now universally accepted by biologists is the Binomial System. This was the system devised by Linnaeus and first published in his "*Systema Naturae*". In this system all animals are given a name comprised of the generic name and the specific name. By this means any animal can be identified exactly whatever the language of the worker. A third name may be added to signify a sub-species, thus *Salmo clarki stomias* indicates that the animal in question, the greenback cutthroat trout, is a member of the genus *Salmo*, with the specific name *clarki* and of the sub-species *stomias*.

If an animal has a sub-generic name it can be included in parenthesis after the generic name; however, these are seldom used except by specialists. [It should be noted that synonyms should not be included in the name unless preceded within the parenthesis by the sign '=' as in *Xiphophorus* (=*Platypoecilus*) *maculatus*].

There are a number of conventions to be observed in the use of scientific names. The specific name should always begin with a lower case letter, and the generic name with a capital as in *Betta splendens*. *Betta Splendens* is wrong. The only time when it may be permissible to use a capital for the specific name is where this is the name of a person such as in *Hyphessobrycon Herbertaxelrodi*. It is also important, as mentioned earlier, for the specific name to agree grammatically. Hence "Herbertaxelrodi" is correctly in the genitive (possessive case) and not in the nominative (substantive) as in *Etroplus maculatus* where it is in the form of an adjective.

In using scientific names one should avoid the over frequent abbreviation of the generic name. No generic name can be used for more than one genus within the animal kingdom but specific names may be used many times within even a single order. Specific names such as *punctata* and *maculata* occur frequently and while one may deplore the lack of imagination displayed by the author they are at least appropriate. One should only abbreviate a generic name when it has been used in full within the text of the same passage.

Frequently one will find appended to a scientific name, another name. The scientific name should always be in italics (not in parenthesis) and the other name in ordinary type, thus: *Acipenser oxyrhynchus* Mitchill. This indicates that the species in question was first described using the given specific name by the person named, that he is the author. This name should not be abbreviated as this may cause inconvenience to future workers. The only exception to this rule is where the species was first described by Linnaeus and in this case his name is usually abbreviated to L. or Linn. Often the author's name is included in brackets: *Arapaima gigas* (Cuvier) and this, it should be noted, is not an alternative but indicates that the species although originally described by the named author has subsequently been ascribed to a different genus. It is important that no-one, may change the specific name, once given, even if it is subsequently found to be inappropriate. The only exception is where it is shown that the name has already been used within the correct genus by a previous author. Often a date will follow the author's name and this is the date the species was originally described: *Acipenser oxyrhinchus* Mitchill 1814 and *Arapaima gigas* (Cuvier 1817).

The law of precedence is of prime importance in avoiding confusion and the first published name for a given animal must always be used subsequently. This is not to say that names cannot be changed. On the contrary aquarists will know well that they frequently are: even the guppy should now, some authorities state, be *Poecilia reticulatus* and not *Lebistes reticulatus* a name by which the species has long been known. The reason is that systematic knowledge, like other knowledge, develops and if it is eventually shown that a species should belong to a different genus or if a worker reclassifies a group of animals using different genera, then new names are in order. It may be that when a new generic name is given that another species within the genus already has the same specific name. In that event the law of precedence applies and the first used name is applied.

The effect of all this is that most animals soon become known by various synonyms and scientific papers normally include reference to these to help in avoiding confusion. The question of the validity of revisions is one of some difficulty and there is frequently room for debate. Many readers will recall the recent debate on the revision of the genus *Barbus* and be aware that even eminent systematists can disagree. For the ordinary aquarist, of course, it is a matter of little moment whether the cherry barb, for example, is correctly called *Barbus titteya* or *Puntius titteya* providing that he is aware they are synonyms. Taxonomic revision, it should not need to be emphasised, is a highly complicated exercise requiring considerable expertise and is not something to be tackled lightly.

When an apparently new species is discovered there are several well defined procedures to be followed. The first of these is obviously to check that the species is indeed new.

Competent ichthyologists will probably have little difficulty in assigning the fish to a particular family. Family diagnoses are available in systematic reference books and these can be checked against the observed features of the new fish. It will then be necessary to carry out a search of the literature to establish whether it has already been described. This is assisted by the use of keys which attempt to provide a way of running down a species using the question/yes/no technique such as one often sees in books on flower identification.

The Zoological Society of London annually publishes the "Zoological Record" which is a classified index of all published material relating to zoological subjects which appear in books and scientific journals throughout the world. The taxonomist will need to consult all material published relating to the family to which he has assigned the new species. This may well result in the discovery that the species is already known.

Having established that the species is indeed new the author must provide a comprehensive description and publish this in one of the recognised journals. A description in an obscure magazine especially one of a general nature can lead to serious difficulties later as this may lead to the article being missed by the "Zoological Record", whereas a journal such as "Nature" or the "Stanford Ichthyological Bulletin" will be scoured as a routine.

The publication of a species description involves the selection of an example of the species to describe. This example is known as the "holotype" and this should be carefully preserved for future use in a reputable institution, such as The British Museum or The Smithsonian Institution, which can ensure its safety and accessibility. It must be remembered that any systematic revision which may in future be contemplated will be made much easier if the original specimens are available for study.

It is, of course, necessary to provide a name for the new species. It will often be the case that the taxonomist will have assigned the species to an existing genus in which case he will merely have to select a specific (or trivial) name.

He can let his imagination run riot but it is important that the grammar should be correct and it is helpful if it is reasonably pronounceable by those who are not Latin scholars. *Aphyosemion sjoestedti* is all very well, but how do you pronounce it?

In the event of it being necessary to describe a new genus the same remarks about publication and the selection of the example apply. In this case the holotype is also the type species.

There are various other types which one may encounter in taxonomy. Especially when one is concerned with very small animals such as, for example, crustacea it is often impossible adequately to preserve the holotype although this should be attempted. In this circumstance the taxonomist may provide several "syntypes" which he declares are the same species.

If one of these syntypes is subsequently selected as the "original" it is known as the "lectotype" and the remainder are "paratypes". Occasionally the holotype is lost or destroyed and it becomes necessary to select a replacement; this is the "neotype". Which all sounds much more complicated than it really is.

One final definition: a taxon (plural taxa) is any of the groups of classification referred to earlier, so that one can refer to "class' as being one of the higher taxa and subspecies as being the lowest taxon.

I give below a list of the families of "aquarium fishes" (if I am still permitted to use such a classification). The list is not exhaustive but includes most of the commonly kept groups. I also, for illustration, give a detailed classification of the harlequin fish *Rasbora heteromorpha*. Perhaps it should finally be emphasised that it is perfectly possible to maintain

an attractive tank of these pretty fish without being able to classify them or being aware of the scientific name!

| | |
|---|---|
| Kingdom | : Animalia |
| Phylum | : Chordata |
| Sub-Phylum | : Vertebrata |
| Class | : Osteichthys |
| Sub-class | : Actinopterygii |
| Super-order | : Teleostei |
| Order | : Cypriniformes |
| Sub-order | : Cyprinoidea |
| Family | : Cyprinidae |
| Sub-family | : Rasborinae |
| Genus | : Rasbora |
| Species | : Heteromorpha |

*Familes of Aquarium Fishes within the Class Osteichthys*

| | | |
|---|---|---|
| Order: Lepidosireniformes | | |
| Family: | Lepidosirenidae | lungfishes |
| | Ceratodidae | Australian lungfishes |
| Order: Clupeiformes | | |
| Family: | Sternoptychiidae | hatchet fishes |
| | Salmonidae | salmons and trouts |
| | Thymallidae | graylings |
| | Esocidae | pikes |
| | Umbridae | mud minnows |
| | Osteoglossidae | bony tongues |
| Order: Cypriniformes | | |
| Family: | Characidae | characins and tetras |
| | Cyprinidae | carps and minnows |
| | Cobitidae | loaches |
| | Siluridae | European and Asian Catfishes |
| | Clariidae | Clarias catfishes |
| | Loricariidae | Armoured catfishes |
| Order: Anguilliformes | | |
| Family: | Anguillidae | Freshwater eels |
| Order: Notacanthiformes | | |
| Family: | Notacanthidae | Spiny eels |
| Order: Beloniformes | | |
| Family: | Hemiramphidae | Halfbeaks |
| Order: Gasterosteiformes | | |
| Family: | Gasterosteidae | Sticklebacks |
| | Syngnathidae | Sea horses |
| Order: Cyprinodontiformes | | |
| Family: | Cyprinodontidae | Killifish |
| | Poecillidae | Live bearers |
| Order: Perciformes | | |
| Family: | Percidae | Perches |
| | Chaetodontidae | Butterfly fishes |
| | Chichlidae | Cichlids |
| | Pomacentridae | Damsel fishes |
| | Labridae | Wrasses |
| | Anabantidae | Labyrinths |
| Order: Pleuronectiformes | | |
| Family: | Cynoglossidae | Tonguefishes |
| Order: Tetraodontiformes | | |
| Family: | Balistidae | Trigger fishes |

# TRAVEL NEWS

AIR MALAWI the National Airline of the Republic of Malawi commenced operation of VC10 services between London (Gatwick) and Blantyre on 3rd December, 1974. Operating for the first time in AIR MALAWI livery the new service will replace the former contractual arrangement with British Caledonian Airways. This once weekly flight will complement the similar British Airways VC10 service from London (Heathrow) to Blantyre.

British Airways are General Sales Agents for AIR MALAWI. Passenger reservations will be available through all British Airways sales and reservations offices. London central reservations (01) 828 9711.

Cargo reservations and reception at both Gatwick and Heathrow will continue with British Caledonian Airways (01) 668 9311. British Caledonian will also provide major maintenance and engineering services at Gatwick.

AIR MALAWI will open a sales office at Gatwick to assist in customer services and AIR MALAWI's marketing effort in the United Kingdom. The office is located at Gatwick Airport South, telephone number Crawley (0293) 512906/7.

AIR MALAWI operate BAC 1-11, Viscount and HS 748 jet and propjet equipment to points in East Africa, Mozambique, Southern Africa, Zambia and Seychelles, offering many connections with the VC10 services to London.

AIR MALAWI's schedule from the 3rd December will be:

| | | | | |
|---|---|---|---|---|
| **Southbound** | Tuesdays | | | |
| | dep | Gatwick | 2130 | QM103 |
| | arr | Blantyre | 1100 | Wednesday |
| **Northbound** | Sundays | | | |
| | dep | Blantyre | 2115 | QM104 |
| | arr | Gatwick | 0645 | Monday |

# OUR EXPERTS' ANSWERS TO YOUR QUERIES

**READERS' SERVICE**
**All queries MUST be accompanied by a stamped addressed envelope.**

**Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.**

## TROPICAL QUERIES

by Jack Hems

**I should appreciate some information on the genus *Tilapia*.**

Firstly, most fishes of this genus attain a fairly large size, so it is of supreme importance to place them in a tank which will afford them room to grow and swim around in. They are not very particular about temperature and flourish well at the regular range of from about 72°F (22°C) to 75°F (24°C). A mixed diet of meat, worms, and the like, greenstuff and a well-balanced dried food suits them well. Some species spawn in depressions they fan in the sand or on rocks, yet not a few are mouthbrooders. They are not overtly aggressive but should not be kept with other fishes unless they are of about their own sturdy build and size. Further, a male in breeding condition can be very spiteful towards other fishes and the females of his own kind.

**How can I rid my aquarium of blue-green *algae*?**

Remove all the sheets of this slimy growth that you can from the tank and then provide a strong enough light to grow higher plants well. Now plant the bottom thickly with strong-growing plants such as cryptocorynes, sagittaria, hygrophila and so forth to rob the *algae* growth of the nutrients it needs to prosper.

**What information can you give me about the care and requirements of the bala shark?**

*Balantiocheilus melanopterus* demands plenty of swimming space in clear and well-aerated water. It requires a temperature in the middle to upper seventies and feeds on mossy *algae*, anything alive and small enough to swallow, dried food and tiny pieces of lean meat. It is not an aggressive fish but as it attains a length of more than 6 in. it is not suited to a community tank stocked with diminutive fishes.

**I am keen on breeding the Jack Dempsey fish and would like your advice on a suitable food for the fry.**

The fry of the Jack Dempsey cichlid are quite large when they hatch out and after about two or three days on such things as large infusorians and micro worms should be given Grindal worms, gnat *larvae*, chopped *Tubifex*, shredded raw red meat and so on.

**Which is the most bloodthirsty piranha?**

This is not an easy question to answer, for all the true piranhas of the genus *Serrasalmus* are avid eaters of flesh torn from their victims. However, the red-bellied piranha (*S. nattereri*) is said to be one of the most feared and dangerous species to encounter in the natural state.

**I cannot make up my mind whether to install a top corner filter or an under-gravel filter. Tanks employing the latter type of filtration always look beautifully clear, but I have been told that this type of filtration precludes a proper growth of plants. What is your opinion?**

Provided you pile the compost over the filter plates to a depth of more than 2½ in. the plants should do well. At any rate, various cryptocorynes, aquatic ferns, hygrophila and sagittarias grow very well in my own tanks employing under-gravel filtration.

**A few weeks ago, I purchased an apple snail and would like to know the best temperature for it and a suitable food.**

Most apple snails (*Ampullaria*) are great eaters of greenstuff and will soon clear an aquarium of plants. Therefore they should be given a tank to themselves and fed on the leaves of water plants, cooked spinach, scalded lettuce, and the like, and small amounts of flake food. A temperature in the seventies (°F) is quite suitable.

**I bought two catfish and a few days after I got them home they developed fin-rot. So I placed them in a small tank filled with salted water. The following day they died. What do you think killed the fish?**

All I can suggest is that the salt killed your catfish. Some catfish are sensitive to salt, as are some loaches, and you should have discussed this matter of a cure with a knowledgeable dealer, for he could have supplied you with a suitable remedy.

**I should welcome some advice on the keeping of the live-bearing halfbeak.**

The chief essentials are shallow water and a supply of small livefood such as *Daphnia*, mosquito *larvae*, and any tiny creatures such as green or black fly, fruit fly, spiders or Grindal worms (dispensed through the perforations of a worm-feeder). Because the halfbeak does not frequent the bottom of the water, a *Corydoras* catfish or two should be kept to clear up any food that wriggles or hops on the compost.

**I read in a book that *Barbus conchonius* will live all right in a coldwater tank. I placed a pair in an unheated tank and they died. Was the book wrong?**

*B. conchonius* is from India and flourishes best at a temperature in the neighbourhood of 72°F (22°C) to 75°F (24°C). But be all this as it may, *B. conchonius* can stand a very gradual fall in temperature to comfortable room temperature, but this should not be very prolonged, for a low temperature, that is in the sixties (°F), is not advised for any domesticated fish which has been kept and bred for scores of years at a regular tropical range of temperature.

**Recently I bought several different species of *Cryptocoryne* and soon after planting them they went soft and lost their leaves. The tank is 3 ft. long and is illuminated by a 30-watt fluorescent light kept switched on for 10 hours a day. My local dealer told me that the light was not strong enough for cryptocorynes and recommended the addition of two 40-watt tungsten lamps. I followed this advice, but up to the present time there is no improvement. Please may I have your comments on this matter.**

A 30-watt fluorescent lamp is sufficiently bright to grow most plants in a 3ft. tank. You must have patience and leave what is left of the plants undisturbed. Cryptocorynes sometimes lose their foliage after a change of conditions, but usually sprout new leaves provided the rootstock is firm and sound.

**After introducing some wood bark into my aquarium, the fishes began, and continue, to rub their sides and underparts against the compost, plants, and heating apparatus in the aquarium. Please can you tell me what is the matter with them?**

In all probability there is an excessive amount of tannic acid in the water (has the water assumed an amberish tint?) and this would cause an irritation of the skin. Siphon off a quart or two of the water every few days and replace with fresh at aquarium temperature. Before long, the inhabitants of your tank should return to normal.

**I would like to grow brine shrimps to a size large enough to feed fishes larger than fry, say, of about the build of neon tetras or full-grown guppies. How should I set about it?**

Allow the brine shrimps plenty of space in water which is well aerated and slightly more salty than usual. Feed them on infusorians or green water or both.

**Can you tell me something about the firetex cichlid?**

Sometime in the late 1960s or early 1970s, a female firemouth (*Cichlasoma meeki*) and a Texas cichlid (*C. cyanoguttatus*) spawned and produced young. This event took place in an aquarium owned by an American aquarist named Robert L. Ozibiko, and a detailed account of this spawning was printed in the October, 1971, issue of *The Aquarium*, now no more. The fry were a mixed lot, that is in coloration and body shape. Whether these hybrid fish were developed into a new hybrid strain, I do not know.

---

# COLDWATER QUERIES

## by Arthur Boarder

**Would it be possible to raise fish for eating in coldwater butts outside in this country? If so what fish would survive the winter, where could I get them and how to feed them?**

It would be possible to put a three inch carp in a water butt and after about five years with good feeding, it could be large enough for your breakfast. A butt is a very bad receptacle in which to try to keep fish alive. I found this out over seventy years ago when trying to keep roach and dace alive in such a butt of rain water, for my father to use as live bait on his angling outings. I found it impossible then as the

surface area of the water was too small for the depth. In olden times the monks used to raise carp for eating but they used fairly large ponds, many of which may be seen around the country to this day, especially in the vicinity of old monasteries and priories. Carp can be obtained from any well established dealer and they are quite hardy in this country. Their food consists of the types as used for feeding goldfish.

**My goldfish are continually rubbing themselves against the stones and gravel in the tank. Why is this please?**

Goldfish sometimes rub themselves on objects in a tank to rid themselves of pests which are causing them irritation. They will also do this when the water is not to their liking. If it becomes over-charged with minerals the fish may then rub against rocks and gravel. Such pests as flukes will almost always cause the fish to act in this manner. When this happens the fish remove much of the mucus covering and so leave themselves open to easier attacks from the pests. Usually a healthy fish is so covered with mucus that flukes cannot get a firm hold on them. If flukes are present the fish will show some signs other than the rubbing. These pests usually only attack young fish and when they get a firm hold and increase in numbers the sides of a fish can become blood streaked. They also lose their appetites and mouth at the surface. They gradually weaken and become emaciated and finally die. Death does not come quickly when a fish is attacked and so there is time to effect a cure. Immerse the affected fish in a solution of T.C.P. or Dettol at the rate of a half teaspoon to the gallon of water. Only leave the fish in for a half minute and remove to fresh water if it turns over. You may have to repeat the process after a week.

If you examine an affected fish with a powerful magnifying glass the flukes may be seen as tiny leech-like creatures which can move about on a fish like a looper caterpillar. They take a firm hold with the rear end and reach forward for a hold with the front end, then releasing the rear for a hold close to the front end and so progress along the fish. There are two main types which attack fishes, the *Gyrodactylus* and the *Dactylogyrus*.

**I have a semi-circular pond in the garden, about eight feet long and three feet wide tapering off at each end. It is one foot deep. I have thirty various coldwater fishes but I have lost one and the others do not appear to be healthy. What can I do?**

I suggest that your troubles may be due to the fact that you are trying to keep too many fishes in your pond. With the tapering ends and the foot depth the pond cannot contain a large amount of water. When fishes are at all crowded they will not thrive nor live for long. One or two will become weakened and ultimately die. Once the general health of a fish deteriorates one of the first signs is that the protective mucus covering becomes deranged and so loses its power. The consequence is that any pests or germs of diseases which may be present in the water can soon attack the fishes and the trouble could spread to several fishes. You state that you have removed the water plants from the pond as you thought that they were the cause of the poor health of the fishes. This should not be so, as they are more likely to do good than harm, unless they had been recently introduced from a natural pond. Many pests and diseases can be brought into a pond from the wild and it is most unwise to resort to this procedure. Lessen the numbers of fish in the pond.

**I have a coldwater tank, 24 × 12 × 12 in., and recently the water has become saturated with minute white flecks, just like dust, which swirl about in the water. The fish appear to be in good health, so what can be the cause of this floating matter?**

The white specks are infusoria. The minute creatures must be very numerous for you to see them so thickly. Infusoria can only live and multiply as long as they can find sufficient food in the water. Their food consists of smaller forms of life, both plant and animal. You may have been over-feeding your goldfish and any food not eaten will soon provide the right conditions for the multiplication of the infusoria. Change all the water in the tank and then go easy with the feeding. Many aquarists fail to realise that once the water in a tank becomes colder with the approach of winter, the fishes will lose their appetites and any food given, in the amount as when the water was warmer, will be too much for the fishes to clear up quickly.

**I have a goldfish which has an enormously long caudal fin and its body is quite elongated. It is so different in shape from my other goldfish that I wonder what kind of fish it can be and wonder if you can recognise it from my description?**

From your description I feel certain that your fish is a comet goldfish. This is just a variety of the ordinary goldfish and should have the elongated body and long flowing caudal fin as you have described. Such fishes are more suitable for a garden pond than for a tank as they are fast swimmers and like plenty of space in which to move around.

**I have recently bought a three inch black moor and although it appears to be healthy it does not eat. I have offered it flake food, dried daphnia, pellets and live *daphnia* but it refuses to eat at all. What shall I do?**

Your fish should be called a moor as the adjective black is quite superfluous. If the fish was not black it

would not be a moor. One reason why the fish is not eating is that it may have been bred and reared under tropical conditions, that is in a water temperature of about 70°F. When you put it in an ordinary coldwater tank it would become upset and go off its food. As long as the fish looks in good health there is nothing to worry over. All varieties of goldfish can go for long periods without taking any food and be none the worse for it. If the temperature of the water in the tank rises to just above 60°F., the fish should soon take food. The live daphnia should encourage it to do so more than most other foods.

**I have a pond about 500 gallons in capacity in which I keep eight Koi carp. Two years ago I noticed a few black spots about an eighth of an inch in diameter on the sides of some of the fish. Since then none of the large spots have appeared but now there are a number of smaller spots about the size of a pin's head on some of the fish. The fish do not appear to be in any distress and so what can have caused the black marks?**

It is difficult to be certain what has caused the black marks on your Koi. It is a well known fact that golden orfe are often well covered with black markings and there appears to be no particular reason for this. However the small black spots on your Koi suggest that the fish have been attacked by a parasite. The larger ones could have been the result of an infestation by fish lice, (*Argulus*) and the smaller spots indicate that the pests could have been white spot parasites. It is a fact that many varieties of goldfish will show black marks where the flesh or skin has been injured. This is when the new growth appears. This new growth is black at first but gradually fades away. This same occurence can be observed with the young of goldfish which are bronze when very young but as the colour changes so the upper parts of the fish become quite black. This black then gradually fades, the back and dorsal fin being the last to lose the black. You should examine your Koi to make sure that they are not infested by any pests or your troubles could continue. Once you can find the cause the necessary treatment can be tried.

**I have been given four six inch goldfish but as I live in a maisonette I have only a concrete patio. Could I keep the fish in an old coldwater tank and if so what would the measurements have to be?**

Most coldwater cisterns are about two feet by eighteen inches in surface area. This would be all right for your fish. However unless the tank was very old, it might be dangerous to fish as fresh galvanising can harm them. I used many of these cisterns for rearing fry but all tanks were washed over inside with a wash of cement and fine sand. When dry they were well washed out to remove any fresh lime. You will find that Hornwort is a good plant for such a tank as this plant will thrive in deepish water.

**I have a fairly large goldfish which cannot swim properly. It hangs at the surface with its tail up and its body down. It is in a pond, 20 yards by 10 yards with 200 other goldfish. What is the cure for this fish?**

I suggest that you destroy the fish as you would not want it to breed with the others as it could pass on any defect in its structure. No doubt the fish has a disordered swim bladder. This is in two parts and it appears that the rear half is larger than the front part which makes the fish keep on an uneven keel. It may be due to a chill or some internal complaint but such a fish especially among so many others is of no use at all. The fish may be the result of someone else having tried to cure the ailing fish which became the parent of your present goldfish. To destroy a fish just dash it smartly on a hard surface. It may seem cruel but this is much better than to allow the fish to live in misery and there is the possibility of it passing on its weakness to any progeny which may be produced.

# *Synodontis* CATFISH

by Ann Walker

MEMBERS of the family of Mochokidae, the genus *Synodontis* are natives of Africa, mainly south of the Sahara. They inhabit both flowing and still waters. Possessing a rounded adipose fin and a rather humped back, they have three pairs of barbels. The large outer pair of barbels resemble horns, while the inner two pairs are fringed. The top fork of the tail is usually larger than the lower.

A number of species have the extraordinary habit of swimming upside down. The main reason for this is that although equipped for feeding from the bottom, they also feed from the surface of the water. They prefer semi-darkness, and in the aquarium are most active in the evenings and early mornings. They are gregarious, and in the wild congregate in large shoals. The larger specimens are not suitable for the small aquarium. There are four species most usually seen in captivity.

*Synodontis nigriventris*—**The upside-down Catfish**

This is the smallest of the four reaching a length of only two and a half inches (6·4 cm.). It comes from Central Congo, and is the most well adapted of the four for swimming upside down.

The belly is dark brown to black, and the back is much paler in colour. This is just the opposite of 'normal' fish that swim the right way up. The fish spends so much of its time upside down that it has developed this camouflage as a means of defence. The body is blotched with patches of darker brown and the fins are flecked. The three pairs of barbels are striped with alternating dark and light bands.

In the aquarium *Synodontis nigriventis* feeds mainly on small aquatic animals, such as *daphnia* and *tubifex* although *algae* is an essential 'extra.'

*S. nigriventris*

Unfortunately the four species are often confused, I was sold two specimens of *S. nigriventris* which later turned out to be *S. nigrita*.

They are undemanding in their tank requirements, preferring a temperature of about 77-78°F. The aquarium should be well planted, and furnished with attractive groups of rocks to provide refuge from the light. The tank should be dimly lit, or lit only for short periods. If it is not possible to use a dim light, the light should be made 'streaky' by placing a divider between the tank and the source. The divider should have slits at varying distances to allow only small amounts of light to enter the tank.

This fish has been bred in captivity, and it is reported to lay its eggs in well-hidden places, such as the inside of a flower-pot.

*S. schall*

*Synodontis schall*

This is the largest of the four species, and it comes from the Nile, the Senegal, Lake Chad and other localities in Africa. It grows to about sixteen inches (40 cm.) and it is very drab in colouring.

Adults are uniform dark grey or brown, while immature specimens are olive to brown spotted with darker brown. Their undersides, unlike *S. nigriventris*, are lighter than their dorsal regions.

This fish was known to the ancient Egyptians and some of their paintings showing this fish are still surviving today.

*Synodontis schall* feeds mainly on insects that fall on the surface of the water, its upside-down posture helping in this endeavour.

Being of such a large size, only small specimens are suitable for the home aquarium. Tank requirements are the same as for *S. nigriventris*. Supplies of insects are necessary to maintain this fish in the peak of condition, although undoubtedly dried foods serve as a substitute.

*S. schall* has not, to my knowledge, been bred in captivity.

*Synodontis melanosticus*

This is the second largest species reaching a length of about 13 in. (32 cm.). It lives in lakes Tanganyika, Bangwulu and Mweru and in the Zambezi.

The body is pale brown underneath rising to dark brown on the back, the whole being covered with numerous black spots and patches. Extensions of the gills form distinctive spiked ruffs or shoulder flaps.

*S. melanosticus* feeds mainly on small aquatic animals found near to the river-bed, although it does on occasion rise to the surface for a morsel of food.

Like the other three species if prefers shady aquaria, well planted, and with plenty of places to hide from the light.

This species has not been bred in captivity.

*S. melanosticus*

*Synodontis nigrita*

This species attains a length of about 6½in. (17 cm.), and inhabits the White Nile, Senegal, Niger and Gambia rivers. The first spine of the dorsal fin is smooth. The young are coffee-brown in colour and flecked with large numbers of spots which sometimes join together to form stripes. The adults are grey-green in colour flecked with darker spots. The belly is paler than the dorsal surface, indicating that this species does not spend that much time swimming upside down.

*Synodontis nigrita* has not been bred in captivity.

Tank requirements are the same as for the other three species.

I have kept two specimens of this fish for about three years. They were both between 1½ in. and 2 in. in length when I purchased them, now one has grown rapidly to 6 in. long, while the other seems to have slowed down, and only attained 4½ in. They were bought as two specimens of *S. nigriventris*.

After inhabiting an 18 in. tank for about two years and growing to 3 in. they moved to a 2 ft. aquarium, where in three months the larger one grew another inch. Their final change of home was to my largest tank with the Tinfoil Barbs, the 3 ft. tank. They

*S. nigrita*

have been in this tank for about nine months, and their growth rate has been tremendous.

It became evident that they were not *S. nigriventris* when they passed the 3 in. mark. Upon reading my little black book, I came to the conclusion that they were, in fact, *Synodontis nigrita*. As for swimming upside down, they seemed to do this more often when they were younger. However, the larger one took to swimming upside down a short while ago in order to obtain some floating food pellets. He swam about at the top of the water in an upside-down position, chasing the pellets. When he succeeded in catching one, he sucked it in, returned to a 'right way up' position, and swam off behind some rocks to gorge himself.

The smaller catfish seemed uninterested in his friend's antics, and was content to wait for a pellet to fall to the bottom of the tank (which took a long while, owing to the large appetites of the Tinfoils).

Most of their day is spent hiding behind the rocks with the *Hypostomus* Catfish. There is just enough room for all three of them to hide in comfort. In the evenings they begin to comb the gravel for any morsel of food the Tinfoils may have mislaid.

They like, for a treat, *tubifex* worms, or cheese! The main problem is getting the food past the Tinfoil Barbs. This can usually be accomplished by offering them fairly large pieces of food, such as pool pellets, or ½ in. pieces of cheese. They gorge themselves on the large pieces of food, and ignore the small pieces of cheese, or *tubifex* worms, which gently fall to the bottom of the tank into the waiting mouths of the two catfish!

*Synodontis* catfish are very interesting to watch, especially on the occasions that they take to swimming upside down. They make an interesting addition to any aquarium.

*Synodontis nigriventris* is to be recommended for its small size, and the fact that it spends far more time upside down than the other three species.

Given the correct conditions, any of the four species mentioned could enhance your aquarium for many years to come. So, with that in mind, good luck with your *Synodontis* keeping!

good starting times so that hatching takes place so that the naulpii are available alive and kicking when required. Also remember that powerful filtration systems can clear the shrimp from an aquarium before much of it is eaten by the fishes, so it may be necessary to switch things off for a short period whilst feeding.

Aquarists who work away from home during the daytime, as I do, may find difficulty in providing enough feeds daily to their fry, and so some thought should be given to the idea of encouraging the fishes to feed at times more suited to the aquarist's spare time periods. In these days of expensive heating most fish-house owners will have efficient insulation, and as a consequence will probably have blocked out all natural light, especially in wintertime. Thus we have an excellent opportunity to alter our fishes' daytime—night-time cycle if we wish, or at least to provide artificial lighting when convenient, without suffering the interference of natural light.

An aquaintance of mine uses a completely reversed daytime-nighttime cycle with much success. He has a small fish-house crammed with aquaria which are all illuminated by fluorescent tubes. These are switched on in the evening and off in the early morning. This gives him more time with his fishes during their "daytime" period, and as an added bonus the radiated heat from the numerous lighting control units helps warm the room during the coldest hours. Of course in such a situation it is important to grow plants in the aquaria if the costs of such heavy lighting need to be recovered. The types of tube used are the "Warm-white" or the "Daylight", and the plant growth achieved is very good.

Not being fond of plants in growing-on tanks myself, because of my lack of success with them when planted in efficient biological filters, I have not chosen this system for my own use, but rather use a twin five-foot "Daylight" fluorescent unit along the centre of the room to light all the unplanted aquaria from a column source. This is far cheaper than individual lighting and provides enough light for the fishes' purposes and also for mine when I work in there. I also use a fifteen watt tungsten bulb as a night-light because it is unlikely that the fishes hardly ever experience long periods of complete darkness in the wild.

The fishes are given a heavy feed every morning with, say, boiled and crumbled liver which will drop to the bottom and will keep the fishes busy until the next feed in the early evening. They can be fed as often as is desired throughout the evening, and then a last feed is given late at night when the main lights are put off, as I find that they will keep feeding through the night under the low illumination provided by the night-light. As alternatives to the liver I often use chicken leg bones with meat scraps still attached, white worms in feeders or simply dropped in if the aquarium has a bare base section, cod roe, in fact anything which can be put in quickly in quantity and which will not pollute the water if not eaten immediately. Of course this kind of feeding must not be overdone and is best suited to uncomplicated aquaria where there are no rocks or plants to provide hiding places for large uneaten particles. It also seems to be an advantage to have the aquarium full of fishes, as a large volume which is only partially populated is not properly scoured by the fishes and again unwanted accumulations can occur. It is a mistake to use newly-hatched Brine Shrimp at all in large tanks unless very many fishes are present, as they become so easily dispersed by air streams that they may be lost before they are eaten. In a smaller container, such as a ten-gallon aquarium with perhaps a hundred fry present, the shrimp are kept bunched and are eaten very quickly.

I recently obtained a copy of the British Marine Aquarists Association's questionnaire concerned with the breeding of marine fishes and invertebrates in captivity. This a very carefully thought out document which if properly used should enable the B.M.A.A. to compile some extremely useful information. I have no idea whether there has been any response so far but it is to be hoped that aquarists will co-operate and will encourage the Association in this fine idea. The breakthrough in breeding marines can reasonably be expected to occur in the forseeable future now that many serious aquarists are making determined efforts in that direction, so it is to be hoped that whoever does prove fortunate will share his experiences through such a medium as this.

The big drawback at the moment in breeding marines seems to be in the provision of suitable first foods for the fry of those species which will already produce spawn in aquaria. It seems to be reasonably easy to obtain eggs and fry of certain species, but practically impossible to feed and raise any quantity of young. A further difficulty is that many marine species apparently eat their young on hatching, even after guarding and cleaning the eggs, and presumably this is because the young are not swept away from the parents by water currents in an aquarium as they might be in their natural habitat. The B.M.A.A. will obviously publish its collected information eventually and this should give interested parties a useful background of information on which to base proposed breeding exercises. The questionnaire is available from Mr. G. C. Robertson, 88 Cornhill Rd., Aberdeen, AB2 5DH.

I would like to recommend two items of reading matter. First a little booklet entitled "Marine Aquariums in the Research Laboratory", written by John M. King and Stephen Spotte, and published by Aquarium Systems Inc. It was published in January 1974, and should interest readers of Stephen Spotte's previous larger books in that it gives various useful

modifications to his earlier proposals. For instance, his much-quoted recommendation that biological filter beds do not gain in efficiency when the bed depth is deeper than three inches (using 2 mm.-5 mm. particle size), is now questioned and it seems that performance may now increase with depth after all. Certainly this booklet should be read by serious followers of the practices of closed system water management. Being a scientific booklet, various tests and tables are given which are not always available to the hobbyist elsewhere.

Secondly, for anyone who was interested by my description of the closed-system fish culture unit in use at the University of Aston in Birmingham, in last month's column, I have since obtained a copy of a scientific paper entitled "Intensified fish culture combining water reconditioning with pollution abatement" by Dr. Paul B. Liao and Ronald D. Mayo, both of Kramer, Chin and Mayo Inc., Consulting Engineers, Seattle, Washington, U.S.A. The paper describes similar systems in detail and gives various useful parameters and formulae.

# FOR THE HERPETOLOGIST'S BOOKSHELF

*by Andrew Allen*

PROGRESSING from simple introductory books, we come to works aimed at the knowledgeable layman. Emphasis is still upon general biological principles rather than mere cataloguing of species. With two exceptions the field is devoid of authoritative contemporary writing.

A passable account is INTRODUCTION TO HERPETOLOGY by C. J. and O. B. Goin, Freeman Press 1962 and 2nd edition 1971. For, despite the title, this book demands more effort than any that I reviewed last time, and assumes some biological background. It is directed principally towards American students in first year college courses, but could prove useful to a wider readership. Compact design and simple prose, marred admittedly by a staccato style, contrast with the average wordy jargonistic American textbook. Chapters cover structure, evolution, life history, adaptation, distribution, and characters of the major groups, always treated from the viewpoint of the general biologist.

However, the superficial treatment of behaviour and population biology leaves much to be desired; these topics are crucial in any modern introduction to herpetological thought. And the attempt to consider Reptiles and Amphibians in a single rounded account falls into several of the waiting traps; lumping both classes into a single discipline, 'Herpetology', is solely a product of history and convenience, should not obscure important differences between the groups. Living Reptiles and Amphibians are probably not more closely related to one another, ecologically or phylogenetically, than are Amphibia to certain living fish or Reptilia (excluding the tortoises) to birds. But that argument must be pursued another time.

Weighing these pros and cons, I suggest that Introduction to Herpetology merits a careful read as a good overview, but boasts neither the authority, the presentation nor the prose to deserve a place on the bookshelf.

A step upwards in rigour brings us to that perennial classic THE BIOLOGY OF THE AMPHIBIA by G. K. Noble, first published 1931 but variously reprinted and re-edited since. The author was one of America's finest herpetologists, and his book remained . . . THE WORK . . . for three decades. It reflects the standards of scrupulous exactitude to be found in his detailed papers. Compact, and crammed with information, the approach falls just short of the advanced and this book should be comprehensible to all but the newest biological novice.

Anatomy and old-style physiology receive detailed and critical attention, while the younger disciplines of behaviour and ecology are scantily represented. The years pass relentlessly by, rendering much of the information obsolete and cruelly highlighting inequalities in coverage. Tiny but faultless drawings test the eyes, while Noble in his prose makes few concessions to gentle after-dinner readability. This is no companion to the vigorous theories of herpetology in the 70's.

It could also prove difficult to obtain. Few bookshops or libraries possess copies. But keep an eye on the second-hand shelves, and remember that several university libraries stock the book so that it should be accessible through inter-library loan. Yes, it has been superseded. But try and look at a copy and appreciate the high standards of herpetological writing that it sets.

Next time I shall discuss two more books in this field, both offering excellent contemporary accounts and, unlike today's pair, well worth purchasing for a place on the modern bookshelf.

# News from AQUARISTS' SOCIETIES

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

SOME new members were welcomed at the **Bournemouth A.S.** December meeting. During the evening there was a Twenty Questions Quiz and a crazy fish Quiz. The Table Show Results were: Barbs: 1 and 2, Mr. Chatfield; 3, Mrs. Bebb. Catfish and Loach: 1 and 3, Mrs Bebb; 2, Mr. Middleton. Cichlid: 1, 2 and 3, Mrs. Bebb. O.B. Pairs: 1 and 2, Mrs. Bebb; 3, Mr. Devlin. Tropical Breeders: 1 and 2, Mrs. Bebb; 3, Mr. Black. A.O.V. Tropical: 1, Mr. Chatfield; 2, K. S. Gibbs; 3, Mrs. Bebb.

* * *

TABLE Show results at the December meeting of the **Llantwit Major A.S.** (C.N.A.A. F.B.A.S. affiliated) were as follow: A.O.V. Cichlids: 1, J. Thompson; 2, and 4, G. Fry; 3, Master John Edwards. A.O.V.K.O.: 1 and 2, G. Lewis; 3, J. Thompson; 4, Master John Edwards.

The results of the Miles Thomas Cup awarded annually were: G. Lewis, 15 pts; J. Thompson, 14 pts.; H. Chick 14 pts.; A. Ibbertson, 9 pts.

Whilst the judging was in progress members were entertained with an F.B.A.S. tape slide lecture by D. Lambourne on catfish which proved to be extremely interesting. The standard of tape and slides, are to be recommended to any society who may require an interesting evening.

It was with regret that the meeting heard that the chairman, R. S. Wigg, would be unable to continue as chairman, a post he has held since the club was formed in July, 1953, for many years he was secretary, treasurer and show secretary combined, and he more than any other single member has been responsible for the Society's continued existence and expansion.

* * *

SEVERAL important decisions were taken at the November meeting of the **New Forest A.S.** (Affiliated to F.B.A.S.). One was that owing to increasing cost of Room Hire, Colour Slides etc., it would be necessary to increase the yearly subscription from the next Annual General Meeting. Several useful items were auctioned during the interval, also a raffle was organised to assist the Club funds. It was announced that the Annual Home Furnished Aquaria Competition will be held in February. Table Show results were: Platy: 1, 2 and 4, J. Jeffery; 3, R. Travers. Barbs: 1, M. Aust; 2, 3 and 4, T. & C. Barnes.

At the December meeting a colour slide quiz was given by Ron Matley of the Bournemouth A.S. and gave much interest to members. It was felt they learned many new fish names. It was decided that the society take part in a Inter-Club Table Show to be run by Salisbury A.S. on 6 April. Table show results were as follow: Mollies: 1, J. Jeffery; Corydoras Catfish: 1, 2 and 3, J. Jeffery; 4, M. Aust.

* * *

A NEW league has been formed in Yorkshire and will be called the **Statesmans League**, owing its name to Mr. and Mrs. B. Stabler who presented the league with the major trophy. The League consists of the following societies: Bridlington, Goole, York, York Ilboracum and Hull, with others interested. The Christmas Social evening and prize presentation was held at Beverley and was a tremendous success, with strong representation from all societies.

Statesman League results: Livebearers: G. Andrews (Hull). Barbs: Mr. and Mrs. Shipley (Goole). Characins: Mr. and Mrs. Scarll (Goole). Ras Dana Minn: M. Drysdale (Brid.). Fighters: M. Jordan (Brid.). Cichlids: L Taylor (Brid.). Anabantids: M. Jordan (Brid.). Cats and Loaches: Mr. and Mrs. Shipley (Goole). E.L.T.C.: R. Willerton (Hull). A.O.V.: T. Douglas (Hull). Sharks and Foxes: Mr. Darragh (Goole). and Mrs. A. Hagyard (Hull), joint. Breeders Egglayers: R. Willerton (Hull). Breeders Livebearers: G. Andrews (Hull). Pairs, Egglayers: R. Willerton (Hull). Pairs, Livebearers: Mr. and Mrs. Scarll (Goole). Coldwater: Mr. and Mrs. Carey (York). A.V. Female: Mr. and Mrs. Scarll (Goole). Best in Show: T. Douglas (Hull) and P. Carey (York). Statesman's Trophy for society with most points: Hull.

* * *

THE **Hull A.S.** results were: Senior Aquarist of Year: A. Frisby (first year as exhibitor). Junior Aquarist of Year: K. Douglas. Fish of the Year: G. Andrews. Furnished Aquaria: Mrs. A. Hagyard. Table Breeders: R. Willerton. Member with most points club shows: R. Willerton.

* * *

ENTRIES for the **Bradford & District A.S.** annual open show were a record, the final total being 505. Results: Section 1. Guppies: 1, Mr. and Mrs. Baldwin (Scunthorpe); 2, Mr. and Mrs. Houton (Sandgrounders); 3, N. Blenkin (Bridlington). Sweedtails: 1, Mr. and Mrs. King (Doncaster); 2, G. Allen (South Humberside); 3, Mr. Evason (Sandgrounders). Platies: 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, C. P. and S. Norton (Sandgrounders). Mollies: 1, G. Brown (Northumbria); 2, Master Hodge (Sandgrounders); 3, S. Hooton (Sandgrounders). A.O.V. Livebearers: 1, J. A. Whiteley (Alreborough) (section winner); 2 and 3, K. Douglas (Hull). Section 2. Barbs (up to and including Rosy Barb): 1, J. S. Hall (Aireborough); 2, Mr. and Mrs. Norton (South Humberside); 3, C. P. and S. Norton (Sandgrounders). Large Barbs (over Rosy Barb): 1, Mr. and Mrs. Riley (Leeds G.P.O.) (section winner); 2, Mr. and Mrs. Rawlings (Castleford); 3, L. Glover (Castleford). Section 3. Characins (up to Bleeding Heart Tetra): 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. and Mrs. Copley (Doncaster). Characins (over Bleeding Heart Tetra): 1, A. Frisby (Hull); 2, Mr. and Mrs. Baldwin (Sandgrounders); 3, S. Hooton (Sandgrounders). Section 4. Carps and Minnows: 1, C. P. and S. Norton (Sandgrounders); 2, Mr. and Mrs. Copley (Doncaster); 3, Mr. and Mrs. Green (Castleford). Sharks and Flying Fox: 1, Miss S. Clarke (Aireborough) (section winner); 2, Mrs. P. Hislop (Swillington); 3, D. Sugden (Bradford). Section 5. Killiefish: 1, A. Horsman (section winner); 2, Mr. and Mrs. Richardson (Scarborough); 3, Mr. Reid (Worksop). Section 6. Fighters: 1, D. and M. Laycock (Sheaf Valley); 2, and 3, L. Smith (Castlefoed). A.O.V. Anabantids: 1, Mr. and Mrs. Simpson (Worksop) (section winner); 2, P. Hislop (Swillington); 3, Mr. and Mrs. Emmerson (Castleford). Section 7. Dwarf Cichlids (up to and including Kribensis): 1, Mr. and Mrs. Tyson (South Humberside); 2 and 3, Mr. and Mrs. Holmes (Castleford); Large Cichlids (over Kribensis): 1, Mr. and Mrs. Fletcher (Doncaster) (section winner); 2, S. Wolstenholme (Heywood); 3, J. S. Hall (Aireborough). Angel Fish: 1, N. Blenkin (Bridlington); 2 and 3, D. Gregson (Blackburn). Section 8. Class R, Corydoras and Brocius Catfish: 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Fletcher (Doncaster); 3, Mr. and Mrs. G. Band (Sandgrounders). Class S, Loaches and Botia: 1, Mr. and Mrs. Binns (Scunthorpe); 2, Mr. and Mrs. Daines (Doncaster); 3, Mr. and Mrs. G. Muckle (Sandgrounders). Class T, A.O.V. Catfish: 1, J. Robertson (Northumbrian) (section winner); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs Copley (Doncaster). Section 9. Class U, A.O.V. Tropicals: 1, Mr. and Mrs. Copley (Doncaster) (section winner); 2, Mr. and Mrs. Caldow (Scunthorpe Museum); 3, Lynn Reid (Worksop). Section 10. Class V, Breeders Livebearers (1-10): 1, Mr. and Mrs. Kilvington (Doncaster) (section winner); 2, J. S. Hall (Aireborough); 3, D. and P. Birdsall (Aireborough). Class W, Breeders Livebearers (11-20): 1 and 2, Mr. and Mrs. Kilvington (Doncaster). Best in Show: J. Robertson, A.O.V. Catfish.

* * *

ONCE again there was a record number of entries for the **Ilford & District Aquarists' & Poondkeepers' Society** annual show. The class winners were as follow: Individual Furnished Aquaria: 1, D. Seaman; 2, H. Berger; 3, M. Shadrack; 4, R. Ruth. A.V.Barbs: 1 and 2, Mrs B.Oakley; 3, R. Ruth; 4, T. Robinson. A.V. Characin: 1, D. Oakley, 2, and 4, Mrs B. Oakley; 3, J. Rendol. A.V.Cichlid: 1, J. Rendol; 2, J. Rainbird; 3, D. Oakley; 4, P. Barham. A.V. Labyrinth: 1, M. Shadrack, 2, J. Rainbird; 3, Mrs S. Risk; 4, D. Knopp. A.V. Catfish: 1, D. Oakley; 2, J. Rainbird; 3, Mrs B. Oakley; 4, M. Shadrack. W.C.M.M. Danios: 1, Mrs. P. Read; 2, D. Oakley; 3, Mrs. B. Oakley. A.V. Rasboras: 1 and 2, Mrs. P. Read; 3 and 4, T. Robinson. A.V. Loaches: 1 and 4, R. Ruth; 2 and 3, W. Rowe. Breeders Livebearer Team: 1, J. Rainbird; 2, C. Lomas; 3, M. Shadrack; 4, G. Pearson; Breeders Egglayer Team: 1, D. Oakley; 2, D. Seaman; 3 and 4, M. Shadrack. A.V. Mollies: 1 and 2, C. Hackshall; 3, and 4, P. Horley. A.V. Sweedtail: 1, R. Ruth; 2, D. Seaman; 3, D. Knopp; 4, D. Oakley. A.V. Platy: 1 and 2, R. Ruth; 3, G. Crosby; 4, D. Seaman. A.V. Male Guppy: 1, C. Irish; 2 and 3, C. Hackshall; 4, G. Crosby. A.V. Female Guppy: 1, C. Hackshall; 2, G. Pearson; 3, W. Hart; 4, M. Shadrack. A.V. Singletail Goldfish: 1 and 2, M. Shadrack; 3, H. Berger; 4, P. Davidson. A.V. Twintail Goldfish: 1, G. Pearson; 2 and 3, H. Berger. A.O.V. Coldwater Fish: 1 and 4, A. Wright; 2, P. Davidson; 3, P. Hoeley. A.O.V. Tropical Fish: 1 and 4, Mrs P. Read; 2, D. Oakley; 3, Mrs B. Oakley. Tropical Plant: 1 and 4, M. Shadrack; 2, D. Seaman; 3, Mrs. P. Read. Coldwater Plant: 1 and 3, H. Berger; 2, W. Rowe; 4, M. Shadrack. Breeders (Pairs): 1, Mrs. P. Read; 2, D. Oakley; 3 and 4, M. Shadrack.

* * *

CHANGES of officers for this year in the **High Wycombe A.S.** were chairman, R. Leslie; vice-chairman, J. Pierce; the Secretary is still J. Bushby, 3 Hawthorne Walk, Hazlemere, Bucks. Tel. Penn 3825. Publicity Officer, S. Friend, 55, Cambridge Crescent, High Wycombe, Bucks.

The society meet every other Thursday at The White Horse Inn, West Wycombe Rd. (corner of Oakridge Rd.), High Wycombe. Visitors are welcome to come along to the meetings: for further details please contact the secretary. The table show trophy was won by A. Hall.

The open show for this year will incorporate the Three Counties Trophies and commemorate the 21st anniversary of the Three Counties. The society is now open to junior members age 14 and over on recommendation of any club member.

* * *

THE annual dinner dance of the **Hounslow & District A.S.** was held recently when the highlight of the evening was a presentation by Mr. A. Pratt of this year's trophies. Winners were as follow: Coldwater: 1, H. Pratt. Cichlids: 1, 2 and 3, M. Alexander. Pairs:

1 and 3, R. Pook; 2, D. Brooks. Corydoras: 1 and 3, M. Alexander; 2, R. Hart. Killies: 1, D. Brooks; 2 and 3, M. Collins. A.O.S. Livebearers: A. Rowe; 2, M. Alexander; 3, R. Hart. Sweeds & Platies: 1, J. Curtis; 2, R. Hart; 3, E. Sheppard. Labyrinths: 1, E. Sheppard; 2, J. Curtis. Characins: 1 and 2, R. Pook; 3, M. Alexander. Danios Rasboras, Minnows: 1, R. Piggott; 2, E. Sheppard; 3, M. Alexander. Breeders Egg-layers: 1, M. Collins. Breeders Livebearers: 1 and 2, H. Pratt. A.O.S.: 1, J. Curtis; 2, Sean Ward. Barbs: 1, H. Pratt; 2 and 3, R. Pook. Cats and Loaches: 1, Eric Best; 2 and 3, R. Hart. Furnished Jars: 1, R. S. Hart. Plants: A. Constantine. Home Furnished Aquaria: E. Sheppard. Junior H.P.A.: G. Wright. Best Fish of Year: M. Alexander. Breeder of Year: M. Collins. Open Show Trophy: Mrs. S. Parrish. Highest Points: M. Alexander. Junior Highest Points: Sean Ward.

* * *

THIRTY members of the **Gloucester A.S.** enjoyed an interesting evening with a lecture given by Mr. B. James on Tropical Plants. The business discussed comprised of the trophies which have arrived to be presented for each monthly table show, with a large trophy to be awarded to the member who wins the most table shows in the next year. It was agreed a ticket raffle will be organised this year in aid of the open show which is to be held in May.

* * *

OFFICERS elected at the Annual General Meeting of the **East London Aquarist and Pondkeepers Association** were as follow: President, P. Campkin; vice-presidents, F. Arnold, A. Field, J. Brydon, Mr. Petto, Mr. Taylor; auditors, Mr. & Mrs. F. Arnold; chairman, K. Wrightson; vice-chairman, K. Priest; general secretary, Mrs. P. Harris; treasurer, A. Harris; social secretary, J. Boss; programme secretary, B. Corby; editor, C. Ball; show secretary, M. Pearson; show organiser, L. Baker; Library, C. Sweeting; equipment officer, B. Argent; press officer, D. Flack; Lay members, B. Carter, J. London.

Any correspondence for this society should be sent to Mrs. P. Harris, 86 Leigh Rad. East Ham E.6. A full and varied programme has been arranged for the forthcoming year and any new members will be made most welcome.

* * *

OFFICIALS elected at the annual general meeting of the **Bristol Tropical Fish Club** were as follow: chairman, L. Littleton; vice-chairman, R. Toone; club secretary, Mrs Littleton; assistant secretary, Mrs. B. Peterson; treasurer, R. Lawrence; programme secretary, Mrs. Hinge; reporting secretary, T. Coggins; librarian, Mr. Grahame; show committee, show manager: G. Stone; show secretary, T. Coggins.

* * *

THE newly elected committee at the annual general meeting of the **Village A.S.** was as follows: chairman: F. Ansell; secretary, G. Molineux; treasurer: B. Grieves; show secretary, B. Cross; committee member, J. Dobson.

* * *

THE main item at the monthly meeting of the **Mid-Sussex A.S.** was an inter-club contest judged by J. Stillwell who awarded the prizes as follows: 1, Tonbridge A.S. 730 pts; 2, Mid. Sussex, A.S., 7291 pts; 3, Redhill & Reigate A.S., 704 pts; 4, Southern Ind. A.S., 625 pts; 5, Brighton & Southern A.S., 580 pts; 6 Crawley A.S., 489 pts. During the evening Mr. Soper the chairman showed some of his slides of his recent visit to Singapore. Any further information may be obtained from the secretary J. Reeves 36, Rumbolds Lane. H. Heath 3702.

* * *

THE Fish of the Year was the show judged by Mr. P. Ginger (F.B.A.S.) at the monthly meeting of **Brighton & Southern A.S.** There were more than twenty fish on the bench which pleased the Show Secretary Mrs. Feek as she has spent the last year encouraging members to bring their fish along. The chairman, Mr. R. Rice, organised a competition during the evening, which proved to be very entertaining.

Any further information may be obtained from the secretary S. Feek, 55 Newmarket Rd., Brighton.

* * *

THE improved heating facilities and revised layout of **The Fur, Feather & Aquaria Show** was thought to be the reason for the increase in entries. This show is organised by the Hackney Borough Council in conjunction with The Essex, North and East London Aquarist Association (F.B.A.S.). Full results are as follow: Club Furnished: 1, Bethnal Green (A. Kuderovitch); 2, Enfield (D. Watts); 3, Chingford (D. P. Ingle); 4, Walthamstow (R. Baulsom). Individual: 1, G. Dallanegra, (Bethnal Green); 2, Master S. Emptage (Walth); 3 and 4, Aquascape: W. Terris (Chingford). Mini Furnished: 1, Mr. & Mrs. Tolladay, (Chingford); 2, W. Terris (Chingford); 3, A. Kuderovitch (Bethnal Green); 4, R. Dale (Bethnal Green). Class B: 1, P. Coyle (Ind.); 2, G. Smith (Walth); 3, K. Waller (Bethnal Green); 4, C. Wood (N. Kent). Class C: 1, P. Coyle (Ind.); 2, K. Adams (Southend); 3, T. Woolley (Saracens); 4, J. Brown (Croydon). Class Ca: 1, Rhonda Coyle (Ind.); 2, A. Chandler (Walth); 3, Mr. & Mrs. Tolladay (Chingford); 4, G. R. Brett (N. Kent). Class Db: 1, May Nethersell (Riverside); 2 and 3, R. Thoday (Dunmow); 4, K. Adams (Southend). Class Db: 1, J. Brown (Croydon); 2, T. Woolley (Saracens); 3 and 4, Fran Rogers (Bethnal Green). Class E: 1, A. Chandler (Walth); 2, R. Bowes (Ind.); 3, K. Adams (Southend); 4, Fran Rogers (Bethnal Green). Class Ea: 1 and 4, W. Terris (Chingford); 2, C. Breitkreutz (Suffolk); 3, R. Bowes (Ind.). Class F: 1, V. C. Green (Suffolk); 2, 3 and 4, Mr. & Mrs. C. Thomas (Walth). Class G: 1, D. Lambourne (Riverside); 2, Mr. & Mrs. Tilley (Saracens); 3, A. Haley (Bethnal Green); 4, R. Bowes (Ind.). Class H: 1, Sybil Hedges (Bethnal Green); 2, P. Cottle (N. Kent); 3, Fran Rogers (Bethnal Green); 4, A. V. Wakenell (Romford & Becontree). Class J: 1, G. Smith (Walthamstow); 2 and 4, C. Cheswright (Southend); 3, R. Thoday (Dunmow). Class K: 1, Mr. & Mrs. Tolladay (Chingford); 2, Doris Winder (E. Dulwich); 3, A. Coyle (Ind.); 4, Mr. & Mrs. B. Fry (N. Kent). Class M: 1, Sybil Hedges (Bethnal Green); 2, J. Brown (Croydon); 3, R. Thoday (Dunmow); 4, J. London (Thurrock). Class N: 1, G. Smith (Walthamstow); 2, P. Cottle, (N. Kent); 3, R. Dales (Bethnal Green); 4, Mr. & Mrs. Tilley (Saracens). Class O: 1, G. R. Brett (N. Kent); 2, K. Adams (Southend); 3 & 4, A. E. Noronha (Orpington). Class P: 1, A. E. Noronha (Orpington); 2 and 4, T. Woolley (Saracens); 3, Mr. & Mrs. B. Fry (N. Kent). Class Q: 1, 3 and 4, A. V. Wakenell (Rom. & Bec.); 2, R. Dale (Bethnal Green). Class R: 1 and 4, G. Smith, (Walthamstow); 2, Doris Winder (E. Dulwich); 3, T. Woolley (Saracens). Class S: 1 and 3, W. Terris (Chingford); 2, C. Breitkreutz, (Suffolk); 4, J. London (Thurrock). Class T: 1, 3 and 4, D. Cheswright (Southend); 2, A. Chandler (Walthamstow). Class Ua-b: 1, and 2, Sybil Hedges (Bethnal Green) 3, K. Adams (Southend); 4, Mr. & Mrs. B. Fry (N. Kent). Class Uc-d: 1, H. Berger (Ilford); 2, Mr. & Mrs. B. Fry; 3, and 4, Z. Bullock (Bethnal Green). Class Va-g: 1 and 4, H. Berger (Ilford); 2 and 3, A. Bullock (Bethnal Green). Class Vh-l: 1 and 2, Miss R. Berger (Ilford). Class W: 1 and 4, B. Peacock; 2, G. Brett (N. Kent); 3, Sybil Hedges (Bethnal Green). Class Xb-m: 1, C. Breitkreutz (Suffolk); 2, B. Baulsom (Walthamstow); 3, V. C. Green (Suffolk); 4, Mr. & Mrs. Tilley (Saracens). Class Xo-t: 1, G. Smith (Walthamstow); 2, A. E. Noronha (Orpington); 3, B. Baulsom (Walthamstow); 4, D. Cheswright (Southend). Class Xu-w: 1 and 4, Mrs. K. Woolley (Saracens); 2 and 3, Mr. & Mrs. Woodward (N. Kent). Class Z: 1, D. Cheswright (Southend); 2, R. Dale (Bethnal Green); 3 and 4, A. Chandler (Walthamstow). Inter-club trophy was won by Bethnal Green A.S. and Best Fish in show a Microglanis Ater owned by D. Lambourne. The F.B.A.S. Trophy for egglaying toothcarps went to V. C. Green. Best Coldwater fish was a London Shubunkin owned by Sybil Hedges. Best Breeders entry, was won by G. Smith with a team of Platy Variatus.

* * *

PRESENTATION of the year's awards was made at the annual dinner and dance of the **Northwhich & District A.S.** The awards were as follow: Aquarist of the Year 'Cook Trophy': 1, L. & D. Thorne, 2, D. & M. Valentine; 3, L. Bradley. Member of the Year: 1, L. Rimmer; 2, L. Thorne; 3, D. Valentine.

At the annual general meeting the following committee were elected for this year: chairman: P. Hyland; show chairman, L. Thorne; show secretary, N. Thompson; Asst. show secretary, D. Valentine; social secretary, B. Connolly; P.R.O., H. Buckley; Librarian, A. Myers; treasurer, S. Yates; secretary, L. Bradley, 4 Ash Road, Sandiway, Northwich. Judges for breeders award scheme, L. Thorne, R. Antonio, J. Buckley, H. Buckley, T. Bailey, L. Bradley; Fish of the year trophy went to, 1, Paul Wrench 2 and 3, L. Thorne.

* * *

ENTRIES for the **Walthamstow & D.A.S.** Open Show totalled 679. The Best fish in show award went to C & K. Thomas of Walthamstow and the F.B.AS. trophy for Breeders Coldwater was won by Mrs. K. Wooley of Saracens A.S. The trophy for highest pointed society (W.D.A.S. excluded) was taken by Bethnal Green A.S. Full results were as follow: Aa/b: 1, Harlow A.S.; 2, Bethnal Green A.S.; 3, Walthamstow A.S.; 4, Saracens; Ag: 1, Mr. & Mrs Tolladay; 2, K. Lewis; 3, R. Hard; 4, W. Dale. Ak: 1, Mr. & Mrs. Salsbury; 2, S. Emptage; 3, D. North; 4, R. Burdett. B: 1, Mrs D. Cruickshank; 2, S. Cowell; 3, P. Coyle; 4, Mr. & Mrs. Oakley. Ca: 1, Miss R. Coyle; 2, G. Brett; 3, D. Ingles, 4, P. Moye. Cz: 1, R. Vandersteen; 2, J. Brown; 3, P. Coyle; 4, P. Roberts. Db: 1, J. Brown; 2, Mr. & Mrs Oakley; 3, R. Vandersteen; 4, P. Moye. Dz: 1, Mr. & Mrs. Hubert; 2, Mrs. M. Nethersell; 3, R. Thoday; 4, P. Roberts. Ea: 1, A. Thacker; 2 and 3, W. Terris; 4, P. Garner. Ez: Miss P. Rogers; 2, D. Shea; 3, A. Chandler; 4, T. Wooley. F: 1, 2 and 3, C. & K. Thomas; 4, P. Roberts. G: 1, Mrs. M. Nethersell; 2, Mrs. S. Hedges; 3, S. Adams; 4, T. Wooley. H: 1, Mrs. S. Hedges; 2, P. Moye; 3, Mrs. M Nethersell; 4, C. Kislingbury. J: 1, C. Kislingbury; 2, B. Mason; 3, Master C. Cheswright. K: 1 and 2, P. Moye; 3, T. Howles; 4, J. Connolly. L: 1, A. Feast; 2, Master T. Coyle; 3, D. Winter; 4, Mr. & Mrs. B. Fry. M: 1, Mrs. S. Hedges; 2, D. G. Wood; 3, R. Thoday; 4, J. Brown. N: 1, M. G. Smith; 2, S. Adams; 3, T. Macdonald; 4, J. Preston. O: 1, C. Kislingbury; 2, M. Bradford; 3, Mrs. M. Nethersell; 4, G. Brett. P: 1, C. Kislingbury; 2, Mr. & Mrs. Fry; 3, A. Noronha; 4, P. Moye. Q: 1, 2 and 3, J. Preston; 4, S. Jordon. R: 1 and 2, M. G. Smith; 3, B. Mason; 4, Miss M. Wood. S: 1 and 4, Mrs. M. Nethersell; 2, P. Roberts, 3, W. Terris. T: 1 and 2, D. Cheswright; 3, Mrs. D. Cruickshank; 4, D. Wood. U: 1 and 2, Mrs. S. Hedges; 3, R. Elsdon; 4, B. Cook. V: 1, B. Cook; 2 and 4, T. Bullock; 3, R. Elsdon. W: 1, Mrs. S. Hedges; 2, D. Goodbody; 3 and 4, B. Peacock. Xb-m: 1, J. Boss; 2, P. Moye; 3, Mrs. K. Wooley; 4, E. Bartlett. Xo-t: 1, M. G. Smith; 2, D. Cheswright; 3 and 4, A. Noronha. Xv-w: 1, Mrs. K. Wooley; 2 & 4, W. Woodland; 3, B. Cook. Z: 1, 3 and 4; A. Chandler; 2, M. G. Smith.

* * *

THE **Yeovil & District A.S.** is again intending to repeat last years highly successful film show on Wednesday 5th March. As last year the society would like to invite any aquarist who wishes to attend. The date fixed for the eighth annual open show Sunday is the 11th May. The venue has yet to be decided. The society is now recruiting new members and would like

to draw attention to the meetings which are held at 7.30 p.m. on the first Wednesday of each month at 'The Moose Centre', St. Michaels Avenue, Yeovil. The address and telephone number of the secretary is Mr. P. C. New, 8 Mayfield Road, Yeovil, Somerset, Tel. Yeovil 24225.

* * *

RESULTS of the **South Humberside A. S.** Inter-Club show with Immingham were: Livebearers (pairs): 1, Mrs. & Mrs. Kirk; 2, Mr. & Mrs. Norton; 3, G. Allen. Egglayers (Pairs): 1, Mr. & Mrs. Tyson; 2, Mrs. Clayton (Imm.), 3. A. Smith (Imm.). Small Barbs: 1 and 3, Mr. & Mrs. Norton; 2, F. Watts. Small Characins: 1, Mr. Watts; 2, Mr. & Mrs. Lake; 3, D. Hill. Dwarf Cichlids: 1, Mr. & Mrs. Tyson. Guppies: 1, Mr. Edwards; 2, Mr. & Mrs. Searby; 3, Mr. Newson. Swordtails: 1, Mr. & Mrs. Kirk; 2, Mr. Clayton (Imm.); 3, Mrs. Johnson. Mollies: 1, Mr. & Mrs. Norton; 2 and 3, Mr. & Mrs. Kirk. Danios & Rasboras: 1, Mr. & Mrs. Searby; 2, Mr. Bunce; 3, Mr. & Mrs. Tyson. A.V. Cats: 1, G. Allen; 2, Mr. Bingham (Imm.); 3, R. Smith (Imm.). Anabantids Fighters: 1 and 3, Mr. & Mrs. Kirk; 2, Mr. & Mrs. Norton. Large Cichlids: 1 and 2, Mr. & Mrs. Tyson; 3, G. Allen. Angels: 1, Mr. & Mrs. Kirk; 2, Mr. & Mrs. Newson; 3, Mr. Bromely. Best Fish in Show Mr. & Mrs. Tyson, (S. Humberside).

* * *

OFFICERS elected at the **Basingstoke & District A.S.** annual general meeting were as follow: president, A. Blake; vice-president, A. Marshal, committee; chairman, G. Clewer, vice-chairman, P. George; secretary, M. Strange; treasurer, G. Dixon; show manager, R. Onslow; show secretary, R. Rich; programme secretary, B. Bissoon; projects officer, R. Peck; secretary, Mrs. P. Dixon.

At the meeting Mr. P. Merritt of Reading & District A.S. gave an enlightening and interesting talk on 'Fish' in all its aspects and there were a number of questions from the floor. The society meets every Friday in the Moot St. Club, Basingstoke. All are welcome.

* * *

MEMBERS of the **Swillington A.S.** heard a very informative talk from Mr. G. Binks on home furnished aquaria recently. Results of this competition were: 1, C. Freeman; 2, Miss S. Myers; 3, B. Hamburg.

The fourth Quarterly Table Show placings were: A.O.V.: 1 and 2, J. Abbot; 3, B. Hamburg; Rasbora, Carps & Minnows: 1 and 2, Mrs. P. Hislop; 3, C. Freeman. Livebearer (Pairs): 1, Mrs. A. Hislop; 2, J. Parkin; 3, R. Jefferson. Egglayer (Pairs): 1, J. Abbot; 2, Mrs. A. Hislop; 3, Miss P. Hislop.

* * *

NEARLY all the members were present at the Annual General Meeting of the **Hounslow and District A.S.**

The new Committee members elected were as follow: chairman, R. Nelhams; secretary, H. Parrish; treasurer, Mrs. S. Parrish; show secretary, A. Constantine; newsletter editor, R. Scurry; Librarian, T. Bollingbrook; P.R. officer, H. Pratt; press secretary, Mrs. S. Winslade; floor members, Mrs. R. Brewer; R. Hart; E. Sheppard.

* * *

RECENTLY the **Gloucester Fishkeeping and Social Club** held their annual general meeting when the following members were elected: president, J. Wyatt; vice-presidents: Barrier Reef, B. Stoneham, T. Collier, M. Burke; chairman: T. Collier; secretary, Mrs. M. J. Mitchell; treasurer, Mrs. J. Viner; social secretary, T. Collier; show manager, N. Binding; table show manager, J. Bartlett. Committee members and social committee members were also elected.

This meeting was followed the next day by a presentation social and dance during which cups and trophies were presented to M. Burke and J. Bartlett as being first and second winners of the adult table show for the year, and to Master C. Dyke and Miss L. Toomey for being the winners of the junior table show. Cup Winners for cold water fish were, 1, F. Palfry; 2, Mrs. J. Mitchell; and the cup winner of the Champion of Champions table show was M. Burke. The club's Home Aquaria competition was won by T. Dimond, second place being awarded to J. Bartlett.

The Barrier Reef Home Aquaria competition, which was held in conjunction with local clubs, produced the following winners in the senior section: 1, T. Dimond; 2, P. Young; 3, Mr. & Mrs. J. Williams, all from the Gloucester area. Junior winners were: 1, Master M. Freshney, (Gloucester); 2, Master D. Taylor (Hereford); 3, Master Biggs (West Gloucester); 4, Master S. Mills (Gloucester). The November meeting of the club included a Bring and Buy sale and the table show was won by Mrs. J. Burke with J. Bartlett filling the next three places.

* * *

THE **Whiteway & D.F.S.** held their third annual show in November which proved a great success with 97 entries. The results were as follow: Guppy: 1, Miss T. Sullivan; 2, S. Daniels; 3 and 4, Master D. Sullivan. Swordtail: 1 and 4, S. Daniels; 2, D. Calley; 3, B. Coward. Platy: 1, S. Daniels; 2, Master D. Sullivan. Molly: 1, Miss T. Sullivan; 2, R. Fielding; 3, Master D. Sullivan; 4, S. Daniels. Specified Barb: 1, S. Daniels; 2, Master A. Davis. A.O.V. Barb: 1, D. Calley; 2, M. Bransgrove; 3, D. Galley; 4, S. Daniels. H. & H. Characin: 1, D. Bradley; 2, R. Fielding; 3, Master A. Davis; 4, S. Daniels. A.O.V. Characin: 1, M. Bransgrove; 2, D. Bradley; Siamese Fighter: 1, 2 and 4, G. Todd; 3, B. Coward. A.O.V. Anabantid: 1, S. Daniels; 2, D. Calley; 3, F. Bealing. Corydoras & Brochis: 1, S. Daniels. A.O.V. Catfish: 1, S. Daniels; 2, M. Bransgrove. Botia, Loach, Eel & Shark: 1, M. Bransgrove; 2, B. Coward; 3, C. Pawley. Rasbora, Danio & Minnow: 1, Master A. Davis; 2, M. Bransgrove. A.V. Cichlid excluding angel: 1, C. Pawley; 2, D. Calley; 3, S. Daniels; 4, F. Bealing. Angel: 1 and 2, F. Bealing; 3, D. Bradley; 4, Master A. Herrington. Shubunkin: 1 and 2, T. Fowler; 3, G. Jennings; 4, T. Morris-Davis. Single Tail Goldfish: 1, T. Morris-Davis; 2, S. Daniels. Twin Tail Goldfish: 1, 2 and 3, T. Morris-Davis; 4, G. Jennings. A.O.V. Tropical: 1, D. Calley. Junior Class any fish: 1, Miss K. Pawley; 2, Master A. Pawley; 3, Master M. Coward; 4, Miss K. Fielding. Awards of plaques were given for the following: Best tropical in show: C. Pawley. Best coldwater in show: T. Fowler. Best junior exhibit in show: Miss K. Pawley. Plaque for junior with highest number of points through the year, the winner was Master David Sullivan.

* * *

DETAILS of the election of officers at the annual general meeting of **Hendon & District A.S.** were: chairman, H. G. J. White; vice-chairman, K. L. Purbrick; secretary, Miss Y. Longuet, 2 Marsh Drive, Hendon, London, N.W.9. Assistant secretary, Mrs. H. C. Thompson; treasurer, J. Packham; show secretary, R. S. Thompson, (17 Highfield Avenue, Kingsbury, London, N.W.9 0.P.D.).

* * *

AN endeavour is being made by Peter Ireland to form Research Group Projects within the B.M.A.A. Basically individuals and groups are asked to undertake serious study into any of the many facets of Marine fishkeeping or marine aquarium technology. The findings of these groups will go to a central body to help peovide a better educational and advisory service to B.M.A.A. members and outside interests.

All interested persons and groups should, in the first place, contact Mr. Peter Ireland, 5, Sinclair Rd., Waltham Forest, London, E.4, for further information.

* * *

AUTUMN activities for **Bethnal Green A.S.** started with an entertaining evening at which R. Essen (F.B.A.S.) gave a talk with slides on Native and Foreign coldwater fishes. At the end of year 'Champion of Champions' table show held by the Catfish Association of G.B., Bethnal Green were successful in winning the two first places. Glass G was won by A. Haley and Class H by Sybil Hedges.

Bethnal Green were hosts in November for the final night of the Area Group table shows. B.G.A.S. earned 37 points that night and finished in first place. The club furnished and aquascape classes for the area group were held at the Fur, Feather and Aquaria show at which B.G.A.S. took first place in both classes. Club furnished was won by A. Kuderovitch and the aquascape class was won by Gino Dallanegra. The annual championship for the area group was won by Bethnal Green A.S.

* * *

AT the November meeting of the **Dorchester & District A.S.** the programme consisted of a talk given by Mr. Casey, from the Dorset River Authority, on water chemistry. This was followed by questions and general discussion which proved to be an eye-opener to many club members who discovered that local waters vary considerably within a twenty mile radius.

This month was 'Night of Champions' entry for the table show with the following result: 1, Mrs. I. Christopher; 2, P. Connors; 3, Mrs. J. Belt; 4, N. Derrick.

The Annual Dinner, which was held in November, proved to be the best ever. Presentation of the table show winners cups was given by the club chairman A. Cornick. The result was; Section 1, R. Christopher; Section 2, G. Fox; Juniors, Master Roy Christopher. Meetings are held on the second Thursday of the month at the Youth Centre in York Road. Any new members are most welcome.

* * *

APPROXIMATELY twenty members attended the November meeting of the **Gloucester A.S.** for a very good lecture and slide show which was given by Miss B. Ryan and the subject was "From the stream to the tank."

The business discussed comprised of the results of the inter club six a side in which the Gloucester A.S. came fourth with G. Dixon winning the shield for best Livebearer in the show. In addition the items discussed included the members' views who went on the Belle Vue, Manchester outing where all had an enjoyable and interesting day. The recent jumble sale proved to be very successful and profitable. Results of monthly table shows: Tetras: 1, J. Williams; 2, K. Taylor; 3, P. Timmins; 4, R. Jarvis.

* * *

THE **Didcot A.S.** annual general meeting was well supported by the members in November. During the election of officers Mr. J. Davidson, made a request to retire as Club Chairman, so that he could give his full attention in his new position as Chairman of the Three Counties. Mr. D. Whiting was elected as the new D.A.S. Chairman. Other officers appointed were as follow: treasurer, W. Geary; show secretary, A. Thimbleby; secretary, J. Wilson, Sower Hill Farm, Uffington Nr. Faringdon, Oxon, S.N.7 7Q.H. The society meet on the first and third Friday of the month at Esso Research, on the A34 just past Rowstock Crossroads. Visitors can be assured of a warm welcome at any time.

* * *

At the Annual General Meeting of **Sheaf Valley A.S.** the following committee was elected: chairman, F. Toyne; secretary, Mrs. M. Staniforth; treasurer, H. Darley; social secretary, Mrs. C. Toyne; editor, D. Staniforth; show secretary, P. Staniforth; assistant show secretary, D. Scott; committee member, A. Grafton.

* * *

THE convention date of the **Tyne-Tees Area Association of the F.B.A.S.** has been fixed for Sunday the 23 March at the Bay Hotel, Whitburn Tyne and Wear at 2 p.m.-9 p.m. Buffet meal, tickets £1.00. Speakers are Miss Turner (Hancock Museum Newcastle), Mr. G. Howes (Characins) (British Museum London), Mr. A. Charlton B.F.G.A. (Guppies). Mr. R. Eason G.S.G.B., and Mr. W. Pearson (water). Tickets can be obtained from Mr. G. T. Liddle,

2 Cromer Avenue, Gateshead NE9 6UJ, Tyne and Wear.

* * *

IN December, **Darfield & District A.S.** held their annual general meeting when the following officials were elected: chairman, B. Marshall; vice-chairman, Mrs. P. Singleton; secretary, R. Singleton; treasurer, R. Turner; show secretary, S. Burrows; committee, Mrs. P. Glew, A. Gleadeon, B. Lockwood, Juvenile member, Master D. Burrows. This was followed by a table show for A.O.V. the first three places being taken by T. Clewes. The shields for most points at table shows throughout the year were presented at the annual dinner and were won by T. Clewes, junior shield Miss Susan Glew and a good evening was enjoyed by the members and guests.

The Darfield & District A.S. is a strong new club entering its third year, with over 60 members, meetings are held the first Thursday of each month at The Village Club, Darfield, Nr. Barnsley and new members are welcome to attend.

* * *

AT the monthly meeting of the **Mid-Sussex A.S.**, Mr. Corbin gave a lecture on Catfish, which he accompanied with a slide show. He said that although catfish are good at 'cleaning-up' they should also be fed like any other fish. There was a competition of 10 in. × 8 in. × 8 in. aquaria which was judged by the members and first prize was awarded to the chairman Mr. David Soper. Any further information on the society may be obtained from the secretary Mr. John Reeves, 36 Rumbolds Lane, H. Heath.

* * *

OFFICERS of the **Independent A.S.** for this year are: chairman, R. Bowes; secretary, P. Coyle, 100 Salop Road, Walthamstow, London E.17 (01-521 0936); show secretary, T. Kinsey; treasurer, R. Bowes; assistant secretary, R. D'Arcy; assistant show secretary, J. Gamble; P.R.O., R. C. Burton.

* * *

MEMBERSHIP of the **Sandgrounders A.S.** more than doubled last year and the total membership now exceeds one hundred. Attendances at the fortnightly meetings have rarely fallen below seventy.

The table shows have been very well supported with both the senior and junior monthly plaques being fiercely contested. With the setting-up of four sections within the society, namely for showing, breeding, photography and tank maintenance, a great deal of interest and enthusiasm has been evident.

The Sandgrounders A.S. show team, organised by a keen and very capable show secretary in George Waterhouse, have led the Federation of Northern Aquarium Societies' show league since its inception last July. During Xmas, members of the photographic group were busy visiting members homes taking pictures for the home aquaria contest. It is hoped that this can be an annual event with a perpetual trophy for the winner.

The tank maintenance group was inaugurated with the donating of a furnished aquarium to the orphans of the National Children's Home in Park Crescent, Southport, during midsummer. Since then many tanks in schools, hospitals and dentists have received attention through the tank maintenance scheme.

Particulars of these activities or society meetings and membership may be obtained at any time from the honorary secretary, Steve Hooton, 81 Radnor Drive, Churchtown, Southport (Tel: 24743 0704).

* * *

IN December the **Hastings & St. Leonards A.S.'s** first meeting was devoted to a quiz between the men and the ladies. The quiz master was Mr. D. Cooper from Ringmer and the questions covered geographical habitats of fish, aquarium plants, and silhouettes of fish. The result was a win for the ladies by 34 pts. to 30 pts. At the next meeting Mr. Bernard Rye lectured on 'Aquarium Plants.' His subject matter was Cryptocorynes and Aponogetons but he also covered a number of other species. The table show judged by Anne Adams was for pairs, the placings being: 1, C. Waddell; 2, Mrs. J. French; 3, C. Christou.

* * *

ON Saturday 8 March the **British Aquarists Study Society** will be holding their first spring meeting at the Zoological Society, London Zoo. This will be a symposium on 'Diseases of fishes.' The main speaker will be Mr. Randolph Richards of Stirling University, Scotland. Tickets at £1.50 each (including tea) are available from Mr. F. Keens, Highcliffe, Old Hill, Woking, Surrey. The meeting will start at 2.30 p.m.

* * *

## CHANGES OF NAMES

In future the **Munster A.S.** will be known as the Munster Tropical Fish Society.

There have also been some changes within the committee, and these are as follow: chairman, F. Doyle; vice-chairman, F. Owens; treasurer, B. Farrell; secretary, E. O'Leary, 27 McDonagh Road, Lower Friars Walk, Cork; committee members: H. Keating, G. O'Leary and E. Russell. This committee is a caretaker committee, to run the society until the first annual general meeting in May. Meetings of the society take place in the Imperial Hotel, South Mall, Cork, on the third Monday of each month. All correspondence should be addressed to the Hon. Secretary at the above address.

* * *

THE **Haden A.S.** have now changed their name to the Halesowen A.S. The meeting place is the Royal British Legion, Otterbourne Court, Halesowen and the meetings are held every first Monday of the month at 8 p.m. The new committee is as follow: chairman, F. Swift; treasurer, D. Westhall; show secretary D. Clews; secretary, E. Poole, 251 Howley Grange Road, Halesowen, W. Midlands.

* * *

## SECRETARY CHANGES

**Sheaf Valley A.S.:** Mrs. M. Standforth, 47 Whitethorns Drive, Batemoor, Sheffield 8S8 8ET Yorkshire.

**Sheffield & District A.S.:** J. Blizzard, 62 Alnwick Road, Intake, Sheffield, S12 2GE.

**Catfish Association Great Britain:** Alan Haley, 255, Lewisham Way, London, SE4.

**Lincoln and District A.S.:** Mrs. S. Woodliffe, 36 Richmond Road, Lincoln.

**Southend, Leigh & District A.S.:** D.M. Chenwright, 2 Cedar Avenue, Wickford, Essex.

**Gainsborough A.S.:** A. Howitt, 22 Thurlby Road, Gainsborough, Lincs.

**Caterham Nomad A.S.:** D. Charles, 11 Homefield Road, Old Coulsdon, Surrey. Tel: Downland (Surrey) 51515.

* * *

## VENUE CHANGES

The **Sheaf Valley A.S.** is now holding its meetings fortnightly on Fridays at the Ball Inn Crookes, for further details phone Sheffield 662382.

The **Village A.S.** now meet at the Hesketh Hotel, Hulme Hall Road, Cheadle Hulme, Cheshire on the second Tuesday of each month.

Commencing January the **Independent A.S.** will meet at St. Stephens Church Hall, Copeland Road, Leyton, E.10 every other Thursday evening.

* * *

## AQUARIST CALENDAR

**9th February:** Sheaf Valley A.S. Open Show at Woodseats Jnr. School, Chesterfield Road, Sheffield. Show secretary, Mrs. Carol Toyne, 10 Barber Crescent, Sheffield. Tel: 662382.

**23rd February:** Retford and District A.S. First Open Show, Town Hall, Retford. Schedules from Show Secretary: B. D. Chester, 7 Rose Lea, Ordsall, Retford, Notts. Tel: Rampton 594.

**2nd March:** Keighley A.S. 7th Annual Open Show at the Leisure Centre, Victoria Park, Keighley. Benching 12—2 p.m.

**16th March:** Don Valley A.S. Open Show, Staff Dining Rooms, British Steel Corporation, Stockbridge, nr. Sheffield Works. Schedules from Show Secretary, Mrs. B. Hartley, 11 Hall Royd Walk, Silkstone Common, Barnsley.

**22nd March:** Goldfish Society of Great Britain (Annual General Meeting), Conway Hall, Red Lion Square, Holborn, London W.C.1.

**23rd March:** Worksop Aquarist & Zoological Society Annual Open Show Date at the North Notts College of Further Education, Blyth Road, Worksop, Notts. Schedule from show secretary, A. Mawson, 56 Waverley Way, Manton Worksop, Notts.

**23rd March:** Tyne-Tees Area Association of the F.B.A.S. Convention, Bay Hotel, Whitburn, Tyne & Wear, 2 p.m. Tickets £1.00. G. T. Liddle, 2 Cromer Avenue, Gateshead.

**30th March:** Sheffield & District A.S. Open Show at Granville College, Granville Road, Sheffield.

**31st March:** Southampton A.S. Open Show will be held at the Avenue Hall, The Avenue, Southampton. Schedules available from Mr. D. Mills, 30 Ferndene Way, Bitterne Park, Southampton.

**6th April:** Medway A.S. Annual Open Show. Further details later.

**6th April:** Heywood and District A.S. Open Show, Civic Hall, Church Street, Heywood, Lancs.

**13th April:** Nelson A.S. Annual Open Show, The Civic Centre, Stanley Street, Nelson. Details from: R. McKenna, 52 Bath Street, Nelson BB9 0NP, Lancs.

**13th April:** Warrington A.S. Seventh Annual Open Show, Parr Hall, Palmyra Square, Warrington. F.N.A.S. rules. Show secretary, Mr. J. Higham, 42 Hood Lane, Sankey, Warrington, Lancs WA5 1EJ. Phone: 36939.

**19th April:** Reigate & Redhill A.S. Open Show at Market Hall Buildings, Redhill, Surrey. Details from M. Sandford, 5 Victoria Road, Redhill, Surrey. Tel: Redhill 69339.

**19th April:** Yate & District A.S. 9th Open Show at King Edmunds School, Yate, Nr. Bristol. Show manager, Mr. C. Stickland, 20 Burgage Close, Chipping Sodbury, Bristol BS17 6DZ.

**19th April:** Corringham and District A.S. Annual Open Show. Further details to follow.

**20th April:** Coventry Pool and A.S. Open Show at Templars Junior School, Tile Hill Lane, Coventry. Show schedule (s.a.e.) from S. Wooldridge, 23 Lime Tree Avenue, Tile Hill, Coventry.

**20th April:** Merseyside A.S. Open Show, Rainhill Village Hall, Exchange Place, Rainhill, Lancs.

**20th April:** Stockton-on-Tees A.S. Open Show at St. Peter & Paul School, Durham Rd, Stockton (adjacent to the Mile House Hotel) details and schedules from the Show Secretary, C. W. Buck, 22 Danby Grove, Thornaby, Cleveland TS17 8BX. Telephone, Stockton 65284.

**27th April:** Loyne Aquarist Open Show at St. Paul's Hall, Scotforth, Lancaster.

**4th May:** Hull A.S. Open Show will be held at the Blind Institute, Beverley Road, Hull.

**10th May:** Southend, Leigh and District A.S. Open Show, St. Clements Hall, Leigh-on-Sea, Essex. Club Furnished, Individual Furnished, Aquascapes, Marine and Junior Classes included. Show Secretary: Derek Durrant, 172 Trinity Road, Southend-on-Sea, Essex. Tel: 610576.

**10th May:** Port Talbot A.S. Annual Open Show: Schedules available from Show Secretary, A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, Glam.

**11th May:** Yeovil & District A.S. Annual Open Show. School Hall Martock in Yeovil, Som.

**11th May:** Bournemouth A.S. Annual Open Show to be held at Kinson Community Centre, Pelhams Park, Kinson, Bournemouth. Show Secretary: J. V. Jeffrey, 30 Braemar Avenue, Southbourne, Bournemouth BH6 4JF.

**18th May:** Goole A.S. Open Show. Show Secretary, P. Shipley 76 Jefferson Street, Goole, N. Humberside DN14 6SJ.

**18th May:** Middleton and District A.S. Fourth Open Show will be held at Hollin High School, Hollin Lane, Middleton. Schedules later. Only members of recognised Aquarist Societies may exhibit. No independent entries can be accepted.

**24th May:** Goldfish Society of Great Britain, Conway Hall, Red Lion Square, Holborn, London W.C.1.

**25th May:** Corby and District A.S.: Open Show, Corby Civic Centre, Corby, Northants. Show Secretary, A. Slow, 176 King Street, Kettering, Northants NN16 8QS. (Details and Show Schedule Mid-March).

**1st June:** Newcastle Tropical F.S. Open Show will be held in St. John's Church Hall, Westgate Road and Grainger Street junction, Newcastle upon Tyne. Schedules will be available shortly from L. R. Lawson, 84 Grosvenor Road, Jesmond, Newcastle upon Tyne 2.

**8th June:** Sherwood A.S. Open Show to be held at Thoresby Miners Welfare Hall, Edwinstowe, Ollerton, Nr. Mansfield, Notts. Schedules from show secretary, Mr. J. Igoe, 25 Marples Avenue, Mansfield, Woodhouse, Notts. Tel: Mansfield 32249.

**14th June:** Llantwit Major A.S. (C.N.A.A./F.B.A.S.) Open Show to be held at the Town Hall, Llantwit Major. Quality plaques awarded to all classes. Show schedules available March onwards. Details etc., J. J. Edwards, 'Glanafon,' Mill Park, Llanblethian Cowbridge, South Glamorgan CF7 7BG.

**15th June:** Gosport & District A.S. Annual Open Show. Details from I. Clarke, 37 Rowner Close, Rowner, Gosport. Tel: Fareham 86106.

**15th June:** Taunton & District A.S. Open Show is to be held at the Corfield Hall. It is hoped to make the show schedules available in early April and these together with further details will be available from the Show Secretary S. Pearcy, Hillhead Cottage, Pyrland, Taunton.

**22nd June:** Hinckley and District A.S. 4th Open Show will be held at Westfield Community Centre, Rosemary Way, Hinckley. Schedules from: W. Fielding, 15 Council Road, Hinckley, Leics.

**29th June:** Dunlop Aquarium Keepers Society First Open Show in Works Canteen, Speke, Liverpool, 24. Further details later.

**29th June:** Lincoln & District A.S. Annual Open Show will take place at The Drill Hall, Broadgate, Lincoln. Show secretary, G. S. Hill, c/o 36 Richmond Road, Lincoln LN1 1LQ.

**20th July:** Sandgrounders A.S. Annual Open Show at Meols Cop Secondary Schools, Meols Cop Road, Southport. Show Secretary: G. A. Waterhouse, 23 Moss Lane, Southport, Merseyside PR9 9QR.

**26th July:** Goldfish Society of Great Britain, Conway Hall, Red Lion Square, Holborn, London W.C.1.

**1-2 August:** Hull A.S. (Hull Show "Aquarist Section"), East Park, Holderness Road, Hull.

**3rd August:** Tonbridge & District A.S. Open Show. Show secretary, S. Feast, 19 Eardley Road, Sevenoaks, Kent TN13 1XX. Sevenoaks 54998.

**10th August:** Grimsby and Cleethorpes A.S. Open Show Memorial Hall, Cleethorpes. Schedules from: Show Secretary—T. P. Walker. 51 Cheshire Walk, Grimsby, South Humberside.

**7th September:** Bethnal Green A.S. Open Show to be held at The Bethnal Green Institute, 229 Bethnal Green Road, E.2. Schedules and further details available from the Show Secretary, Sybil Hedges, "Koi Kornor," 150 Ashburton Ave; Seven Kings, Ilford, Essex, IG3 9EL. Tel: 01-590 3239.

**21st September:** Hucknall & Bulwell A.S. Annual Open Show. Details to follow. NE9 6UJ. Phone Low Fell 877156.

**22nd November:** Goldfish Society of Great Britain, Conway Hall, Red Lion Square, Holborn, London W.C.1.

**22nd November:** Fur, Feather & Aquaria Show, King's Hall, 39 Lower Clapton Road, E.5. Schedules and further details from Show Secretary, Sybil Hedges, "Koi Kornor" 150 Ashburton Avenue, Seven Kings, Ilford, Essex, IG3 9EL. Telephone 01-590 3239.