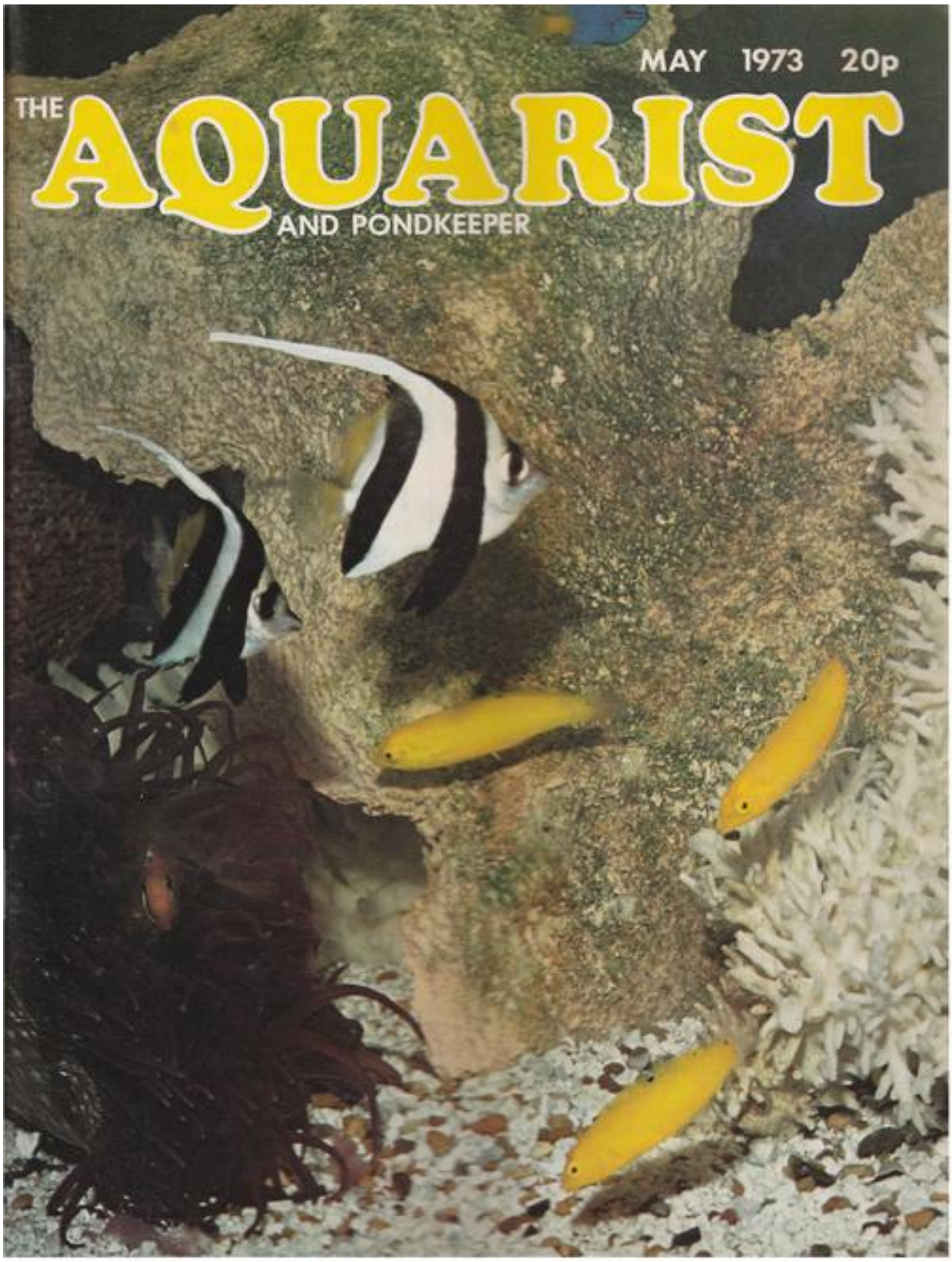
MAY 1973 20p

THE AQUARIST AND PONDKEEPER



THE AQUARIST AND PONDKEEPER

Published Monthly 20p

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WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author

To SET the ball rolling we begin this month's feature with a letter from 13-year-old Paul Maxwell, whose home is at 33a White Rock, Hastings, Sussex. My photograph of a convict cichlid in the March edition motivated Paul to write about his convict. It is kept in a 3ft. tank, together with large mollies, swordtails, black widows and a giant danio—as well as a P. kribensis and a blue acara. These latter fishes are always fighting over their own territorial areas, and regularly display their colours. The convict is fairly peaceful, despite what some books say, and is about 3½in. long. The fish loves Aqua Tabs, and swallows them whole after taking them behind an Amazon sword plant. The mollies also like tablet foods. (I find that both my green and my black mollies are very keen on freeze dried shrimp tablets.) Paul's convict, together with an angelfish, act as the tank's "boss," but they have only once had a serious fight. Master Maxwell's large, green, male sailfin molly has mated with some female black mollies, and these have produced marbled sailfin mollies. Paul's fishes are very tame and readily feed from his hand. He enjoys W.I.Y.O.? very much, and would like to see *The Aquarist* published every fortnight.

Creffield House, South Street, Manningtree, Essex, is the address which heads the letter received from 16-year-old Niall Caven. Three months ago Niall noticed some large convicts crowded in the corner of one of the tanks in his local dealer's shop; he bought a healthy-looking pair for 50p, and placed them in his cichlid tank—which houses various other large cichlids. The convicts settled down well, and within ten days the female had laid a large batch of eggs on one of the rocks. Niall thought that the other fishes would immediately eat the eggs, but the mother gallantly defended them. The parents were zealous guardians, and soon the male had about twenty other fishes—including one 5in. Oscar—at bay in one corner of the tank. The adult and baby convicts were removed to another tank to protect the other fishes. Since then the fishes have bred three times, without any special attention. Niall's only trouble is that he has so many convict fry that he has to feed them to his angels.

Mr. A. W. Paterson writes from 37 Phillips Avenue, Wolverhampton, WV3 7DU, in answer to a recent query about the keeping and care of axolotls. Mr. Paterson has himself been looking for references, and has uncovered the following so far. Unfortunately, none is easy to come by, but can be obtained from the National Lending Library for Science and Technology, often as photocopies. He wonders if they might also be obtained through a public library. 1. Probably the most accessible: "Universities' Federation for Animal Welfare Handbook," which contains an article by Elizabeth Boterenbrood (Mr. Paterson thinks that the article appears in the third edition of the handbook). 2. Article by E. M. Deuchar, in "Penguin New Biology," No. 23, 1957. 3. "Mexican Axolotls, dark and mutant white strains: care of experimental animals," by R. R. Humphrey, 1962: "Bulletin of the Philadelphia Herpetological Society," April-September 1962, pages 21-28 (this is the best concise account of care and breeding which Mr. Paterson knows). 4. V. V. Brunst 1955: "The Axolotl:" (1) As material for scientific research" (includes care and breeding); "(2) Morphology and Pathology" (but not infections); and in "Laboratory Investigation" (this is a journal)—Vol. 4, No. 1, pp. 45-64, and Vol. 4, No. 6, pp. 429-449. Mr. Paterson says that serious students will want to consult the following: "Synopsis of the Hepetofauna of Mexico, Vol. 1: Analysis of the literature on the Mexican Axolotl," by Hobart M. Smith and Rozella B. Smith, 1971, Eric Lundberg, West Virginia (a bibliography of 3,311 titles, with introduction and extensive subject index). Mr. Paterson has not seen this work, but it is mentioned in the British Journal Herptol., December 1972—price not given. (I hope readers who are interested can sort out what I have written above. As I don't know any of the works cited, I've been unable to punctuate them properly; however, there should be enough to be going on with in this list!)

So far I have avoided using the majority of the letters about larger cichlids which I received this month; the length of the letters would appear to match the length of the fishes! I'll begin with one of the longer letters, and it comes from Mr. D. Kershaw, of 16 Sandy Lane, Heatley, Lymm, Cheshire. Mr. Kershaw is a cichlid fanatic, and he has reared convicts and pink convicts from young fry up to breeding size; bred these adults; and reared their fry until large enough to be sold to local dealers. He began by buying five two-month-old convicts for 50p, and kept them in a 3ft. tank with the fry of blue acaras and pink

convicts. The tank contained two undergravel filters and was heavily planted with various aquatic plants. The local water in Lymm is quite hard, and Mr. Kershaw added an outside filter, containing peat, to the tank. The temperature of the water was about 74-76°F. The initial diet of the young convicts was frozen beef heart, finely grated using a Prestige stainless steel grater, white worms, Phillips flakes mixed with Bemax, *Tubifex* and *Daphnia*. As the young convicts grew bigger, coarser food was added to their diet. The males grew more quickly than the females, and after four months the male fish were 3-3½in. long, and the females 2-2½in. By this time, most of the plants had been uprooted, and only floating fern and duckweed thrived.

The convicts, both banded and pink, now began to pair off: two male and three female banded convicts, and three male and two female pink convicts. The pairs began digging in the gravel—right down to the filters—and became aggressive when any other pair strayed into their territory. Mr. Kershaw then picked the best male and female of each colour and placed a divider in the tank. A 3in. clay pot was placed in the banded convicts' half of the tank, and the pink pair were given a conical sea shell. The other convicts were sold as pairs. The tank conditions of the breeding pairs were kept the same as given above, and about two gallons of water were changed per week. The breeders were fed on chopped earthworms and frozen beef heart for about two weeks. The banded convicts laid their eggs in the flower pot during the night or in the early morning; the eggs were light brown in colour, and the female guarded and fanned them; she also picked the eggs up in her mouth, cleaned them, and spat them out again. The eggs hatched in three days and both parents tended the young. The babies were herded by the parents, and were picked up and moved to a hollow in the gravel. The lights were now left on for 24 hours per day, and the adults were only fed on chopped earthworms, all of which they ate. The fry were fed on boiled egg yolk which was mixed and shaken up with cold, boiled water. A few drops were fed to the fry at 7.30 a.m., 9 a.m., 12 noon, 6.30 p.m. and 9 p.m. Mr. Kershaw could see that the fry were eating the egg yolk as their stomachs became yellow. (The yolk mixture was usable for four days, when kept in a fridge; after four days a fresh mixture was made.) After a week the fry were fed on Miracle Fry Treet, and Phillips flakes ground into a fine powder. Although the parents behaved well, Mr. Kershaw decided to remove them. There were now about 40-50 fry, and brine shrimps and sifted *Daphnia* were added to their diet. The egg yolk was no longer used after ten days.

After four weeks the youngsters varied in size from ¼-⅜in.; after 3½ months the fish were 1½-2½in. long and numbered 37 when sold to a local shop, approximately two-thirds reared. The pink convicts laid their eggs in the shell and Mr. Kershaw could not see the number or colour of them. About 200 fry appeared, but their owner points out that the parents were bigger than the banded convict parents. These fry were raised in exactly the same manner as the other fry, but after two months heavy losses occurred due to overcrowding. When the youngsters were 1½-2in. long they were sold. The parents, after a resting and conditioning period of five weeks, bred again; the fry were again reared and sold.

A complete change of subject comes with a letter from Mr. M. Eydmann, of 20 Kildowan Road, Goodmayes, Ilford, Essex, and he recently took up the hobby again after a lapse of ten years. He writes: "May I take this opportunity to say how much I enjoy reading your magazine. I was an avid reader some ten years ago and I have recently regained my interest in the hobby. I was pleased to note that you have maintained the high standards of *The Aquarist*. However, there is one point I should like to mention. Ten years ago I found the section dedicated to the 'News from Aquarists' Societies' intensely boring, and an annoying waste of space in what was otherwise an excellent publication—and I'm afraid I still do. It can appeal only to a minority of your readers. Whilst I would agree that a section devoted to giving details of forthcoming events, changes of secretaries' addresses, invitations to join various societies and the like would be a valuable service, I fail to see the validity in giving over anything between five and seven pages to columns of competition results. How about condensing this section? Even advertisements would be more interesting and would increase your revenue; but, better still, let's have more articles of interest to the majority of your readers. Congratulations on the best magazine available to the British aquarist, despite the histories of the aquarists' societies. Keep up the good work!"

Ken Lee is 17 years old, and writes from 30 Rochester Road, Northwood Hills, Middlesex, on the subject of the plant hornwort. His problem is how to slow down the growth of his hornwort plants. He has always found that it grows well under any conditions. He has grown it in a coldwater tank with no top lighting and no direct sunlight. He finds that it grows exceedingly fast in very soft water, lighted by a 25-watt bulb. Under such conditions, with an undergravel filter in the tank, he has had it grow ½-1in. per day. Ten days ago he planted six "tops" of this plant in clean gravel in a tank containing fresh, fairly soft, tap water; the tank was 15in. deep and was lighted by a Gro-Lux tube. The plants are now 6in. high! Ken continues his letter: "While I am 'backing Britain' all the way, I am afraid that the quality of many foreign foods, tonics, equipment and books well exceeds the British standard, but I am pleased to note that more and more British aquarium goods are appearing on the market. Com-

petition, though, is very strong—especially from Tetra, who provide an excellent service in tonics and foods. I am pleased to note that Phillips are increasing their range of products." Ken continues: "May I make a suggestion to your excellent magazine? How about publishing, at the end of each year, an index to the articles published? I am not, of course, referring to W.I.Y.O.?, but to the many first-rate reports that appear each month. I am sure that your subscribers would be eager to pay 'a few bob' at the end of each year to enable *The Aquarist* to grow into an encyclopaedia of knowledge and experience." (I must say that I too would like to see an appropriate index to back numbers, each time that I search through a dozen or so magazines to find a particular article or piece of information or review. Perhaps our Editor would give this idea serious consideration if other readers would write to me expressing their support. We seem to be very well on the way in that attractive *Aquarist* binders are available at reasonable cost, and the pages of each magazine are numbered to follow on in sequence. Let me have your views, please.)

I'll break off here to include a photograph of one of my well planted and stocked tanks (Photograph I). The air stone was added to the tank especially for the photograph as I required a shot of a tank containing an operating air stone for another purpose. What do you consider to be the advantages of using an air stone in a tank? (I no longer ever use them at all.) Perhaps I might also make a plea here for readers to keep their letters rather shorter than has been the case in many instances this month. I have a massive pile of letters beside me at the moment, and most of them are so long that any one would take up the remainder of the feature. I like to fit in as many different views as possible each month, and I'm afraid that the inclusion of several very long letters means the exclusion of a much larger number of shorter letters. If you could keep your letters down to a maximum of two or three sides of notepaper, it would enable me to fit in more letters without having to edit them down to usable size. It's a minor point, but some of this month's letters ran to *eleven* pages!

Mr. D. Williams lives at 27 Ferguson Avenue, Greasby, Cheshire, and he started keeping fishes about 11 years ago. He maintains that a clean, healthy tank is the first essential in aquarium keeping. To this end he advocates the use of undergravel filters and heavy plantings, and says that too many aquarists fail to realise the value of plants in the tank—their contribution to "a biological balance, combined with undergravel filters." He says that this combination "is the only way we can imitate nature in false surroundings." Mr. Williams points out that plants feed on waste material produced by fishes, and therefore help to prevent the formation of toxic substances. He also notes their ability to take in carbon dioxide and so allow more oxygen to take its place; as well as the aesthetic aspects of the use of plants in aquaria. "What all aquarists should strive for," writes Mr. Williams, "is an underwater world as natural as possible." (I would certainly agree with Mr. Williams's views on plenty of plants in the majority of tanks, but I doubt if one could honestly say that there is anything "natural" about undergravel filters—even though many aquarists find that they do a very good job in keeping

tanks clean.) Mr. Williams continues: "May I recommend the plant collections from Mr. D. Smith of Kidderminster, both for quality and quantity." He goes on to say that he fully agrees with the views expressed by Mr. Foster (December 1972 edition). He would also like to see some articles on plant layouts as he says that books which include such information only do so for smaller tanks at minimum costs. He says that most aquarists would give their back teeth for a set-up such as that shown on pages 30-31 of "The Complete Aquarists' Guide to Freshwater Tropical Fishes," and he says that he would be pleased if a photograph could be taken of the layout shown in the above book, or of a similar layout. (I still have not seen the photograph which has attracted the attention of several readers. Unfortunately, as I have found out, it's very difficult to take photographs of whole aquarium layouts using black and white film, without the use of several expensive lighting units, etc. The above photograph which I took was of one of my larger tanks, lighted by two photo floods. The result, in monochrome, is not very impressive, as one can only see varying black, white and grey tones. The same photograph, taken in colour, is much more impressive because one can then see the different tones of colours of fishes and plants, and the photograph gives a much greater impression of "depth.") Mr. Williams ends this section of his letter by asking: "Where have all our plant experts gone?"

Simon Card is 17 years old, and he lives at 18 Heronswood, Kilwinning, Ayrshire, Scotland, KA13 7DP. Simon begins his letter thus: "First, I must congratulate you on an excellent column in what is almost certainly the best magazine about the hobby. I have been buying *The Aquarist and Pondkeeper*—why do so many people tend to miss out 'the Pondkeeper,' I wonder?—for over a year now. My only suggestion for the magazine would be a pen friends' column where people could write in giving their age and their specific interests in the hobby. I'm sure, in this way, a lot more enthusiasm could be achieved in the hobby." Simon goes on to say that his favourite fish are *Corydoras* species. He has seven at the moment, and one is an albino like the one in my photograph (December 1972 edition). Simon's catfish seems to be losing its "whiskers" gradually, despite the fact that the gravel in his tank is neither rough nor sharp. The other four *Corydoras* in the tank have complete sets of "whiskers." Food, in the form of pellets, is added to the tank at night so that the catfish get plenty to eat. He wonders if readers could give him any appropriate advice on this matter.

Our final letter this month comes from Mr. R. Loten, and his home is at 220 Plumstead Common Road, Plumstead, London, S.E.18. He writes about his opinions on filters. In tanks of over 2ft. in length he uses an Algarde undergravel biological filter; he also finds this filter essential in tanks in which large fishes are kept. Mr. Loten quotes, as an example, his experiences with the keeping of four young Oscars. As the Oscars grew, so did the cloudiness in their tank—caused by bacteria, Mr. Loten says. At the time the tank contained two inside corner filters. The tank was stripped down; but the trouble appeared again; so it was stripped down yet again and an Algarde filter added.

Continued on page 63

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 would appreciate some information on the general behaviour and care of *Hemiodus gracilis*.

First and foremost, keep the aquarium well-covered. *Hemiodus gracilis* is a great jumper. Secondly, make certain it has plenty of swimming space. In the matter of temperature, a range of from 72°F (22°C) to 80°F (27°C) is about right. A varied diet is advised, with such things as *algae*, cooked spinach or other cooked table greens included. Finally, *H. gracilis* is peaceful and gets on well in a community tank provided no boisterous or fin-nipping fishes are present.

I have just purchased a pair of fish called American flag fish. Unfortunately, I have not been able to trace this species in any book. I should like to know something about it.

The American flag fish is mentioned in most of the more comprehensive guides to tropical fishkeeping. Look for it under the scientific name of *Jordanella floridae*. It is, of course, native to Florida. It is an egg-laying cyprinodont that has been known to aquarists for about sixty years. It haunts the lower levels of the water. It flourishes best in a thickly planted tank maintained at a temperature in the middle to upper seventies (°F). *Algae*, or a substitute for *algae*, is necessary in its diet. It is not to be trusted with timid fishes or fishes much smaller than itself. Breeding is quite easy. Eggs are deposited in a shallow depression scooped out in the sand. The female should be separated from the bullying male after spawning is over.

Is it true that varieties of the angel fish (*Pterophyllum scalare*) **are more prone to disease and deformities than the type?**

This does appear to be the case and if an equal number of youngsters of ordinary angel fish and, say, black veiltails are placed in a tank, the aquarist usually ends up with more ordinary angel fish than fancy companions.

I should like some information on a fish I have bought called the ornate bichir.

The ornate bichir is known to science as *Polypterus ornatapinnis*. It is native to the upper and middle Congo and attains a length of about a foot. In its smaller sizes it may be kept with other fishes too large to be swallowed. A temperature in the lower to upper seventies (°F) suits it and food such as bloodworms, meat maggots, guppies, strips of raw red meat or white fish may be given. The fish thrives best in a spacious aquarium.

How can the aquarist tell the difference between male and female orange chromides (*Etroplus maculatus*)?

Age for age, in mature fish, the male is larger than the female and sports brighter colours. The brighter colours are very apparent when the male is in breeding condition.

Have you had any personal experience of growing a plant called the water aspidistra? My plant appears to be making no progress after more than four months in my aquarium.

I bought a plant of water aspidistra (*Anubias lanceolata*) as long ago as 1936. The plant was potted up in a mixture of peat and coarse sand and placed in the shadiest part of a tank kept at a temperature of about 75°F (24°C). It grew so slowly that the original leaves were still on it when Hitler's legions invaded Poland. *A. lanceolata* (and there are other species) likes to be left alone. Given soft water and a diffused light it will produce new leaves slowly but surely.

I topped up my aquarium with water fresh from the kitchen tap and soon afterwards noticed three of my nine golden barbs swimming in a head downwards position. They have made some improvement but are not yet back to a normal horizontal position. Can you offer any explanation for this trouble?

Apparently you did not heat the fresh water to the

same temperature as the aquarium and the barbs, mistakenly believing that something good was about to come their way, swam snapping-mouthed into the sudden rush of cool water. This was sufficient to bring about derangement of the swim bladder. If you keep the affected barbs in very shallow water, just above the tip of the dorsal fin, for a week or two they should make complete recovery. The temperature of the shallow water should be no lower, and certainly not much higher, than that of the aquarium.

Please give me some information about the Siamese shark.

This species, under its formal name of *Pangasius sutchi*, has been mentioned several times in our pages. It is neither a member of the genera *Labeo* nor a species of *Morulius* or Luciosoma, but a catfish of the tribe known to science as the *Schilbeidae*. Nobody seems to know its maximum size, but at seven or eight inches it can, and does, make short work of much smaller fishes. It has a greedy, shark-like look about its mouth and eyes, swims rapidly in all levels of the water and is handsomely garbed in a mixture of horizontal bands of silver, gunmetal blue and olive green to black. A couple will soon outgrow a 2 ft. tank.

Is the umbrella cichlid an easy fish to keep and breed?

The answer to this question is yes, that is if you give *Apistogramma borelli*—to give this species its scientific name—a tank to itself and maintain the temperature at about 75°F (24°C). The water in the tank should be soft and give an acid reaction.

I wish to collect and store rainwater for use in my aquarium. Can you tell me a suitable way to go about it?

Obtain one of the large plastic containers used by home wine makers. Give it a good washing out and then wedge a large plastic funnel in the neck. Layer the bottom of the funnel with some well-washed crocks, and on top of these spread a layer of filter wool to keep out dust and airborne debris such as paper or fallen leaves. Place the container well away from trees, overhanging shrubs and toxic metal spouting.

I introduced two red-tailed sharks (*Labeo bicolor*) **into my 2 ft. community tank and from the start they have taken a great interest in each other. Sometimes they just chase about in and out of the plants, but lately they have been locking jaws and wrestling. Is this behaviour a prelude to spawning?**

It could be taken as a prelude to spawning, but I doubt it. As a rule, two red-tailed sharks will indulge in a major or minor punch-up every time they meet, and in most cases the weaker of the two soon goes into a decline and dies. All in all, it is not advised to keep more than one red-tailed shark in a community tank.

Can I mate a red oscar with a brown oscar and expect fertile eggs?

The red oscar is merely a colour variety of the brown or ordinary oscar, so breeding will follow as a matter of course, that is if the two sexes are ready. But I must say it seems a great pity to breed a red oscar back to the type.

I have a 3 ft. tank illuminated by a 20 watt warm white fluorescent lamp, but I cannot get *Vallisneria* **or** *Cabomba* **to stay grass green and grow. Would the introduction of a chemical fertilizer do the trick?**

What your plants require is not a fertilizer but a brighter light. Add another choke to take another 20 watt lamp or remove the existing 20 watt choke and substitute a 30 watt choke to take a 30 watt warm white or Gro-Lux type lamp. Keep the light switched on for at least ten hours a day. Alternatively, give up the idea of trying to grow light-loving subjects but plant up with species of *Cryptocoryne*, *Vesicularia* or *Microsorium* instead.

I have just obtained a trio of cichlids which my dealer called zilli. Will you please inform me as to the country of origin, general behaviour, full size and feeding habits of this fish?

I hazard the guess that the cichlid you have bought is *Tilapia zilli*, that ranges in the natural state over Jordan, Syria, Israel and thereabouts. It attains a length of about a foot and is too quarrelsome for a community tank. It eats almost anything living (small enough to be swallowed), tender green, or dried. Unlike most other tilapias, it is not a mouthbrooder but deposits its eggs in hollows in the sand or on rocks.

Please could you give me all the information you have on *Hypostomus Plecostomus?*

I do not know where you got this name from as I have never heard of such a fish. There is a *Hypopomus artidi* known as the Mottled Knife fish from Eastern China. There is also a Genus of fish known as *Plecostomus*, comprising several species, such as: *P. commersoni*, *P. punctatus* and *P. rachowi*, which are tropicals from South America.

Nearly all my goldfish in a garden pond have caught a disease which looks like small white ulcers. I caught a fish and found that there was a blackish thread sticking out from the ulcers. What is this and could the trouble have been brought in with water lilies from a local pond?

From your description it appears to me that your fish are attacked by Anchor worms (*Lernaea*). The pests could certainly have been introduced from the local pond, and I am so often warning pondkeepers against this practice. You will have to catch all the fish and examine them carefully. Pick off the pests after you have touched them with neat T.C.P. As these creatures, (actually they are a parasitic copepod) are the females which have a bag of eggs on their rear. Young larvae can hatch from these eggs and reinfect the other

fishes; but if the females are destroyed before the eggs can hatch you have a good chance of clearing the pond of them.

I have found some leeches clinging to one or two of the fishes in my pond lately. The leeches are quite easily picked off and are only about one and a half inches long. The fish do not appear to be damaged badly. What is the best way of ridding the pond of the leeches?

There are several species of leeches and yours may be one of the smaller types. The type on your fish could be *Piscicola geometra*. These are about an inch long, but as they can extend or withdraw to a fair margin it is difficult to give an exact measurement when taken from a fish. Apart from picking them off there are a couple of ways you can try. Place some flat stones or pieces of slate on the bottom of the pond near the sides where you can reach them. Each morning examine the undersides and you may find the leeches clinging there. You can also make a trap, as I have recommended for newts, with a preserving jar and a funnel held in the top with the screw cap. Place a piece of meat in and lower each night. Keep attached to the side with plastic string and examine each morning.

There is a lot of black at the bottom of my plants in tank. What is this?

The black mulm is caused by the decaying of uneaten food. Change some of the water and stop feeding with dried food for at least three weeks and the black will probably clear as the growing plants use it up.

COLDWATER QUERIES

by Arthur Boarder

I am breeding show standard Red-cap organdas and Briston shubunkins. I have sent for the standards booklet from the Goldfish Society and find that only five points are given for colour, which is silver. Also there is no pointing for red on shubunkins. Is it worth carrying on? I have been keeping fishes for 25 years and am now very confused by the standards quoted.

Please carry on breeding the type of fish as you are doing. A Red-cap oranda should have a white (silver) body with a red head or it is not a Red-cap. As for the red on your shubunkins, the better the red the more points your fish should gain at a show. What you and I call red on a fish is called orange by the Society. It may not be that the Society is colour blind but they are steeped in the old traditions and ideas of one of the men who was mainly the founder of the Society. He it was who dreamed up all those weird names such as: Twintail; Monolyptic (single-tail), Bramble-head, Globe-eye, nacreous and matt. Also the "Four basic varieties". He also stated that all the ignorant mutts like us were wrong to call the *red* on goldfish that colour as it was *orange*. As all he said was swallowed hook, line and sinker, as if his words had dropped from above, you can see where the colour change originated.

Now I have orange and red fantail goldfish in my pond for anyone to see. The red are a good red, but I know that there are shades of red as there are of orange. The reason why I have the two colours is easy to explain. When the young ones are up to a few months old they are bronze. As they change colour they turn a pale gold. This then develops into a pale orange, deepening to a deep orange after a while. Then after a spell in the garden pond they turn red, and gradually this red deepens as the fish ages. None of my fish would be likely to turn red inside two years in the pond.

I cannot understand why the Bristol Aquarist Society appear to have had nothing to say about the pointing for the shubunkin as when the Federation produced their standards in 1947, that Society insisted that their points were to be used with no alterations whatever, and the Federation agreed.

I will be moving into a house shortly which has a large pond (18 ft. × 48 ft.) in the grounds. It is well planted but there are no fish. It slopes from six inches at one end to six feet at the other. I would like to keep some Koi and would like to know how many fish it would comfortably hold? Also the address of the Koi Society?

The pond is a fine size for Koi and would hold about twenty good sized fish. However, I am rather concerned by the fact that there are no fishes in it at present. There may be a reason for this, and before laying out cash on a number of good Koi, I recommend that you try out one or two other fishes first. A couple of fair sized golden orfe would be good for experimenting with. They would only live in water which is in good condition and as they are mainly surface feeders and swimmers, they would be seen more easily than some other types. If the water is in a healthy state and there are no predators in it, you should be able to breed with the Koi quite easily. The address you require is enclosed.

Could I connect a filter to my waterfall as the water is green and would the charcoal affect the fish?

It is quite possible to run a filter in connection with a waterfall. If there is a pool included in the fall this could contain small charcoal and sharp sand. It may not clear the pond of green but it would remove much

debris if cleaned now and then. The charcoal would not harm the fish.

I have caught a small Flounder and some crabs and put them in a tank with some sand on the bottom. They are feeding on worms and meat. If I put another Flounder will they breed and can I breed the crabs?

I do not think that you have any chance of breeding with Flounders. These are sea fish and breed only in salt water. They will often swim into brackish waters and sometimes swim well up some of the Welsh rivers, where the water may be quite fresh. They appear to swim there for food but have to return to the sea to spawn. Crabs would also be very unlikely to breed when given your conditions.

Three goldfish have died in my pond recently. Why is this please?

Without more informationas to the conditions in your pond it is quite impossible for me to say with any degree of certainty from what trouble your fish died. There is one thing on which you can be sure; goldfish do not just die without reason. If you find one dead which shows no signs of damage or disease and which had not been acting strangely before, then it is almost certain that the condition of the water is at fault. When the water is foul it is not always that all the fish die, but often the larger ones will be the first to be in trouble. Many people never think of cleaning out their pond in early winter and then if there is a lot of decaying matter on the bottom, the water is sure to become polluted. One sure sign of foul water is when bubbles are seen on the surface in the early mornings or the fish mouth at the surface. If the water has a slightly unpleasant smell or looks at all murky, clean the pond out and refill with fresh water.

I sometimes lose a fish in my pond but cannot see anything wrong with it. The water looks clear and I have a fountain working most of the time. Why should a fish die?

I have known of fish dying in ponds where there is a fountain working, when one would expect that the water would remain well oxygenated and pure. However I have discovered that a certain part of the fountain has been made of copper or brass, and it is this poison which has killed the fish. Any pond water contaminated with copper or brass would be most probably quite clear as no *algae* or infusoria would live in it. Examine your underwater parts of the pump and if metal, change to plastic if possible.

We have recently made a plastic pool 8 ft. × 4 ft. × 2 ft. Please advise on fish and plants for such a pool?

You can use one water lily of the small growing type. For oxygenating plants choose from: *Ceratophyllum demersum*, *Egeria densa*, *Lagarosiphon major* and *Elodea canadensis*. Any two of them will be sufficient as they are likely to grow quite quickly once they become established. All are good but the last named can get out of hand if not controlled. As your pond does not get a lot of sunlight the first named, which also goes under the name of Hornwort is a very good plant which can thrive in a deep pond or one in the shade. As for your fears of the pond freezing over in the winter, this could certainly happen in your district and a 100-watt heater could be inserted in severe weather. It need not be left on except when it is freezing and then perhaps only at nights. This would keep open a small hole, which would be sufficient. Never hit the ice to break it but if it does get thick, then place a water-can of boiling water on it and a hole will soon form.

As for stocking with fish, do not try to have too many, four goldfish and the same of shubunkins would be safe, but see that they are not more than about three inches long overall.

I have an outdoor pond, approx. 16 ft. × 8 ft., and the other day I noticed two golden orfe floating on their sides at the surface. I took them out and put them in fresh water and they are still alive but appear rather weak. What was the reason?

I have, so often, written about this happening to orfe in a garden pond. The reason is without doubt that the water lacks oxygen. This may only be a temporary condition. When I kept a few orfe with my fantails, many years ago, I found most of them floating on their sides at the top one morning early. It had been one of those close, thundery nights, when one felt hardly able to get any air. I had come home from work at six a.m. and found the fish looking quite dead. I immediately played the hose on the pond and within minutes all the fish except two were swimming around as if nothing had happened. The others were tried under the tap and given slight gill massage but they did not recover. I realised that my pond was not large enough to house orfe of over a foot long and so I parted with them and have not kept any since. The fantails in the pond showed no signs of distress whatever and I have never had the same kind of bother with them at all. It may not be that your pond water was polluted but the conditions of the air and perhaps that you had rather a lot of plants in the pond could have brought on the dangerous condition.

I have been trying to keep a number of fancy goldfish for two years without success. They lie about on the bottom of the tank or are very sluggish. The water temperature is 65° F by day, dropping to about 45° F at night. The water comes from copper pipes but they are 40 years old and should be safe. What is the trouble?

I think that the main reason for your trouble is that the type of fancy goldfish you are keeping have been bred under tropical conditions. When the water drops to a low temperature at nights the fish get a chill and

this can upset their swim bladder considerably. You could find out at what temperature the fish you buy have been kept and also perhaps bred. If you keep to this you should be all right. The copper pipes may be all right by now but I have heard of so many instances where they have been dangerous to fishes that I always am inclined to suspect them. If I was forced to use such pipes I would make sure that some of the water which has been lying in the pipes was flushed away before I took any for the tank. You state that you use the same water for your pond and this appears all right. The pond may contain different chemicals and minerals which could tend to neutralise the copper.

Is there anything I can put in my pond to stop the fish from getting attacked by fungus?

The best way to keep your fish from being attacked by fungus disease is to make sure that the pond water keeps in good condition. If this is so then the fish will remain healthy. When they are, a good coating of mucus covers their bodies. This is a complete protection against fungus and it is only when a fish is in bad condition and the mucus covering becomes deranged that the spores of fungus can take a hold. The way to prevent the fish from being attacked is to make sure that the water is in a pure condition by not giving more dried food than can be eaten up within a few minutes and by removing all dead water lily leaves as soon as they start to fade.

I have a tank, 36 in. by 16 in. by 12 in., and wish to keep coldwater fishes. Could you please tell me which kinds to keep and how many

Your tank will hold safely 24 inches of body length of fish. I suggest that as you are a beginner you stick to types of goldfish. Good ones for your purpose are: Common goldfish; shubunkins; fantails; lionheads and moors. Do not exceed the number of fish for your tank and do not over-feed.

I have recently noticed my fantail and ordinary goldfish dashing about and knocking themselves against various objects in the tank. Their actions suggest that they have flukes. How can I kill them?

If you are sure that the fish are being attacked by flukes you can try an immersion in a solution of a half teaspoon of T.C.P. to a gallon of water. Do not leave the fish in the solution for more than a few minutes and keep a watch on them so that if they turn over, remove them to fresh water immediately. I only had this trouble with my fish once, many years ago. I used a solution of Dettol and water at about the strength I have stated, and cured the fish of their pests completely and have never been troubled with them again. I put my infestation down to feeding with *Daphnia* from a wild pond and have never used any *Daphnia* since.

I have a pond with goldfish and have had several die which have small holes in their bodies, These are about ¼ in. across. Can you explain this please?

It may be that there are some pests in the pond which have damaged the fish. It is difficult to say which ones are responsible as there are several types which could do so. Fish lice (*Argulus*), could be the culprits, but they usually only make a small hole, but this could increase in size with disease. Any leeches in the pond could also be the cause. A leech will usually attach itself to a fish and when it has sucked its fill it will drop from the fish, leaving a small wound. Other pests include the larvae of the large dragon fly and that of the great water diving beetle. Birds could damage a fish but the peck is usually on the back. You must examine the damaged fish carefully with a magnifying glass to see if you can find any pests and search the pond at night with a strong torch. It is surprising how easy it is to see certain creatures in the pond at night time by this means.

BOOK REVIEW

Tropical Aquaria. *Horniman Museum. Published by the Inner London Education Authority, The County Hall, London, S.E.*1, *price* 15*p*.

In the past eighteen months there has been a considerable increase in the number of publications devoted to tropical freshwater fish in the home. Unfortunately, not all the titles that appear on the bookstands are in the top class. Indeed, quite a number of them are marred by dubious statements, inaccuracies and a superfluity of misspellings. Needless to say, blemishes of this kind do the hobby a great disservice.

Tropical Aquaria by Mr. G. E. Williams, Deputy Curator of the famous Horniman Museum and Library in south-east London, is very different. It says much of the writing skill of the author that he has been able to pack so much authoritative knowledge and practical experience into a mere 48 pages of well-printed text.

Mr. Williams deals briefly but lucidly with the selection of the tank, its heating, lighting, setting up and general care. There are sections on diseases (the most common), fishes (some of the best), plants and, for the serious aquarist who needs the encouragement and know-how to venture further along the paths of discovery, a lot of valuable information on circulating systems. Line drawings illustrate the text. There is a useful bibliography and list of aquarium periodicals that may be consulted in the Museum's Reference Library.

Tropical Aquaria was originally intended to assist visitors to the Museum but this second and revised edition can be recommended to a wider readership without reserve.

Jack Hems.

Pimelodella pictus

by Jack Hems

THE CATFISH described in recent authoritative books under the formal name of *Pimelodella pictus* is one of the most fascinating members of the family *Pimelodidae*. The *Pimelodidae* is one of the largest catfish families native to Central and South America and is represented to aquarists by about a score of species.

The most characteristic features are the very long barbels on the upper lip, a smooth skin, that is a skin devoid of horny plates or scales, and a small- to medium -sized anal fin. The dorsal fin is anterior to the ventrals. The adipose fin is very variable: in some species very long; in others quite short. In most species, the body is long and slim, tapering from the dorsal region forwards to a gently sloping head and snout and backwards to a narrow caudal peduncle.

But back again to *Pimelodella pictus*. First and foremost, this species from Colombia is stunningly marked with an eye-catching pattern of black splashes and bars on a pigeon-grey to satiny white ground. Secondly, it differs from the general run of pimelodids in that it spends a lot of its time in the middle levels of the water. Thirdly, unlike the pimelodids that we have come to know really well as, for example, *Pimelodella gracilis* and *Pimelodus clarias*, it is neither annoyingly scary nor exasperatingly elusive, but every so often approaches close to the front glass, when the delicate pink of its white-lipped mouth and the smooth white barbels may be momentarily observed.

The long maxillary (upper lip) barbels are normally held at right angles to the body, but when the fish is moving through an avenue of plants or making one of its forward rushes to mouth and frighten away intruders into its immediate area of activity (or non-activity), they are folded back to the side. The much shorter mandibular barbels project downwards.

The deeply forked caudal fin and tall dorsal fin bear irregular black bars. The anal and ventral fins are grey with wide pinkish white margins. A black blotch adorns the upper part of the grey adipose fin. The strong pectoral fins are sickle-shaped and anteriorly bordered with white. Sharp spines are present in the pectoral and dorsal fins, and when purchasing this fish it is of the greatest importance to see that it is placed in at least three carrying bags, one inside the other, otherwise there is the very real danger of the fish pricking the plastic and letting the water out. It is to be noted, too, that the fish has the ability to emit a clearly audible buzzing noise. This can be heard in or out of the water. It could be likened to the noises made by a bee or bluebottle fly stuck fast in a spider's web.

P. pictus is quarrelsome among its own kind, and several specimens kept together in a small tank almost always show nibbled barbels and tattered fins. Yet a single specimen placed in a community tank stocked with inoffensive fishes (not too diminutive, of course), will do no harm. It will flourish well on a mixed diet of live, flesh and good quality dried foods and attains a length of four inches or thereabouts in half as many years.

Unfortunately this handsome catfish, popularly called the spotted pimelodella, is not often on the market, but when it is it is worth a journey of several miles to obtain a lively specimen.

I know nothing of its breeding habits, and can trace no record of its having bred in captivity. Its external sex distinctions, if any, are not known. To Dr. Herbert Axelrod must be given the credit of making *P. pictus* known to tropical aquarists. For it was during an expedition to eastern Colombia, in the first half of the 1960s, that Dr. Axelrod, accompanied by Mr. William Riese and Captain Emilio Saiz, collected a goodly number of this species and sent them (or carried them) back to the United States.

The fish was first marketed under the erroneous scientific name of "Pimelodella angelicus" but this was later corrected to *P. pictus* (Mueller and Troschel) by Dr. Leonard P. Schultz, of the National Museum, Washington, D.C.

The spotted pimelodella appears to be an easy and lasting species to keep in any properly cared for tropical aquarium maintained at a temperature of about 70°F (21°C) to 80°F (26°C). But then I suppose it is true to say that all the pimelodids have this quality of adaptability.

PLANNING AN ORNAMENTAL POND

by Laurence E. Perkins

Now is the time to make constructive plans for alterations and additions to the garden and among these may be included an ornamental pond. Whether it is likely to be a large affair for the fostering of a shoal of Koi, or a modest little lily pool to form an attractive centre-piece to a lawn, its as well to give the project some careful thought and to make a few drawings and calculations before commencing the soil-shifting.

A pond is not the sort of garden feature that can be used to fill in an odd corner for which no other ideas have come to mind. It should not be sited under overhanging trees where seasonal leaf-fall will congest and pollute the water and where excessive shade will prevent water lilies from giving of their best. For this latter reason situations near tall fences or hedges should also be avoided. If there is a choice of levels, the highest rather than the lowest should be chosen. This precludes the possibility of unwanted additives being washed into the pond by surface water during heavy rain while the advantage of a raised position may be an asset when the pond needs draining for a thorough clean.

Most moderately sized ponds today depend upon a

Blossom of Water Hawthorn (*Aponogeton distachyus*)

plastic or fibreglass liner rather than the orthodox shell of concrete and the use of these modern aids removes a good deal of work and quite a number of heartaches for those not well versed in the art of concreting. The simplest and quickest method of obtaining an instant pool is to use a fibreglass liner. These are available in a range of sizes and merely require the digging of a hole into which they can be fitted. Varying depths and convenient ledges for the placing of planting-pots are included in the contours of the liner.

Plastic and butyl rubber sheeting is sold for pond-lining and is of especial value to the man who wants to follow his own design or who wants a really large pond because most of these materials can be supplied in very large sheets of almost any area although they are measured only in squares and rectangles. One of the main advantages of using a plastic liner is the freedom of choice so far as depth is concerned. Of recent years we have not experienced severe winter conditions but long periods of very cold weather *do* occur in Britain and during such conditions fish in ponds having deep areas of two feet or more will have a better chance of survival than those in more shallow ponds. The pond area at this depth need not be more than a couple of square feet in the case of the average garden pond so that some swimming area remains if there is a build up of ice thickness which, in a shallow pond, would mean the freezing of all the water.

Whether the design of the pond is to be formal or informal, varying depths can be achieved by arranging for a shelf to run along the sides of the pond at a depth of say, nine inches. Then, at one end there can be a lower shelf nine inches below the first and of a greater area and leaving a small area at the opposite

The Fringed Water-Lily

Water-Lilies require sunny situations

end which can be dug to create a depth of two feet. The shallow shelf will be useful for accommodating planting baskets containing marginal plants and the deeper shelf for water-lily baskets.

Once the excavation is complete and has been shaped and made ready to receive the liner, it should be measured and the liner ordered. Square and rectangular pond shapes will obviously result in minimum wastage but all but wildly informal designs are often worth the wastage which does arise.

The fitting of the liner is a simple matter of laying it across the excavation, weighting it all round with bricks or stone slabs and letting the hose run into it. As the weight of the water stretches the liner it will take up the shape of the pond's contours and when filled it is merely a matter of trimming off the excess sheeting with scissors to leave about nine inches all around which can be covered most easily by laying paving slabs or crazy-paving on it.

As most pond-liners are non-toxic, fish and plants can be introduced together and immediately the pond is filled although it is preferable to first instal the plants and to allow a couple of weeks to elapse before introducing the fish so that the water will have weathered a little and the plants have had a chance to settle in.

Plants. Plants for the pond and water-garden are usually considered under three headings and described as submerged oxygenators, floating aquatics and marginal aquatics. The first of these provide a certain amount of foodstuff for the fish, ideal spawning medium, cover for young fish and, most important, they aerate the water by dispensing oxygen. Popular

Pickerel Weed in a large pond

and efficient oxygenators include Hornwort (*Ceratophyllum demersum*), *Egeria densa*, *Lagarosiphon muscoides* (also known as *Elodea crispa*), and Water Milfoil, (*Myriophyllum*). Most of these can be readily obtained from aquatic nurseries and while some of them do not have rooting systems, they should all be bunched and weighted with lead strips for convenient siting.

Among the floating plants is a very wide range of water lilies suited to a variety of conditions. Coming in white and shades of yellow, pink and red, there are water lilies for the miniature pool and those with huge leaves and blooms which flourish only in very large pools or lakes. Water lilies are sold as suitable for a particular depth of water and guidance should be sought in this connection from the stockist. When planting, the crowns can be placed in prepared pots, plastic baskets or sacking bags but the planting basket is designed for the purpose and is ideal. It is more important when planting to get the right consistency of soil than it is to give priority to richness of the mixture for the plant will obtain its nutrition from the waste products which will accrue naturally. A good heavy loam or clay is preferable and light soil should be avoided at all costs as it will sift through the planting basket and leave the lily either stranded and stunted or anchored to the bottom of the pond by its escaping roots.

Many other floating aquatics have attractive characteristics so long as they are kept under control but the tendency is for most people to start off with too much in an endeavour to make the pool appear less bare and new-looking. The duckweeds, for example, look most pleasing in the form of a small green patch but they soon get out of hand and either smother the whole of the pond surface or become scattered to give a most untidy finish to the pond. Frogbit, (*Hydrocharis morsus ranae*), in small quantities looks like a very small water lily but when it prospers it produces a host of 'winter-buds' at the end of the season and these drop to the pond bottom from whence they rise in the following spring, each to produce a flourishing plant which also multiplies by throwing out runners. *Azolla carolliniana* or Fairy Moss has the same habits as the duckweeds, each little "leaf" being a separate plant. When once established it has the same spreading propensities as the duckweeds but is more easily controlled because of its larger and more robust "leaves." The Fringed Water Lily, (*Nymphoides peltatum*), is not a water lily but has that

Great Reed Mace, a tall marginal for the large pond

appearance with its small pads and tiny yellow blooms. Again, this is a plant whose attractiveness declines if it is allowed to spread too widely.

One of the best floating plants other than the lilies is the Water Hawthorn, (*Aponogeton distachyus*), which has the tidy habit of retaining its oblong leaves within a symmetrical patch. Its white flowers with black anthers are carried just above the water surface and are reputed to emit a hawthorn-like scent.

Marginal plants are those which like their feet in water and include a very wide variety of species many of which belong only by the lakeside. Some of them like the irises, rushes and grasses, display tall-growing foliage and blooms and contribute greatly not only in appearance but also audibly by rustling and whispering in even the slightest breeze. Other marginals form clumps at the water edge like the Marsh Marigold or creep over into the water like Creeping Jenny (*Lysimachia nummularia*). Many of these share a proclivity to spread by producing runners and it is as well to limit their rooting excursions from the outset by planting them in pots or plastic seed-trays. Roots will still creep over the edges of their containers but these can be removed with a sharp knife.

Fish. The prime function of fish in an ornamental pool is to provide colour and movement and the best

Flowers of Bog-Bean (*Menyanthes trifoliata*) a good marginal

Primula florindae, a tall growing primula, like a giant cowslip, which likes the waterside

all-rounder for this purpose is the goldfish. Having rich coloration and a hardy physique, the goldfish is easy to obtain, is cheaper than any other fancy pond fish and will obligingly multiply under normal healthy pond conditions. When buying the initial stock for a new pond the first essential is to avoid getting too many or specimens which are too large. Fish of a length around two to three inches can be relied upon to settle down and to rapidly grow to a moderate size providing that they are not overcrowded. While it is reckoned that twenty-four square inches of surface area will support one inch of fish it is wiser to work on the basis of ninety-six square inches to an inch of fish so that a pond measuring six feet by four feet could be stocked with a dozen three inch fish.

When buying the fish there are elementary pointers which indicate their state of health. It should go without saying that specimens with torn fins or sore places should be avoided but so also should those which appear sluggish, wobbly in their manner of swimming or those which do not hold their fins erect and display an alertness.

There is an increasing demand for ponds on a larger scale than those already mentioned—ponds which would afford scope for a wider variety of fishes. While the daunting prospect of excessive concreting

Marsh Marigolds or King Cups *(Caltha palustris)*

prevented many enthusiasts from fulfilling their dreams in bygone years, the pond liner makes a big pond a real possibility for those with the space to accommodate it. Submersible electric pumps make the inclution of waterfalls and fountains a simple and relatively inexpensive proposition and with this ability to "turn over" the water, conditions are improved so that lively fish such as Golden Orfe and Golden Rudd can be included.

It is often a good idea to enlarge upon the pond feature in a garden by involving a rockery and, perhaps, a bog garden as well. This is especially worthwhile where a very small pond is concerned. A rockery is often included with the construction of the pond merely because it is the simplest way of disposing of the soil, but a better result will be achieved if such an additional feature is planned. For example, a waterfall can be incorporated in the building of the rockery and the delivery pipe concealed under the stonework.

A bog garden can be sited so that it receives the overflow from the pond during heavy rain or when the pond is topped-up. With the combination of these three situations a very wide variety of colourful plants can be exploited so that there will be colour above, in and around the pond for many months of the year.

CONTROL OF Algae IN THE GARDEN POND

by Philip Swindells

ONE OF the most important problems a pool owner has to contend with is undesirable *algae* growth. Aquatic *algae* occur in various forms, but notably free-floating and filamentous. The free-floating or yellow-green *algae* consist of some four hundred different species which live mainly in freshwater or occasionally on mud. They are generally about the size of a pin-head and occur in their millions to create a green "bloom" or pea-soup effect. The filamentous algaes, on the other hand, appear as free-floating silkweed or spirogyra which can be dragged from the pond by the handful, or else in thick mats known as blanket or flannel weed. Other kinds like the so-called mermaid's hair cling to plants and baskets, and often coat the walls of the pool.

Control of the free-floating kinds is relatively easy with an algaecide based on potassium permanganate, but it must be treated on a cloudy day when the water is not too warm, or else the pool will turn a thick cloudy yellow and have to be emptied. Filamentous algaes can be controlled with proprietary algaecides based on copper salts, but after treatment all dead *algae* must be removed to prevent deoxygenation of the water. Those with a scientific turn of mind, however, can control *algae* much cheaper and equally successfully with straight chemicals. Indeed, in large areas of water this is often the only economical way of doing so.

Copper sulphate is undoubtedly the best, for in small regular doses it can be safely used when fish are present. Where fish are not present it can be used at a greater strength, being harmless to all the higher plants while controlling the *algae* quickly and effectively. It might also be mentioned that under these conditions the stronger copper sulphate application is usually sufficient to control aquatic pests like caddis-fly and will curtail waterlily root rot and fungal leaf spots.

For successful *algae* control where fish are present a concentration of 0·33 ppm. introduced on alternate days over the period of a fortnight usually clears all algal growths. Treated in this manner the water seldom suffers oxygen depletion and the fish are not subjected to asphyxiation by the copper sulphate combining with their body mucus as is often the case with higher concentrations.

In very hard water this dosage may need to be slightly increased as copper sulphate unites with the carbonate of the calcium carbonate to form an insoluble precipitate of copper carbonate. It is essential therefore to test the pH of the water. The water temperature at the time of application should also be ascertained as this may have an effect upon the reaction, for it is likely that the unstable calcium bicarbonate normally found in tap water would leave a higher concentration of calcium carbonate in warmer weather, thereby reducing the effect of the copper sulphate. However, if there are no fish in the pond a dosage of 2 ppm. will kill all the *algae* at one go.

Another algaecide which can be successfully used is sodium arsenite, but great care must be exercised in its use as it is not only toxic to higher forms of plant life but humans as well. Although undesirable in the eyes of many people owing to its very nature, when used at concentrations of between 1·7 ppm. for suspended *algae* and 4·00 for blanket weed and lower submerged plants, it does have the advantage of being harmless to fish.

Finally, one other chemical which should perhaps receive a mention here is formalin, but a great deal more needs to be known about its effect on various plants before its use can be given an unqualified recommendation. A solution of 1 part to 4,000 destroys free-floating *algae* and is definitely beneficial to cyprinid fish, but it induces several cultivars of *Nymphaea* into rapid growth with leaf stalks becoming extended by two or three feet, and in the case of the deep water aquatic, *Nymphoides peltatum*, destroys it completely.

No form of *algae* control is permanent, but the most stable is embraced by the theory of natural balance, in which the correct ratio of plants to livestock and area of water is introduced. Most of the controls based on chemicals are useful in preventing *algae* growing in a new pool but for one that is entering its second or subsequent years their use only effects a temporary cure.

MARINE QUERIES

by Graham F. Cox

After reading several books on coral fishes I have been led to believe that anemones are deadly to all fishes except Clownfish (*Amphiprion* genus). However, on visiting my local shops I was puzzled to see such fish as a Regal Tang, Butterflyfish and Triggers kept in sea aquaria with a variety of dangerous looking anemones. Are the books wrong or are my local shops mis-informed. Also, could you tell me how many *percula* Clownfish I could house with an anemone in a 50-gallon tank?

Your local shopkeepers are not wrong and neither were the books which you read incorrect. On the coral reef, the anemone survives by locating itself in such a position that currents are likely to carry juvenile (and therefore inexperienced) fishes and old or sick (and therefore weak) fishes into the lethal embrace of its waving tentacles. Each tentacle is armed with thousands of stinging cells called *NEMATOCYSTS* which fire poison darts as soon as they are triggered off by contact. The poison in the hollow "darts" soon anaesthetises the entrapped prey and its struggle subsides. Now the slow process of passing the immobile fish from tentacle to tentacle begins until eventually it is forced into the open mouth at the centre of the oral disc. Once inside the hollow body of the anemone and into the cavity (coelom) digestive juices (enzymes) are released which slowly dissolve and break-down the tissues of the victim's body into simpler more digestable substances. Any part of the victim which the anemone's enzymes are unable to break down and absorb is slowly wrapped up in a mucous coating and released as slimy ball—usually during the night. This mucous-wrapped ball of indigestable material floats on the surface of the seawater and is easily removed with a fish net.

Thus it will be seen that the anemone is indeed a predatory invertebrate animal and although largely *sessile* in habit, (i.e. it waits for it's prey to come to it rather than hunting like, say, the Octopus), any fish in the vicinity of an anemone is constantly at risk and must be continually on the alert.

The fact that non-Amphiprion genus fishes (i.e. fishes other than Clownfish) can survive in a sea aquarium with anemones present is a tribute to the watchfulness of the fishes, not the idleness of the anemone.

Fishes in the *Amphiprion* genus, plus *Premnas biaculeatus* (the Maroon Clownfish) and some Damselfishes, seem to have a protective mechanism of some sort which does not produce the stinging response from the nematocysts when these fishes make contact with the tentacles. Either that, or they are immune to the nematocyst's venom (recent work has, however, shown this to be an unlikely hypothesis). At one time it was believed that the peculiar body undulations with which the immune fishes swim may serve as an inhibiting "signal" to the anemone not to release the nematocysts. Many aquarists, however, have reported the occasional use of a protective anemone by fishes of the genus *Dascyllus* (i.e., Domino Damsel, Humbug Damsel and others). However, since these fishes do not have the pronounced "waggle" swimming action of most of the clownfish this theory may need revision also.

In any event, whatever the protective mechanism involved, this fish-invertebrate association is a wonderful example of *SYMBIOSIS*—that is an association between dissimilar organisms to their mutual advantage. In this symbiotic union, the clownfish is protected from the attack of large aggressors by fleeing into the deadly tentacles of the anemone, and the anemone receives tit-bits of food from the meals of the clownfish.

Fishes other than clownfish can certainly survive in an aquarium with anemones, provided that they are healthy and strong. Having begun life on a coral reef all these creatures know how dangerous anemones are and keep well out of their way.

When you set up a mixed community of coral fishes and invertebrates in this way, however, please let me advise you to float your new fishes for *one to two hours* with part water changes ar regular intervals, before releasing them. This ensures the fish is fully sensible of the latent dangers in the aquarium and is able to look after itself when eventually released. A method of ensuring a new entrant's survival in a marine community which I use a great deal is to release the newcomer into a plastic sandwich box, drilled full of holes and with the lid held in place by elastic bands. After acclimatising the fish to my aquarium water for an hour or so in the plastic shipping bag, I pour the fish into the sandwich box, replace the lid, and submerge the box slowly onto the filter gravel base. The fish then remains in the box for one to seven days until I am satisfied that it is fully aware of its surroundings and can defend itself against both the established fishes and invertebrates.

Incidentally, you will find a vitamin supplement of great assistance in the successful maintenance of both sea aquarium fishes and invertebrates. Anemones,

and other coelenterates, such as living corals, benefit enormously from its regular use. The way I use it is to dissolve all the crystals in a half pint of tap water and add one desert-spoonful of the resulting solution to each twenty gallons of water every third day. I always try to do this about half an hour before feeding my fishes and invertebrates, and the improvement in appetite alone due to the vitamin B_{12} (cyanocobalamin) content has to be seen to be delieved.

With regard to the stocking of your 50 gallon aquarium, provided that your tank has completely matured bacteriologically and is showing no nitrite reading *using a reliable kit* (a lot of cheaper kits show no reading whatsoever below 5-10 ppm.) then you *could* stock your aquarium at the rate of 1in. of fish to 2 gallons of water, i.e. your tank will hold 25in. of fish —say 16 Common Clowns at 1½in. total length (*PLEASE NOTE*:—owing to the relatively low oxygen requirement and excretory output of most invertebrates, these animals may be ignored for stocking calculation purposes).

As has already been stated, you should feed your anemones (four at least for this many Clowns) once every third day, preferably some 30 minutes or so after vitamin treatment of the aquarium water. In addition, your tank should contain plenty of calcareous rock work (Devon Black, Limestone, Westmorland Stone, etc.) and corals to minimise the inevitable bickering you will experience with a community of clowns of this size. Both *Stoicactis* and *Discosoma* species of anemones are used by Common Clowns, but a preference is often shown for the latter type. *Cerianthus* (Mud Anemone or Fireworks Anemone) should be avoided in all except purely invertebrate aquarium. This family of anemones is equipped with such potently lethal nematocysts that not even Clown fishes can survive its embrace.

One final point of interest whilst discussing anemones and Clownfishes is that whilst diving around Corregidor and Batan (of Japanese v. Americans fame) recently, I saw Philippino common clowns living only in association with *Stoicactis* anemones. Yet in the home aquarium they nearly always shun the company of a *Stoicactis* sps. anemone if offered a *Discosoma* sps. as an alternative. I suppose this should warn all marine aquarists of the dangers of experimental "home" observation if not accompanied by field-work also.

PRODUCT REVIEW

Petcraft Aquarium Control Unit, price £7·10, marketed by Thomas's Limited, Shelf, Halifax, Yorkshire.

Most of us have seen, at some time, an attractively furnished aquarium which has been spoiled by a jumble of wires leading to heaters, thermostats, pump and lights—and possibly a jumble of air tubing. The new Petcraft Aquarium Control Unit should be the solution to such problems. It consists of a well-designed, aesthetically pleasing little unit with a press moulded fibreglass case of approximately 6 in. × 4 in. × 4in. On the front of the unit are three labelled switches—for lights, pump, and heater. There are two small, red, neon lights, one showing that the mains are functioning, the other, labelled "Thermo," showing when power is being supplied to the heater or heater/thermostat. There are also two machined brass air controls on the front. On the rear of the unit are two brass air inlets and two outlets, each labelled. Under a plate at the rear is a block of eight wire terminals; these are labelled in pairs—for heater, thermostat, pump and lights. The unit has four rubber feet to enable one to place it in a position convenient to the aquarium with which it will be used. It is fitted with about 6 ft. of three-core cable. The unit is covered by a twelve months' guarantee, with free replacement if necessary. The outfit comes complete with clear instructions for use, and two large, clear circuit diagrams are supplied, one showing how the unit may be used with a separate heater and thermostat, the other how it may be used with a combined heater/thermostat. One or two air pumps may be used with this unit.

In use, I found that the unit was both efficient and attractive; it certainly made an easy job of wiring up an aquarium. I have only two minor criticisms: as the unit is only supplied with about 6 ft. of cable, one's tank would need to be no further than six feet from a power point; a few more feet of cable would have been useful; the other criticism concerns one of the two air control knobs on one of the two units which I tested: it was impossible to turn with the finger and thumb; however, this was due to the hole in the unit's front not having been cut quite large enough; it was not difficult to remedy.

I would certainly recommend this new unit to those aquarists whose aquarium is situated in, say, a living room or sitting room, and who want everything to look neat and tidy—assuming they can afford £7·10 to be able to do so.

B. WHITESIDE.

OUR READERS WRITE

Constructive Criticism

In reference to an article in this month's *Aquarist* entitled, 'Making an All-Glass Aquarium' by Jorgen Hansen. I would like to add a few points of my own and describe, what I consider, to be an easier method.

Firstly concerning the cutting of the glass:

(a) A "clean" light cut with the glass cutter is far better than a heavy one. (Not that Mr. Hansen mentioned anything about the pressure of the cut). A good cut will "whistle" and a bad one "crunch" as it passes over the glass.

(b) If the glass has been cut correctly a firm tap on the underside of the glass, directly beneath the point at where it was cut, will fracture the glass along the cut and by bearing pressure on both pieces of glass, the two halves will separate.

(c) When grinding the sharp edges with whatever instrument you choose to use (I use an ordinary fine file) place the edge under running water. This will act as a lubricant and at the same time wash away all those little splinters of glass.

(d) Be very careful not to "round" the edges that are to be glued to glass as this will lead to a bad fit later.

Secondly, the glueing of the glass:

(a) All my breeding and stock tanks are glued together with the ICI's black silicone rubber, while my "show" tanks are glued with one of the "white" silicone rubber solutions.

(b) I have tried the method explained by Mr. Hansen, and while I agree that it looks nice, it is somewhat impracticable from the point of view of time and accuracy in the preparations required before glueing can commence.

(c) The method I prefer to use, and do so successfully is as follows:

(i) Cut the base glass first to the required dimensions.

(ii) Cut the two longest sides, i.e. front and back pieces so that their longest edge will fit edge to edge of the base.

(iii) Taking the two pieces, front and back, "sandwich" them together and place them at 90 degrees to the base and flush with the long edge. Measure the distance between the inside "join" and the other long edge; subtract 2mm from measurement (to allow for the thickness of the glue) and cut the two end pieces accordingly.

(iv) Taking one of the large pieces of glass, clean the bottom edge and the surface of the base where the glass will join, with methylated spirits. This cleaning process must be carried out with all subsequent joins, remembering that when you fit the "end" pieces there are THREE edges/surfaces to clean.

(v) Now, on to the clean edge squeeze a continuous thin bead of glue along the whole edge. Set the glass into place, making sure that the outside surface of the glass is square with the edge of the base. Apply a little pressure to bear down on the join, so as to ensure a good fit, and allow to set for five minutes. Make sure that the glass is kept as near as possible, vertical. While waiting for it to set apply glue to one of the ends; one side and the base of the end only.

(vi) By the time you have glued the edges, the first join will have set sufficiently to leave it standing without support, and the end may be fitted. Repeat the process with the other end. Do not worry about excess glue oozing out at the edges. Finally fit the other long side remembering to put the bead of glue on the ends on the "end" pieces and *not* on the face of the long piece.

(vii) Leave the tank to set for an hour, and no more than that. Taking a clean cloth and a scalpel or razor blade remove the excess glue taking care not to cut into the joins. Wipe all the corners with the cloth lightly soaked in methylated spirit.

(viii) Glue the inside of the tank as shown on the instruction leaflet; with the glue going in front of the nozzle. Leave to cure for three days. Excess glue may be removed with a sharp scalpel or razor blade. The silicone compound before it sets properly can be dissolved in methylated spirits and will wipe off any surface if done before it "sets" properly using this method.

I have, for my own curiosity, filled a tank measuring 15in. × 10in. × 8in. with water *before* I completed the glueing on the inside edge, that is to say with only the edges glued, 24 hours after I had finished the initial assembly—it didn't leak, and what's more it still hasn't; which only goes to show how strong the adhesive qualities of the glue.

Please do not think that I am unfairly criticising

Mr. Hansen, I merely wish to point out to the inexperienced aquarist that there are easier methods, and mine is one of them.

A little point worth remembering; if the glue will not flow freely, gently warm the tube before using. DO NOT use direct heat.

I hope readers will find this letter interesting and informative without being destructive to Mr. Hansen's article.

M. G. Owen,
14 Ash Close,
Walters Ash,
High Wycombe,
Bucks.

More about Cats

I am very surprised that B. B. Smith managed to have his letter published without comment from your experts.

The coldwater catfish usually being offered for sale around here are *Ictalurus melas*, and *Ictalurus nebulosus*, growing to around 18in. in nature with a maximum of 5in.-6in. in home aquaria. They are listed as nocturnal and as predators "which can hold their own against most species," and *are* capable of biting the hand that feeds them.

"Untruths" in aquaria literature are commonplace; yet it would be foolhardy, if one values one's fishes, to ignore the experience of others which gave rise to an assertion that a hazard exists.

As a case in point, I read that "if a Piranha is cut in any way, even a small nick on its body, it will be immediately torn to pieces by any other Piranha present in the tank." A possibility which I accept even though I have seen a Piranha with ½in. of skin torn from its side leaving the flesh exposed, swimming side by side with the Piranha (the sole other occupant of the tank) which had done the damage and, doubtless, enjoyed the morsel.

W. F. Clark,
56 Braeside Road,
Greenock,
Renfrewshire,
PA16 0RJ.

No Dissention in the Ranks

Being a complete novice to marine aquaria I joined the B.M.A.A. as a direct result of reading M. Strong's article in January 1973 *Aquarist*, and so far I received very long and detailed answers to queries from Graham Robertson the Editor of Marinews and John Vickere the Secretary. All in all I am 100 per cent satisfied with the help I've received from the association, and I would advise any one who keeps, or is contemplating keeping marines, to join the British Marine Aquarist Association, for the friendly advice and enormous help they give, will make it almost impossible to be unsuccessful in keeping marines. The Association deserves and will succeed in being the finest in the country and I am proud and priviledged to be a member.

John T. Sprague, B.M.A.A. 277,
14 Withycombe Drive,
Banbury,
Oxon.

Oodinium

I have been troubled for some time with *Oodinium limneticum*—Velvet Disease, and so far have only achieved partial cures in the planted aquarium. Contra Ick made by Tetra Care has been tried, the dose being repeated twice over a period of ten days, but without complete cures. Only an air store has been used during treatment, the underground filters being turned off.

It appears that many books will disagree on chemical cures, for instance, Mr. C. van Duijn Jnr. states that a good cure is immersion in 2-4cm. of 1% stock solution of Methylene Blue per Imp. Gallon over a period of 6-10 days would effect a cure. Mr. Derek McInerny states that immersion in a marine salt solution of 1 oz. per Imp. Gallon, increased if necessary by adding a further 1 oz. per Imp. gallon after 3 days in an unplanted aquarium will effect a cure. He also states that Methylene Blue will not cure *Oodinium limneticum*.

At present I am trying the salt method in an unplanted aquarium, but would like to enquire whether there is any information on killing the parasites in my fishless aquarium without harming the plants?

Most books state that it is not yet known for how long the motile parasites may survive before finding a suitable host. Being as both free-swimming and parasite forms of the organism contain some Chlorophyll, enabling them to obtain food by the process of photosynthesis, I was wondering whether 3 weeks in a planted aquarium, without fish, would be sufficient to kill them?

I would be most interested to hear any readers' observations on this subject.

Refs. Diseases of Fishes by C. van Duijn Jnr. Second Edition.
All about Tropical Fish by Derek McInerny and Geoffrey Gerard. Third Edition.

Derek J. Foxwell,
6 Denleigh Close,
Whitchurch,
Bristol BS14 9QL.

Inhuman Practices

I have become increasingly aware over the last few months, of the concern expressed by some of this country's leading importers of marine fish over the drugging and dynamiting of coral reefs.

Not only are some reefs in danger of extinction due

to careless destruction of all marine life, but marine aquarists are, (unless able to detect signs of drugging), in danger of purchasing certain fish which have little chance of survival.

However, despite your magazine having the largest circulation of its type in the country, I have yet to see you take a stand against these inhuman practices which, I understand, are the subject of legislation in some far-eastern countries.

You appear to have two experts, who so far have answered queries, on a fairly elementary level in the last few issues, but have yet made no statements concerning this problem.

There are in fact, many marine aquarists who still are ignorant of these practices and continue to purchase fish with damaged internal organs due to cyanide poisoning or other fatal drugs.

I appeal to you, firstly to print this letter and secondly, as a neutral body, to investigate this matter, and publish the results in a forthcoming issue.

R. D. Witham,
Chairman,
Matlock & District M.A.A.,
Enslin House,
10, Cobden Road,
Matlock, Derbys.

Editor's Note. An article on this subject by Messrs. R. D. Sankey and R. H. Lubbock, appeared in our January issue and as more information becomes available it will be given the space which matters of such grave importance deserve.

Seahorse Spawning

Dear Sir,

I wonder if any of your readers have successfully bred the Seahorse in a home aquarium and I would also like to know the name of the first person to do so, so I may contact him re. some queries I have regarding the species. There are so many varied "write-ups" in books that contradict one another, so to speak. I only have two small tanks (18×12×12), and keep three *Hippocampus kuda*, and they are all a lovely yellow/golden colour. I purchased them in May 1972 and each about 4½ in. long, two male and one female. They settled quite happily in the tank and although I had feeding problems at first, I now feed live young shrimp and prawns which I net at the coast and when these are not available, frozen Mysic shrimp.

On December 19th, the male produced about 50 young, born black and very small. (*see attached still-born young) and at the time, having only one tank, they gradually died off after two weeks, except one, which is still black, about 1 in. long now and living quite happily, feeding on brine shrimp! The adults are now nearly 7½" in. long and look like spawning again so, as I said, I'd be obliged to hear from anyone who has successfully bred them.

Thanking you,

R. Orton,
100 Hedgehope Road,
Newbiggin Hall Estate,
Newcastle-on-Tyne,
Northumberland.

** Mr. Orton enclosed 3 tiny specimens measuring $\frac{1}{16}$ in length.*

Care of Discus

I read with amusement and concern the letter from V. V. Pedlar, March issue, and J. T. G. Ohsner, January, 1973.

The letter from Mr. Ohsner demonstrates an apalling lack of knowledge analogous to a man feeling qualified to run a mink farm because his wife's boy-friend bought her a fur coat. In terms of maintaining quantities of fish it is almost unworthy of comment.

Their information if taken seriously can be both misleading and damaging to the enthusiastic beginner.

The information given by V. V. Pedlar does not surprise me any more than the fact that nearly every schoolboy has at some time kept a pair of pet rabbits in a draughty hutch at the bottom of the garden. If little Jimmy's bunnies are found dead one morning, mummy will tell daddy to go make a fine new hutch and buy a new bunny and all will be well. If, however, little Jimmy has also 300 does and 2,000 six-week-old up-and-coming young rabbits, an epidemic started by two dead pets is not particularly funny when dad digs 2,302 graves. The concern for health, a balanced diet and high standard of cleanliness is the aim of every livestock breeder everywhere.

With regard to an unbroken diet of white worms of doubtful food value and with various protein and vitamin deficiencies, I would ask V. V. Pedlar if he would like to live the rest of his life-span on nothing but fish and chips, an experiment I would dearly love to carry out if this is the extent of his concern for a living creature.

When it comes to a question of brains, I have no doubt that if his Discus proved to have an I.Q. of 110 the difference they could make to their own environmental conditions would be very little, thus leaving little doubt as to where the grey matter should reside.

The proof of a pudding is in its eating they say! With a lot of help from the family between December '71 and June '72 we bred near to a 1,000 Discus and nearly as many *Ramirezi*.

How many fish did both gentlemen breed of *any variety* during that same period?

R. H. Cooke.
Wormingford,
Colchester,
Essex.

THE ALEXANDRA PALACE FIFTH FISHKEEPING EXHIBITION

NOW THAT we are fast leaving behind what has been a relatively mild winter and spring, our thoughts are turning towards summer, and for Aquarists, the onset of a new show season.

Without a doubt, the Aquarist & Pondkeeper's Fishkeeping Exhibition has become the highlight of the summer scene.

The Federation of British Aquatic Societies is actively engaged in organising the benching of this Show, and they are confident that the weekend of 14th and 15th July will witness the best show yet!

In the past, interest has been widespread, and entries have come from overseas, as well as from most parts of the United Kingdom. It is fully expected that this pattern will be repeated, and some of the excellent large trophies available may be in for some long journeys after the Exhibition has closed. Once again it is hoped that Furnished Aquaria entries will be very strong, and they have been an outstanding feature of this Exhibition. It may well be though that they may be rivalled by the Aquascapes, which could turn out to be the highlight of the Show. A high degree of designing skill is shown in these entries.

As usual, many classes of fish will be on view, and will include a strong entry of sexed pairs.

All exhibits will be carefully looked after night and day, by the Show Stewards, who will be under the expert supervision of Mr. Dennis King, F.B.A.S. There are already a few names on the Stewards panel, but more are needed. The Show Secretary, Mr. D. Lambourne, F.B.A.S., of 7 Weeller Court, Plough Road, London, S.W.11, will be pleased to hear from anybody who is willing and able.

Publicity material is available and the Show Organisers will be pleased to supply any aquarist with a Car Sticker and Posters on request to: **The Show Organiser, The Aquarist and Pondkeeper, The Butts, Brentford, Middlesex. Tel. 01-568 8441.**

Entry forms are available from Mr. D. Lambourne, whose address appears above.

Alexandra Palace is a famous landmark, seated on the heights of North London, at Muswell Hill, and the view of the Metropolis from this wonderful vantage point is truly magnificent. It is the centre of a vast open area of parkland, and is easily reached by road, rail or bus. There is plenty of free parking space, and is an ideal spot for coach parties, with plenty of picnic spots in the adjacent countryside.

Entries will be welcomed from any fishkeeper, and the Federation calls on its affiliated societies to do their utmost to be represented by a strong entry from their members. Make it a date, but don't make it late!

A. O. TOMKINS,
Chairman, F.B.A.S.

DON'T FORGET THE DATES—JULY 14th and 15th, 1973

Our attractive two-colour car sticker

All applications for car stickers or other advertising materials should be made to THE SHOW ORGANIZER at the address given below and plainly marked "EXHIBITION PUBLICITY"

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All Enquiries to: THE SHOW ORGANIZER, THE AQUARIST AND PONDKEEPER, THE BUTTS, HALF ACRE, BRENTFORD, MIDDLESEX, TW8 8BN.

From a Naturalist's Notebook

by Eric Hardy

OF ALL botanical masterpieces, the microscopic diatom excells. Its skeleton, almost as varied as the kaleidoscope in single-celled algae, is the triumph of the plant-plankton in our ponds and the sea. Diatoms occupied the evenings of Victorian microscopists. The muddy Mersey estuary has often been called Britain's most polluted river, though its harbours are among few in the world where "shipworm", the burrowing *Teredo* mollusc, cannot exist to harm its dock-timbers, and a way of ridding vessels of the marine life on their bottoms was to moor them in the Manchester Ship Canal which killed any polyps and nauplius stages of barnacles adhering; the estuary still has a very varied flora of diatoms.

From tidal mudbank pools in the estuary at Estham, by the entrance to the Manchester Ship Canal, a friend recently sent me a list of 26 diatoms he had identified in 1972 plus a further 20 species from mud excavated from the Queen Elizabeth oil-duck, just inside the canal. He projected several slides of them, and although fewer than the diatoms he has identified in the cleaner Dee estuary on the other side of the Wirral peninsula, it is, nevertheless, a useful list.

His method is to sample about 50 cc of mud or sand, shaken with water and allowing it to settle a couple of minutes, when the fluid is poured off and its residue of sand and large particles discarded or, after examening for diatoms with chlorophyll like mobile *Nitzschia* and *Navicula*. The remainder is filtered (200-300 per inch) to remove clay particles, then boiled with sulphuric acid, washed and the sediment mounted on microscopic slides. These contain columns of clay and silica-particles as well as the diatoms. The diatoms are named from N. I. Hemdrys "Introductory Account of the Smaller Algae of the British Coastal Waters", Pt V. (HMSO, 1964); but sub-species are difficult, as are the very small *Naviculae*.

These, of course, are only a small section of the vast number of marine diatoms which play a part in sea-life, some of which form a film to colour yellow the belly of the great blue whale, for instance.

The commonest Mersey species, with several specimens on each slide, were the somewhat rectangular *Pinnularia rectangulata, Coccinociscus radiatus, Biddulphia rhombus, B. regia, Actinoptyclus senarius, A. octonarius, Surmella gemma, Navicula monolifera* and long, narrow *Nitzschia granulata*. Others in the tidal mud were: *C. lineatus, B. aurita, B. mobilensis, Podosira steliger, Navicula ergadensis, N. atlantica, N. crucifera, N. tuscula, Melosira monoliformis, Asteromphalus heptactis, Raphoneis surinella, Triceratum favus, Gerasigmia wansbeckii, G. hippocampus, Caloneis westii, Pleurasigma angustatum* and *P. aesturii*.

All the diatoms from the excavated dock-mud were dead, and had obviously been in the sewage-contaminated bed a long time. The commenest there were *Navicula tusculata, Nitzschia accuminata* and *N. insignis*. The others here were: *Pinnularia ambigua, Amphiplora alata, Navicula palpbralis, N. lyra, N. humerosa, N. inflexa, N. elegans, N. ergadensis, Pleurosignia angulatum, Surirella gemma, S. ovatus. Actinoptyclus senarius, Caloneis subsalina, C. westii, Coscinodiscus eccentricus* and *Cocconeis scutellum*.

Fish are increasing slightly in the Mersey estuary with a lessening of pollution, for not only was a haddock taken the other month in Birkenhead's Morepth Dock, but a saury pike was claimed off Egrement, and more bass were on the Seacombe-New Brighton side last summer.

We tend to think of fish-keeping in the Manchester area in terms of Belle Vue; but Manchester University's public Museum, in Oxford Road, has an excellent modern aquarium and vivarium. The countryside around is not without special waterlife interests. I recently visited the churchyard at Rostherne, just off the Altrincham-Northwich road, where the very deep glacial lake, a richer haunt of Phytoplankton than the Mersey, is the haunt of 5 different mayflies and 8 species of dragonfly, including a modern immigrant, *Symphytrum fonscolombei*. Blue-green algae "bloom" here and on nearby 30 metres deep Mere Mere, from June to autumn, as on Ellesmere meres.

I then visited private Tabley Mere, on the other side of Knutsford, where the smaller of the two meres, by Moat Farm at the school end, is a great haunt of yellow water-lily, whereas only two or three patches of native white water-lily grow at the bigger mere across the park.

From the cloud forests of western Guerrero in Mexico, Adler and Dennis have described two new tree-frogs, *Hyla trux* and *H. mykter*, while from Venezuela, J. A. Riverso describes a new Caribbean frog species *Osteocephalus leprieurii*. Sloughing of snake-skins, a well known phenomenon, has been shown by Hong Kong university biologists to be linked in the garter-snake, and probably others, with thyroid gland secretions. Few people seem to have observed snakes eating their cast skins, but this

occasionally occurs, probably influenced by their reptile-eating habits. It isn't at all regular, however. None of the snakes seen to do this have been seen to repeat the act. I was surprised that a Canadian naturalist recently recorded apparent death-feigning by a toad as if it were unique. More interesting was an observation of an American arboreal green pit-viper twitching the pink end of its tail in the presence of lizards, until it successfully lured an anole lizard within range. However, the red tail of an Asiatic pit-viper is used in a stress-provoked protective display and the rattlesnake's use of its tail in threat display is well known.

More homing experiments with American toads, up to 235 metres, showed that neither blinding nor removal of the olfactory (smell) tracts altered their successful abilities. They orientated as well under clouded as clear skies. Marking with a trailing device showed how some returned by indirect routes instead of the quickest way, moving first to a shoreline before turning homeward. This might suggest a humidity direction.

Piranhas are well-known attractions at fish-shows and sometimes get a sensational write-up by the lad from the local rag. An American Press exaggeration of the piranha danger in Brazil induced the Brazilian government to put the facts upon the table about its pisciculture department's progress, without much expense, in controlling these fish by poisoning them with 6 per cent rotenone ("timbo" powder) at 3 ppm. This fish, *Serrasalmus*, which grows to 14 inches or so in the Jaguaribe and Acarau rivers. In only 4 years it was exterminated from 10 dams including the Jaguaribe's big Oros Dam, draining much of northeast. Fishermen in the Ceara state rivers have fingers mutilated and sometimes children receive scars or even severe leg-wounds from bites when bathing. These rivers flow only in the rainy season, but small lagoons and dams remaining in their beds during the dry season are teeming with piranhas, a serious danger to stock, even eating an entire horse except for the skeleton.

The piranha's eggs, *larvae*, young and adults were all killed within 11-15 minutes of application of rotenone, after first reducing the volume of water in the dam for economy. The poison is selective for piranhas. 72 hours after poisoning the Varzea de Boi dam up the Jaguaribe valley, 60 dynamite charges were blasted off in the dam, and 7 different fish-species collected included Cichlids, Loricarids, Characids, Pimoledids and Poecilids, which had survived the rotenone strength. Restocking wasn't necessary. As piranhas don't leap or jump, barriers were built across the dam-spillways to prevent downstream fish from recolonising the dams.

Have you noticed the quick alarm-reactions of some fish which swim away rapidly, or even jump, from foes or disturbances? In the U.S., the chemical releasing this instinct has not only been isolated from suffocated top smelt (*Atherinops affinis*), but when introduced into an aquarium of smelt it caused a strong reaction of alarm, including several seizures. Extracts from other species caused only mild excitation in the smelt, so that there appears to be a specific differentiation among the chemical stimulants.

KEEPING CLOWN LOACHES

by R. E. Simmonds

SOME FIVE months ago I paid a visit to one of London's many tropical fish shops, mainly with the intention of comparing the fish and their prices with other premises in the London area. I believe in visiting as many shops as I can as one is then able to obtain the best specimen for the most reasonable price. However, on this occasion the tank which caught my eye contained a large number of the very colourful fish, *Boria macracantha*, the Clown Loach. They were about ¾ inch in length, and as I have usually found

with this particular specie where a large number are kept together, were very active.

Anyone who has seen this loach, I think, will agree that the colours are so striking, that providing a tank of suitable size can be found, they are a must for the home aquarium. I therefore purchased three at a cost of 65p each.

On returning home my three Clowns were placed in a 48in. × 15in. × 15in. tank, the water, which was from the tap, was heated to a temperature of 76 degrees. The tank was lit by a 4in. Gro-lux tube which, with a good background of plants, really brought out the rich yellowish red and black colours of this fish. Suitable rock hiding places were provided, but after a settling in period of about ½ hour, the three of them started to explore, which took them to all levels of the tank. Feeding commenced with a good helping of *Tubifex* worms which they settled down to enjoy, and to date their meals have comprised the following assortments:—prawn, cod roe, fish glass-worms, well ground chicken, meat, and the occasional earthworm. Whilst they readily eat *Tubifex*, I am not too keen on feeding this food to any of my fish due to adverse remarks which, over the years, has been written about these worms, so my fish only get fed this about once a month. Clown Loaches will take dry food, i.e. flake or pellets, but I only feed this as a supplementary food. They are peaceful with other fish, and on one occasion I placed a dozen Neon Tetras into the same tank but no aggressive behaviour towards the Neons was witnessed. Obviously larger fish are more suitable companions for Loaches which, given sufficient tank space, should grow to about 4-4½ inches. Unlike some members of the *Botia* family, light does not seem to bother Clowns as they are continually on the move in the aquarium, either grubbing around the gravel or swimming three in a line around the lower to middle regions of the tank.

Whilst my three Clowns are far from being anything like fully grown for tank kept fish (mine now are about 2½ inches), I have noticed that of the three, two appear more deeper bodied, so perhaps this may be a basis for sexing these fish, the deeper bodied as with most species of fish, being females. I have read in McInerney's book 'All About Tropical Fish' that he also puts this theory as a possible way of sexing these fish. It has been written before that Clown Loaches are very prone to white spot and this I can confirm. I recently broke the golden rule regarding the quarantining of new fish, by introducing straight into the Clown's tank a couple of Giant Danios (*Danio malabaricus*) which, whilst not showing any signs of spot, must have come from water containing the parasite. This soon showed on the Clowns, but instead of raising the water temperature as stated for this Loach, I tried a mild dose of Malachite Green, and within 48 hours a cure had been effected. Providing one treats mildly with chemical dyes in the Aquarium, I have not personally found that any harm results to these Loaches.

Providing a varied diet is given and care is taken in supplying tank conditions to their liking, Clown Loaches will give their owner many hours of enjoyment with their antics, also the colour of these fish is such that they can compare with some of the glorious colours seen among members of the tropical marine community.

What is your opinion?

continued from page 41

"To this day the water has kept crystal clear," says Mr. Loten. The tank in question is 48in. x 12in. x 15in., has been in use for six months, and houses the now 7in. long Oscars. His first attempt at cleaning the tank was carried out using an outside box filter operated by a Rena 100 pump. Mr. Loten considered that the pump was not powerful enough to work his particular filter efficiently, and it did not clear the trouble. Using the underground filters, Mr. Loten found that they did not affect plant growth either one way or the other. He says that these filters do not seem to rob the plant roots of nourishment, as is sometimes stated. Standing by he also has an Eheim 386 power filter, and he says that it is invaluable to those who have several tanks, and who do not have a lot of time to look after them. He also uses this filter on any tank in which the fishes begin to look "drowsy"; it seems to perk them up. He sums up his points by saying that he uses internal box filters for tanks of under 2ft. in length; for larger tanks he uses an Algarde, with a power filter standing by when required.

Mr. Loten would like to have readers' opinions on the Cichlid, *Chaetobranchopsis bitaemiatus*. He says that Sterba says the fish is peaceful, and does not grub up the bottom of the tank; his fish has been the exact opposite and is now quite boisterous. His fish is living with a large barb, a pair of firemouths and a blue acara. His fish is light grey in colour with a dark band extending from the eye to the caudal peduncle. The iris of the eye is red, and the fish has red spots on the anal and ventral fins. Halfway down the body, close to the dark band, is a black blotch. Mr. Loten would like to know if he has identified his fish correctly as its behaviour seems to contradict what Sterba says—if the identification is correct.

Photograph 2 shows the golden barb. What have been your experiences with the breeding of this species?

For a future edition, please send me your opinions on the following: (*a*) What have been your experiences with the breeding of common goldfish? (*b*) Have you had any experience of keeping terrapins in the same tank as fishes? (I recently saw one large tank which contained a terrapin, a Koi, several goldfish and a wide variety of common large and small tropicals—ranging in size from large Oscars downwards. I could hardly believe my eyes when I saw the whole collection happily sharing the same, tropical, fresh water tank!) (*c*) What is the best food on which to feed whiteworms? (*d*) Have you yet managed to successfully breed *and raise* neons or cardinals? (I've asked this question several times but have yet to receive any useful answers.) I look forward to hearing from you, but do remember to print your name and address, date your letter, and don't make it too long—please! And more power to your filters, as one reader recently wrote at the end of his letter to me.

Apistogramma cacatuoides

by David Seymour

THIS SOMEWHAT scarce fish is found naturally from British Guiana to Surinam in soft, slightly acid waters. Males of this species of dwarf cichlid grow to about 3in. while females are rather smaller, only reaching 2in. overall.

The following ray counts were obtained from a male A. cacatuoides in my possession; D XV/5 A 111/7. The general description of males is as follows. The body is basically brownish, with a yellow belly and throat. The head is rather large with several horizontal bands running from the mouth over the snout and head to the first rays of the dorsal fin. These bands occasionally continue vertically on the body to the base of the caudal peduncle. The eye is black and has a dark streak running from it to the base of the gill cover. Body scales appear to be edged with a darker shade of brown, giving the fish a reticulated effect. All fins are a bluish sheen, including the pectorals which are also tipped with yellow and carry elongated tips. The caudal fin also carries the reticulations found on the body and is lyre-shaped—the top and bottom rays being longer than those in the

centre. The dorsal is high and the second, third and fourth rays are greatly elongated. The mouth is wide and the lips are a bluish shade, reminding one of certain Tilapia spp. A rather blotchy dark line runs laterally from the opening of the gill-cover to the caudal peduncle. Females are about one inch shorter and do not carry the exaggerated finnage of the males. The basic coloration is a yellow-brown with a dark blotch on the nape and several incomplete horizontal lines on the back and belly. The ventral fins are yellow with a dark leading edge. The female of this species is somewhat similar to the female A. agassizi.

The following is an account of the method I used to spawn these fish. An all-glass 18 × 10 × 10 aquarium was set up using a mixture of tap and de-ionised water to give a hardness of DH 4 and a pH reading of about 6·8. Several plants of V. spiralis and Indian fern were rooted in fine gravel about 2½in. deep, which covered one of the newer types of under-gravel filter. A medium sized flower-pot split into two longitudinally was introduced into the tank to form a couple of low arches and the temperature was raised to between 78-82 degrees F. A 25-watt lamp illuminated the interior of the tank and was kept burning for approximately fourteen hours per day. The pair of cacatuoides were introduced and very soon settled in. Feeding these fish did not present any difficulties as they accepted several varieties of the flaked type of foods, as well as tubifex and cooked chopped chicken and cod. The only food I found they would not eat is the blocks of freeze-dried tubifex, although the loose F/D worms were eagerly taken, as was the odd small spider and housefly.

During the pre-mating play the male chases the female and displays to her with a beating motion of the body and outstretched fins. If the female is ready to spawn the pair will enter one of the flower-pots and deposit between 50-100 small light fawn eggs on the underside, presumably this being a pre-cleaned area, although I have never witnessed the actual cleaning of the site. Once the eggs are deposited the female assumes control and in no uncertain terms lets the male know that his function in the spawning procedure has been completed. It is now that the darker markings on the body of the female intensify and she becomes extremely belligerent towards anything that approaches the vicinity of the flower-pot.

I usually remove the eggs for artificial hatching, as I have found the female to be a very unreliable parent. Sometimes she will carefully tend the eggs until they hatch, but then she will devour the fry, although occasionally the eggs themselves are eaten as soon as the spawning is finished. When artificially hatched losses are usually about 10%, mainly in the egg stage although I have succeeded in hatching and raising 100 per cent of several spawnings. When the eggs are removed from the spawning tank I place them into a small tank containing some of the original water and several drops of methylene blue. I then cover the entire tank with a cloth to exclude light as the eggs seem to be fungus-prone in a lighted situation.

The eggs hatch in 4 days at 80°F., and the alevins are free-swimming in a further four days. The fry are very small and colourless for a while, so frequent small feedings of newly hatched brine shrimp are called for. The growth rate of baby Apistogramma cacatuoides is very slow—the usual size at four weeks of age is barely three-eighths of an inch overall, although at this size they can be weaned onto other foods such as finely minced enchytrae and very fine proprietary flaked and F/D fare. Thereafter, growth seems to speed up slightly and the fish become sexually mature at about six months.

Further information on this rather plain but interesting dwarf cichlid is limited, so if any readers can provide additional details I shall be pleased to hear from them.

HERPETOLOGICAL NOTES

by Stephanie Peaker

Anoles

THE GREEN ANOLE or "American Chameleon" (*Anolis carolinensis*) is often the first lizard the amateur herpetologist may keep. Far from being a chameleon, this lizard is a member of the family Iguanidae like so many lizards from the New World. It is the species that is most commonly imported and occurs in the southern parts of the U.S.A., Cuba and the Bahamas but the anoles as a group are abundant in tropical north, central and south America and comprise over a hundred species. One of the most striking features of these lizards is the throat-fan of the males, which is often red, orange or yellow. In females, however, the fan is small or even only rudimentary and only the

males use it during courtship and territorial behaviour as a means of display. Most anoles are at least partly arboreal and this should be remembered when designing and constructing a vivarium to house them. Like the geckos, anoles have toe-pads to assist in climbing but their abilities in this direction do not quite match those of most geckos.

Anoles can change colour fairly rapidly, usually from brown to green but this occurs not so much in response to background coloration but more to temperature, lighting conditions and emotion. It is this ability to change colour that has led the Americans to call them "chamaeleons" and even professionals, who should know better, use the term. Pet shops often used to advertise *A. carolinensis* as a chamaeleon; I wonder whether this now contravenes the Trades Descriptions Act?

The vivarium for anoles should be as large as possible preferably containing plants with large leaves under which the lizards can hide. A choice of lighting is also an asset, some parts of the cage being very light and other parts shaded. There is certainly no need to waste space since branches and leafy twigs can be provided right up to the roof. The floor can be covered with peat moss and pieces of bark positioned so that the lizards can hide under them. A water bowl should be provided but it is also advisable to spray the leaves in the vivarium every day since many will only drink by lapping water from vegetation.

I would suggest that a group of these lizards should be kept since courtship and even mating and egg-laying will occur. However, care must be taken with the number of males introduced since serious fighting can occur in a small vivarium. A large vivarium at a day temperature of about 75-80°F is recommended for the Green Anole but it is advisable to let the temperature fall to about 65°F at night.

Green Anoles usually cost about £1 and grow to a length of 5-7 inches. Other species are sometimes available and since these are found further south, slightly higher temperatures are preferable. For example, I have seen Sagra's Anole (*Anolis sagrei*) which is brown in colour, advertised in Britain. This species was found only on Cuba, the Florida Keys and the Bahamas but has now been introduced into Florida, Jamaica and British Honduras. Another species, *A. roquetextremis*) from Barbados has also been imported.

An extremely attractive Cuban species is sometimes available from dealers and this, which is known as the Knight Anole (*Anolis equestris*), grows to a length of 18 inches (although most of this is tail). I have seen large specimens advertised at £7. A large vivarium is, of course, essential for this, the largest species of *Anolis*, as well as some other large species from other West Indian islands that may be imported.

Finally, I would recommend that anoles should be purchased in summer. Like many species from the tropical parts of America they are not used to low temperatures and a few hours of exposure to winter temperatures when travelling can prove fatal. It is also easier to ensure that a wide variety of insect food is available during summer when the lizards first arrive.

Eastern Toad

The Common Indian Toad (*Bufo melanostictus*) has a very wide distribution throughout Asia. The brown body is covered with black-tipped tubercles and the head is sculptured with raised black lines. Like most toads this species is active in the evening, particularly after rain. Growing to about the same size as the European *Bufo bufo*, it can be treated as a typical toad but it does, of course, need a tropical temperature (75-85°F). An ideal vivarium for this toad would contain live plants and a small pool with plenty of cover available. For floor covering I prefer natural woodland litter since it can be kept drier than peat without becoming too dusty. Ventilation of the vivarium should be good in order to prevent an excessively high humidity. Like most toads it soon becomes tame and it is an attractive common species that can be recommended.

Snakes and Food

The way in which snakes control their food consumption has long fascinated herpetologists and a recent paper in *Physiology and Behaviour* (vol. 6, p. 71, 1971) by Dr. J. S. Myer and Dr. A. P. Kowell of the Department of Psychology, Johns Hopkins University, Baltimore, throws some light on normal food consumption, body-weight and the effect of food deprivation in the Florida King Snake (*Lampropeltis getulus floridana*), housed at 27°C. Excluding the sloughing period, the snakes usually ate every four to six days with three to four mice for each meal. The snakes drank almost every day. During a six-week period when no food was given, they lost weight only very slowly showing that, as we have known for a long time, snakes can go without food for long periods without apparent ill effect. However, after this period of food deprivation, two snakes did not resume their regular feeding habits and one did not accept food for eight months. The authors of the paper were not sure of the reason for the loss of appetite but they suggest that there may be an annual cycle of food intake although the possibility that food deprivation seriously affects appetite could not be ruled out. I rather favour the latter explanation from our own experience with snakes and always try to ensure that snakes are offered food regularly since I feel that snakes are often fed too little and too irregularly and that this may be one of the causes of "hunger-strikes."

Junior Aquarist

THE HARDY EUROPEAN REPTILES AND AMPHIBIANS IN CAPTIVITY (Part 12)

by Andrew Allen

24. The Grass Snake (*Natrix n.natrix*)

Description.—Male specimens may grow to about a metre in length, while females are usually larger and stouter with lengths of up to about 1·5 metres. The body is slender, the head is high and ovoid. The species exhibits enormous colour variation, with a grey dorsal surface the rule, but melanism a common phenomenon. There may be longitudinal rows of black dots, or two pale dorsal stripes. On either side of the back of the head is a crescent-shaped patch in yellow or orange, often bordered in black. Ventrally it has dark squares scattered over a light, cream or grey background.

Distribution.—*Natrix n.natrix* is the Central European form of the Grass snake, with a range that includes Germany, Poland, Czechoslovakia, West Russia, the North-East Alps and Scandinavia. It frequents many different habitats, all of them sunny, and prefers to be near water.

Breeding Habits.—Mating takes place without excessive preliminary display or courtship. Between eight and thirty (sometimes many more) calcareous white eggs are laid in piles of rotting vegetation that act as natural incubators.

Care in Captivity.—The Grass snake is one of the easiest of ophidians to keep in captivity, and rapidly settles down and becomes tame. At first specimens may hiss and bite, or void a nauseous fluid from the cloaca when handled, but with the exception of certain old females they usually cease these antisocial habits within a week.

Though better housed in an outdoor vivarium, this species should also do well indoors. The vivarium should be large and well ventilated, and placed in a sunny position (but partially in the shade to avoid overheating). Supplementary heat and light can be provided by means of a small barrage of electric bulbs of low wattage. Opinion differs as to whether a small pool should be kept permanently in the vivarium, Undoubtedly it is the more natural and attractive arrangement, very much to the taste of the inhabitants. who greatly enjoy a drink and a swim. But on the other hand it can lead to an excessively humid atmosphere that adversely affects sloughing and can cause a variety of ailments. So if possible a large water bowl should be available, but otherwise the snakes should be removed each day to a suitably arranged aquarium where they can have a long drink and a good swim. The vivarium substratum can be gravel, soil or peat, though the latter does tend to mar the beautiful living colours of this snake. A large and carefully stabilised pile of stones will furnish an abundance of hiding places, and several flakes of bark scattered haphazardly will also make fine shelters. Some good rugged branches will provide climbing room, and also help with sloughing. Tastefully designed and disguised pots of greenery can add the finishing touches to an attractive arrangement.

However, an outdoor reptiliary is indisputably the premier home for these animals. It should be complete with a very large pool, a hibernating chamber, rocky shelters and a selection of small shrubs. Under these conditions the inhabitants will thrive royally. A greenhouse is not to be recommended with such emphasis. If a pool of the necessary dimensions is supplied, the humidity of the air will soon build up to totally unacceptable levels. This can be countered by replacing several panes of glass with perforated metal sheeting to establish a regular flow of air. This is not a course of action to be undertaken lightly, for there will always be some danger of the snakes rubbing their snouts against the mesh and causing damage that can lead to infection and death. Best then to avoid the greenhouse, for the extra warmth and

Grass Snake

protection that it supplies are surely superfluous to a species as hardy as the Grass snake.

In general snakes are the most difficult of all the Reptilia to feed with ease and success. But among the snake clan *Natrix n.natrix* poses fewer problems than the majority (a) because it tames readily and rarely indulges in hunger strikes, and (b) because it will accept such a wide variety of offerings. At first it will take only live-food, but it can usually be weaned on to more convenient dead foodstuffs. Small fish such as minnows, sticklebacks and guppies are possibly the easiest live-foods to obtain, and they need simply be liberated in the vivarium pond where they will be stalked and captured with great perseverance and sagacity. Frogs, newts and tadpoles will be accepted with equal enjoyment, while raw meat and sea-fish may be taken by some specimens. Mice are usually rejected, as are all kinds of insect fare. Prey is hunted both on land and in the water.

The Grass snake will fit comfortably into most communities of large snakes of similar hardiness. In this context we may mention Dark Green, Aesculpian, Viperine and Dice snakes. Adult Eyed lizards, Glass snakes (*Ophisaurus* sps.) and all the land tortoises can also be accommodated with it, but small lizards, frogs, toads and newts should all be strictly avoided.

This species is perhaps the best of all for the amateur who is just commencing his experience with snakes. It is easy to house and feed, tames readily, and rapidly becomes established in the vivarium. It can be recommended with every confidence.

Most important sub-species is the Barred Grass snake (*N.n.helvetica*), powerful of build and growing to a full two metres in length, and usually possessing yellow neck patches. It is the Western European form of the species, coming from Britain, France, West Germany, the Low Countries and much of the Alps. It is the sub-species that the amateur is most likely to encounter, and requires identical treatment to the type.

Other sub-species are the Spanish Grass snake (*N.n.astreptophora*), *N.n.cetti* from Corsica and Sardinia, *N.n.persa* from Asia Minor and the Balkans, *N.n.schweizeri* from Milos, *N.n.scutata* from the extreme East of Europe, and *N.n.sicula*, an inhabitant of Sicily and Southern Italy.

25. The Dice Snake (*Natrix tessellata*)

Description.—This is a slender snake, growing to a metre or so in length, with a long narrow head. Dorsal coloration is grey or brown with a pattern of square markings, sometimes arranged in rows. There is a forward-pointing V-shaped marking on the neck. The undersurface may be yellow, brown or red, usually chequered with black.

Distribution.—The range of this species is extremely wide, for it may be found in Italy, Austria, Switzerland, West Germany, Czechoslovakia, Hungary, the Balkans, the Caucasus, South Russia, Asia Minor and across mainland Asia to North India and West China. It is

nearly always reported close to open water, and is a very accomplished swimmer.

Breeding Habits.—These are similar in most respects to those of the Grass snake. Up to twenty-five eggs are laid in soft soil or rotting vegetable matter.

Care in Captivity.—This Colubrid is very closely related to *Natrix natrix* and in outline its care should be the same.

However, it is an even more aquatic species, and spends nearly all of its life in or near the water. The vivarium must be supplied with a large and deep pool, preferably fully equipped with plants, gravel and rock. To ensure that the atmosphere remains suitably dry, ventilation must be continuous and efficient. Though it is a fully hardy species, additional heat and light must nevertheless be provided, as must ample branches for climbing. Like the Grass snake it prefers the more spacious and airy conditions of the outdoor reptiliary, where it will prosper comfortably as long as it has access to a full-sized pond.

The Dice snake takes much the same range of food as its close relative, favouring fish, frogs and newts. Initially it may only take live prey beneath the water, but can sometimes be encouraged to transfer its attentions to dead animals on the land. To bring about this desirable state of affairs a great deal of patience is the order of the day, combined with a thoroughly equable temperament. *N.tessellata* will slot nicely into the same communities as the Grass snake, and can be relied upon to cause a minimum of trouble.

This is equally a species that can be commended to the amateur, attractive in appearance and lively and engaging in its habits. If it is a shade more demanding than our own Grass snake, it is also slightly more exotic, surely a compensating virtue to those with the time to spend upon it.

There are no sub-species.

26. The Viperine Snake (*Natrix maura*)

Description.—As its name suggests, *Natrix maura* bears a superficial resemblance to a Viper, though close examination rapidly dispels this initial impression. As in many of its relatives, the female is considerably larger than the male, growing up to a metre in length. The body is slender, coloured grey-brown or red with darker markings that may form a zig-zag arrangement. Laterally there are rows of eye-spots with light centres. Ventral coloration may be green or grey, with dark patches that form no definable pattern.

Distribution.—This species comes from South and West Europe, notably the Balearics, France, Corsica, Sardinia, Southern Switzerland and North-West Italy. Like *N.natrix* and *N.tessellata*, it lives in or near the water, and is very aquatic in its habits.

Breeding Habits.—Up to twenty eggs are laid; sometimes these show a faint greenish tinge.

Care in Captivity.—There are no problems here. Those with experience of Grass or Dice snakes will find its needs to be very similar and quite simple. Like them it prospers best in the outdoor reptiliary, feeding on the same range of fare, settling down with the same companions in a community vivarium. Indoors it can be housed in a perfectly dry container as long as it has daily access to water. In winter it is best allowed to hibernate. The vivarium can be filled with paper, leaves and dry moss and transferred to a cool, frost-proof outhouse. Alternatively the snakes can be moved to a separate hibernating box which should be treated in the same way. Conditions should be maintained as dry as possible if the inhabitants are to emerge full of robust good health in the spring—when one of their first requirements will be a long drink and a swim.

The Viperine snake completes a trio of animals that will bring joy to inexperienced and expert alike, the most satisfactory of all ophidians as inmates of the vivarium.

There are no sub-species.

The next article will consider the remaining hardy European snakes, notably the Aesculapian and Dark Green or Angry snakes.

THE CONVICT CICHLID

by G. Pope

It is popular opinion amongst the cichlid specialists that the Convict Cichlid is a fish with an unpleasant temper and aggressive tendences.

For this reason, the Convict Cichlid is not widely kept, and possibly not appreciated as an interesting fish. It is also claimed to be of dull coloration—

which is a matter of opinion. Although I do not dispute its pugnacious temperament, I think it is still a worthy member of any cichlid collection.

The Convict or Zebra Cichlid—*Cuchlasoma nigrofasciatum*—grows to a length of about 10cm., and in the wild it is found in profusion in Guatemala, Salvador, Costa Rica and Panama. It was first imported, and thus made known to European aquarists in 1939, and has been fairly readily available ever since.

I bought my first pair from one of my local shops, and brought them home to a 24in. × 15in. × 12in. tank in which nearly all my new fish are housed, temporarily, until I was able to prepare a 36in. × 15in. × 15in. tank, as a permanent home. In the two foot tank, which simply contained gravel and rock shelters, they did not look either happy or particularly interesting, but I am convinced that many "dull" fish, given carefully planned aquaria specially designed, can show a far better degree of both colouration and vitality, than when housed in tanks laid out for the general use of "keeping fish."

In the three foot tank I put a coarse grade gravel, sloping from 6in. to 4½in. depth. In one corner I placed a large plastic Amazon Sword—although I prefer real plants, the convicts would soon have made short work of them—and a selection of rocks. A piece of well soaked tree root, with several sizeable branches on it, was placed at the back of the tank, about four inches forward to the dark green painted back pane of glass. This gave a false back to the tank, which later proved useful as a refuge. A large flat piece of dark grey slate was put amongst the gravel, also sloping slightly.

The tank was lit by means of two 20-watt Gro-lux tubes clipped into the hood, and an Inter-pet hose filter installed, powered by a Rena 300 pump.

By the time the fish were introduced into the tank, they had recovered from the shock of travelling and were feeding well on a variety of meaty food.

The fish settled in very well, and their diet included *Tubifex* worms, ox-heart, liver, dog-meat, daphnia, white-worm, various freeze-dried food, Tetra-min and also vegetable food in the form of lettuce, duck-weed and the chopped outer leaves of Brussel sprouts!

I had picked out my two fish from the dealers tank as they were swimming around together, and generally seemed to be interested in each other. Judging by this behaviour, I thought the chances of their being a pair were good. However, they were unequally matched in size—one was about 9cm., the other only 5cm. I was obviously taking a risk with this difference in size, particularly as they were more than prone to the nastier habits of "Cichlasoma". However, I was prepared to take this risk, particularly as the fish were marked at such a low price.

After the fish had been in this tank for about two weeks, feeding heartily, the smaller of the two became darker in colour, its belly becoming a slightly orange colour. Soon after this, both fish were showing a breeding tube, and, by comparison, I was able to establish that the larger fish was the male, and gradually his colour deepened. Under the Gro-lux lighting and in this breeding condition, the colours were very much different to those exhibited in the dealers tank. The back was a dark grey, the main body a grey-bluish colour with an almost violet sheen. The Dorsal fin, with its long tapered point, was edged with red, and the other fins, a delicate translucent green. This male was also beginning to show the lump which often appears on the head of the mature male cichlid. On the gill plate of both fish, a black blotch was situated at the base.

Soon after the breeding tubes had appeared, the fish started to clean off the slate and the male made repeated rushes at the now spawn-filled female. That night I gave them a meal of tubifex and white worms.

The following morning the female was seen to be hovering over the slate, and closer examination showed that a number of eggs had been deposited all over the slate. The fins of the small female seemed rather tattered and several scales were missing—I suppose that the extent of the damage was increased by the difference in size between the two parents—whereas the male was showing no signs of injury.

I left the eggs in the tank until they hatched, about four days later. On the fifth day, however, when the fry were wriggling about on the slate, I noticed the male was eating several fry, instead of moving them back to the slate. I therefore shifted the fry, at this rather delicate stage, by siphoning them into a small transparent plastic container, which I floated in the top of the tank. I also dropped a half-tablet of infusoria culture (dried) into the container.

The fry were soon swimming about in a compact shoal, and at this stage I introduced quantities of newly hatched Brine Shrimp—*Artemia*. The fry grew at a steady rate, and I soon had to move them into a 24in. × 12in. × 12in. tank. While this transfer was taking place, I sorted out the fry that were stunted and disposed of them in the general direction of the snakehead! I think that this killing is most important, since these youngsters are a waste of time for everyone.

The fry grew on well on a diet of whiteworm, brine shrimps, *tubifex* and shredded meat, and later a small amount of vegetable food. They were sold at about 4cm.

I finally raised about 30 youngsters due to constant culling, but I was given very little for them, because of the lack of demand for these fish. Therefore, anyone in the "fish-game", for profit, should avoid the convict cichlid. But the cichlid keeper, I think this fish makes a worthy addition to any collection—if you are ready to provide a suitable tank, separately, as they ARE bad-tempered towards their tank mates.

Coldwater Fishkeeping

CARE OF THE TANK AND POND

by Arthur Boarder

A TANK for coldwater fishes should run for years without any major cleaning operation. Providing nothing is done to upset the balance it is possible for a tank to remain in a healthy condition for as long as the owner requires it. All that is necessary is a weekly servicing and then the tank water should keep safe for fishes and all the water need never be changed. The weekly task should be carried out without fail, but a day or two over will not usually make much difference. The idea of a weekly servicing is that if it is done on one particular day each week, it is not as likely to be forgotten as if it was done at random.

The first job is to clean the inside of the front glass either with a razor-blade on a holder or with a piece of plastic on a stick. This must be done carefully as if a strip is missed, this will show up very plainly when the lamp is switched on. The ends and back glass should be left to green up and not be cleaned. Nothing spoils the look of a set-up tank in a living room more than to see the wallpaper through the tank. I have found a very good way of preventing this with a newly set-up tank. Get a roll of aluminium foil and cut lengths to fit the outside of the back and ends glass. Be very careful how you handle the foil as if it is creased, this will show up when you fit it. Now run some transparent adhesive round the edges of the glass and carefully press the foil into position. See that the shiniest side is to the glass and then the effect will be to give the appearance of a looking glass at the back and ends. If the inside is then kept clean it will be possible to get reflections so that there seems to be more fish in the tank than there are.

To go back to the weekly servicing. Once the inside of the glass has been cleaned one should prune any water plants which have grown too rampant. One should not have too many stems at the surface or they will shade out the light from the lamp. Nor must plants be allowed to grow too strongly near the front of the tank or it may not be possible to see the fish. Now some of the mulm should be siphoned out and this is best done by using a glass tube, about half an inch in diameter attached to a rubber tube of the same width. This should be long enough to reach the floor quite easily. Now spread some sheets of newspaper on the floor near the tank or you may make a mess, as it is easy to let the rubber tube stray from the pail. To start the siphon all that is necessary is to fill the tube with water and hold the ends up high. Then lower the glass into the water and drop the rubber end into the pail. Another method is to immerse the glass tube in the tank and give a quick suck at the rubber end to start the water running. One can soon get the knack without getting a mouthful of water. Once the siphon is running let the end of the glass tube remain about a third of an inch above the gravel and keep it moving with a slightly circular movement over the front half of the base of the tank. Keep a thumb and finger across the rubber tube so that if a fish gets too near, a sudden pressure will save it from being caught up. The same process should be applied if any water plant gets too near the end of the tube.

There is never any need to remove all the mulm as some must be left for the plants. After some weeks of cleaning it may be found that a little of the sand or gravel has been sucked away. This should be replaced with clean compost. The siphoning will have removed about three gallons of water from a tank about 24 in. × 12 in. × 12 in., and this should be replaced with fresh water. Never try to clean the old water and return it to the tank. The fish will appreciate some fresh water every week. If it is colder than that already in the tank it will not harm the fish, they will soon be swimming about livelier than ever. Now clean the outside of the front glass and all should be in order. I always return fresh water from a water-can with a fine hose. There is no need to use paper or a flat piece of wood at such times and these may only be necessary when the tank is first set up.

Finish off the task by cleaning the front glass. After the weekly cleaning has been carried out, make sure that you do not over-feed with dried foods or you will soon get black mulm forming on the bottom of the tank and round the base of the plants. It is surprising how fish will clean up a tank if no food is given for a couple of weeks. One can find this out after returning

from a fortnight's holiday. A tank which, before going looked anything but clear, can look in show condition on one's return as long as no kindly neighbour has been feeding the fish whilst you are away.

The care of the garden pond is not such a regular task as is necessary for the indoor tank. Very little should go wrong all through the warmer months of the year. It is only when the water cools down that some troubles could occur. This is mainly due to the fact that many pondkeepers will continue to feed as usual, but the fishes have lost their appetites and do not eat the food given. Also, it must be realised that the water plants have mostly died down and so cannot help to use up any waste matter in the pond.

However, there are some tasks which can be performed to help to keep everything going along smoothly. For instance, once the warmer weather arrives and the water gets less cold, it will help the water plants to grow strongly if some of the old water is removed from the pond and fresh run in. There is no need to change a lot, but about a third should be enough. There is no doubt that this fresh water will be appreciated by the fishes and it is a sure thing that if the fishes have not spawned before, they will do so once the water is freshened up. The water plants should be inspected and any which appear to have died should be replaced with fresh ones.

If you find any goldfish in the pond which are at least three inches long and have not yet changed colour, it is advisable to remove them at once. They may be large enough to breed and if they are allowed to do so it is possible that the number of young ones which fail to change will increase year by year. It is not easy to catch individual fishes from a fair sized pond, but if the pond is visited at night it is possible that, with the aid of a strong torch any individual fish could be caught. It is possible to construct a type of cage in which to catch fishes. This is done by using fine plastic netting to make a container with a funnel shaped opening. The funnel runs well into the cage and when fishes enter they cannot find the way out. A piece of white fibrous material hung inside the trap will induce the fish to enter. The cage should be tied to plastic string and anchored to the side so that it can be inspected each morning. No doubt some of the unwanted fishes will be found in the trap, but with a little patience the fish which are the ones to be removed will be caught sometime.

Many pondkeepers will be anxious to increase the number of fishes in the pond and this is when caution is needed. So many ponds function perfectly for a year or more, but when fresh fish are introduced trouble occurs. This is almost sure to be that some pests or diseases have been brought in with the fresh fish. I am sure that it is not easy to isolate every fresh fish but the trouble is well worth while. I found this out about thirty-six years ago when a friend gave me a large tench he had caught. There did not appear to be anything wrong with this fish when I put it in the pond, but it brought in with it a bad infestation of fish lice. I had never seen one on my fish before this, but had quite a job to clear them from the fish in the pond. The trouble with these pests is that they can be tucked close to the body of a fish where the fins meet the body and so are not plainly visible without making a close inspection. However, this experience taught me to be most careful on future occasions.

It is probable that the water in the pond will turn green once the light increases with the longer days and the warmth of the sun. The lack of plenty of growing water plants in the pond will tend to assist the growth of the *algae* which is responsible for the greening of the water. Once the plants grow more strongly it is possible that the water will clear. The changing of most of the water can help a lot, as although the pond water may turn green again after this, it is probable that the water plants will have been encouraged to grow with the fresh water and so they will tend to overpower the *algae*. If some duck weed, *Lemna*, can be obtained, this is a fine plant for shading out much of the light before the water lilies get a chance to cut out much of the sunlight. Some pondkeepers have complained that once they introduce duck weed to the pond it takes over and covers the whole surface of the pond. I have never found this a problem as I can clear my pond in minutes by playing a hose on one side of the pond and rolling all the duck weed to the other side. It can then be pulled out quite easily with a rake. Also of course, one should realise that if there are numbers of healthy goldfish in the pond which have not been over-fed, they will eat much of the duck weed, and a very good food it is for them too.

If fishes are not fed too much they will always browse around the pond and find something. By doing so they are more likely to clear up anything edible which, if uneaten, could start to decay and pollute the water. If some garden worms are available they can be fed as often as possible as they are a grand food and few fishes will not take them avidly. If any fish does not go for a worm as soon as it is offered I would suspect that there is something wrong with it. I always break a worm in two, no matter how large the fishes are in the pond as if a small fish should take a very large worm it is possible to choke with it, that is, if it gets the worm before a larger fish has a chance to do so. A worm can live in the water for two or three days but if there is a tench in the pond it is almost certain that no worm will get a chance to do so. Remember one of the golden rules of fishkeeping, and that is, more fishes are killed by over-feeding than from any other cause, not that they over eat but the food they cannot clear up soon pollutes the water, the fishes go off their food and any more food makes matters much worse and the fish will die.

News from AQUARISTS' SOCIETIES

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

THE **Sandgrounders' A.S.** held their annual general meeting in March, when the following officers and committee were elected: President, D. Murphy; chairman, H. Ormesher; vice-chairman, R. Clift; hon. secretary, S. Hooton, 81 Radnor Drive, Southport, Telephone 84743; hon. treasurer, K. Howard; show secretary, S. Hughes, Flat 6, 73 Promenade, Southport; junior secretary, Master B. Sumner; auditor, R. Clift; committee, E. Sutcliffe, R. Norris, T. Tasker, M. Mullen.

The Sandgrounders hold their meetings on alternate Thursdays at the Temperance Institute, London Street, Southport, at 8 p.m., and looks forward to giving its members the best there is to offer for the next year. Both beginners and experts are welcome to attend any of the meetings.

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MEMBERS of **Chelmsford A.S.** heard a talk on Cichlids and Killifish by Mr. Corby of Dagenham at their March meeting. Mr. Corby also judged the table show. Winners of the Cichlid class were: 1, D. Bannerman; 2, L. Fountain; 3, K. Turner; 4, J. Newiss. Winners in the Dwarf Cichlids class were: 1, D. Bird; 2, 3 and 4, N. Murfitt.

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THE April meeting of the **British Marine Aquarists Association**, West Midland Group began with a slide show by the association chairman, D. Highfield, on Native Marines that had been in tanks for a long time and were in as good condition as when he first had them. Members T. Wilkinson and F. Wilkinson came down from Warrington, J. Foen from Melton Mowbray and G. Robertson from Scotland.

The group will now make up a stand that will hold two 36 in. × 15 in. × 15 in. all-glass tanks, one being for Native Marines and the other for Tropical Marines.

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AT the annual general meeting of **Hartlepool A.S.** the following committee members were elected: Chairman, E. Williams; treasurer: P. Redman; secretary, Mrs. R. Newton; show secretary, J. Watson; librarian, P. Newton; F.B.A.S. representative, R. Atherton. The starting of a library was discussed and members agreed to donate books to the scheme. The next meeting is on the 7th May in the "Travellers Rest" Hotel, and starts at 8 p.m. New members welcome.

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THE **Fancy Guppy Association**, Birmingham Section, points cup trophy comprises twelve monthly table shows. Results of the first table show were as follows: 1, W. Ewart (Radford); 2, Vowles and Vinall (S. London); 3, M. Delingpole (Alvechurch); 4, G. Fletcher (Pelsall); 5, (equal), R. Francis (Aberdare) and A. C. and L. Trumen; 7, Mrs. Croft (Wimbourne); 8 (joint), R. Jones (Birmingham); T. Smith (Birmingham); D. Steadman (Kingswinford), G. Steadman (Kingswinford). At this meeting the major honours went to M. Delingpole with best male, best opposite sex and best breeder to G. Steadman, best in show to T. Smith for a team of breeders pairs. It is always most pleasing when one of the newer club members wins a card award. This month R. Francis, who travelled from South Wales to be present at the above table show, took third place in the Delta class. This class is considered by many experts to be a most difficult section for the beginner to succeed in. On Sunday, 27th May, most of the leading guppy breeders meet at Stechford, Birmingham, to compete in the F.G.A. World International. A warm welcome is extended after 3 p.m. to all those enthusiasts who are interested in good standard-shaped guppies and their beautiful colours. The association meets on the fourth Sunday afternoon of each month at Glebe Farm Community Centre, Stechford, Birmingham.

Speaker at the February meeting of the Manchester section, F.G.A., was Ian Wood of Bury, present secretary of the F.N.A.S. His talk about Killies was very well received and showed that quite a few members also kept or have kept Killies. There were seventy entries on the show bench. Best exhibit and best female went to D. Glen's Natural Tail Female. J. Hutchings from the Lancaster section took best Male and best Breeders with his double Swords. There was a discussion at the March meeting on foods and feeding from the Manchester section management. F. Campbell who gave a demonstration of how to make dry food. On the table show, best exhibit and best male went to A. Charlton (Top Sword). Best female to P. Young with a Natural Tail Female and best breeders to J. Hutchings' team of Double Swords.

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MORE than thirty members were present at the March meeting of the **Accrington and District A.S.** and they heard a taped recording on several aspects of fish keeping. This was later followed by a table show, the results of which were as follow: Cichlids: 1 (Best in Show), J. Boothman; 2, M. Wild; 3, P. Whelan. Junior: 1, D. Johnson. Liverbearer: 1 and 3, P. Whelan; 2, T. Hallett. Pairs: 1, J. Hallett.

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THE **Riverside A.S.** held their Annual Open Show recently, when 654 fish were entered. Results as follow: Barbs: 1, S. Mason (Rochampton); 2, B. Bissoon (Basingstoke); 3, R. Sellars (Ealing); 4, T. King (Rochampton). Characins: 1, P. Elson (Freelance); 2, J. Pollard (Kingston); 3, J. Jackson (Basingstoke); 4, B. Bissoon (Basingstoke). Cichlids: 1, J. Bates (Ealing); 2, D. Howe (Anson); 3, J. Hughes (Rochampton); 4, T. King (Rochampton). Angels: 1, J. Bates (Ealing); 2, P. O'Bryan (Thurrock); 3, M. Nethersell (Riverside); 4, T. King (Ind.). Dwarf Cichlids: 1, M. Chapman (Basingstoke); 2, K. Purbrick (Hendon); 3, J. Bayly (Sudbury); 4, L. Brazier (Sudbury). Labyrinths: 1, C. Sawford (Rochampton); 2, Mr. MacKay (Kingston); 3, G. Elson (Freelance); 4, J. Hughes (Rochampton). Fighters: 1 and 3, A. Taylor (Sudbury); 2, L. Brazier (Sudbury); 4, Mr. Wall (Thurrock). Egglaying Toothcarps: 1, J. Jackson (Basingstoke); 2, M. Walker (B.K.A.); 3, J. Bates (Ealing); 4, T. King (Rochampton). Catfish: 1, P. Lambourne (Rochampton; 2, D. Lambourne (Rochampton); 3, D. Howe (Anson); 4, M. Nethersell (Riverside). Corydoras and Brochis: 1, J. Bates (Ealing); 2, T. Adams (Hastings); 3, L. Brazier (Sudbury); 4, W. Sutton (Freelance). Rasboras: 1, S. Mason (Rochampton); 2, K. Eldridge (Sudbury); 3, R. Pook (Hounslow); 4, Mr. Mackay (Kingston). Danios W.C.M.M.: 1 and 3, P. O'Bryan (Thurrock; 2, R. Pook (Hounslow); 4, J. Packman (Hendon). Loaches: 1, A. Lusby (Mid-Herts.); 2, T. Cruickshank (Ealing); 3, W. Sutton (Freelance); 4, J. London (Thurrock). A.O.V. Tropical Egglayers: 1, R. Lefevere (Kingston); 2, T. Hewitt (Lewisham); 3, D. Lambourne (Rochampton); 4, T. Lecuirot (Rochampton). B.M. Egglayers, Pairs: 1, P. Lambourne (Rochampton); 2, B. Burton (Freelance); 3, L. Brazier (Sudbury); 4, Mr. Wright (Thurrock). O.T. Livebearers, Pairs: 1, A. Lusby (Mid.-Herts.); 2, L. Brazier (Sudbury); 3, A. Heath (Lewisham); 4, M. Strange (Basingstoke). M. Guppys: 1, K. Usher (Sudbury); 2 and 3, R. Rogers (Sudbury); 4, L. Brazier (Sudbury). F. Guppys: 1, K. Lewis (Rochampton); 2, R. Howel (Anson); 3, A. Heels (Bishop Cleeves); 4, T. King (Ind.). Swordtails: 1, T. Cruickshank (Ealing); 2, J. London (Thurrock; 3, M. Strange (Basingstoke); 4, B. Bissoon (Basingstoke). Platys: 1, G. Elson (Freelance); 2, U. Green (S.A.P.A.); 3, P. O'Bryan (Thurrock; 4, P. Elson (Freelance). Mollys: 1, J. London (Thurrock); 2, A. Heath (Lewisham); 3, R. Howe (Anson); 4, B. Robinson (Lewisham). A.O.V. Livebearers: 1, A. Heath (Lewisham); 2 and 3, R. Newman (Uxbridge); 4, E. Fantham (Sudbury). B.M. Egglayers, Breeders: 1, V. Green (S.A.P.A.); 2, T. Adams (Hastings); 3, D. King (Rochampton); 4, R. Pook (Hounslow. O.T. Livebearers, Breeders: 1, V. Green (S.A.P.A.); 2, B. Bissoon (Basingstoke); 3, A. Powell (Riverside); 4, R. Newman (Uxbridge). Plants: 1, S. Miller (Roehampton); 2, P. O'Bryan (Thurrock); 3, J. Nethersell (Riverside); 4, M. Goss (Riverside). Best Fish of the Show went to J. Bates (Ealing).

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MEMBERS and guests of the **Walthamstow and District A.S.** enjoyed an enlightening and colourful talk by Mr. David Marlborough on "Native Freshwater Fishes' and aquaria at the April meeting. A social evening is scheduled for 16th May, when members from other societies and guests will be welcomed. Meetings are held at the Grange Community Centre, Frederik Street, Walthamstow, E.17, on the first Friday and third Wednesday of every month and visitors and new members are always welcome. For details please contact Mr. A. Chandler, 233 Forest Road, Leytonstone, E.11. Walthamstow and District A.S. Annual Open Show, 11th November. Details to follow.

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RESULTS of the **Thurrock A.S.** annual open show were as follow: Class Ak: 1, B. Cowell; 2, K. Appleyard. Class B: 1, J. Bellingham; 2, C. Wood; 3, S. Mason; 4, J. London. Class C: 1, P. Elson; 2, B. Wright; 3, K. Graves; 4, J. Boss. Class Dz: 1, C. Cruz; 2, C. Elliot; 3, J. Bellingham; 4,Mr. and Mrs. Hubert. Class Da: 1, J. Hughes; 2, P. Cottle; 3, J. London; 4, A. Turner. Class Db: 1 and 4, P. Moye; 2, R. Bowes; 3, M. J. Wall. Class Ez: 1, S. Cowell; 2, S. Jordan; 3, C. Goddard; 4, J. Hughes and S. Cowell. Class Ea: 1, T. Woolley; 2, T. Taylor; 3, D. Durrant; 4, B. Wall. Class F: 1, H. Juson; 2, R. Thoday; 3, B. Wright; 4, L. Baker. Class G: 1, J. Fordham; 2, R. Bowes; 3 and 4, B. Wright. Class H: 1, B. Scales; 2, S. Mason; 3, W. Sutton; 4, A. Tuffin. Class J: 1, S. Mason; 2, A. Williams; 3, P. O'Brien; 4, A. Tuffin. Class K: 1, J. Bellingham; 2, J. Boss; 3, C. Elliott; 4, P. O'Brien. Class L: 1, F. Gardner; 2, R. Bowes; 3, W. Sutton; 4, D. Livermore and D. Keen. Class M: 1 and 2: S. Hedges; 3, J. Fordham; 4, A. Cowell (Jnr.). Class N(b-m): 1, C. Wood; 2 and 4, R. Argent; 3, J. Bellingham. Class N(o-t): 1, A. Heath; 2, J. London; 3, K. Appleyard; 4, B. Robinson. Class O: 1, R. Bowes; 2, Mr. and Mrs. Baker; 3, M. Seago; 4, C. Goddard. Class P: 1, T. A. King; 2, D. Durrant; 3, J. Twine; 4,

A. Tuffin. Class Q: 1 and 4: J. Furber; 2, J. London; 3, P. O'Brien. Class R: 1, M. Smith; 2, T. King; 3, P. Cottle; 4, P. Moye. Class S: 1, W. Rowe; 2, S. Mason; 3, A. Tuffin; 4, J. London. Class T: 1 and 3, T. Twine; 2. A. Chandler; 4, R. Wall. Class U: 1, S. Hedges; 2, H. Junon; 3, K. Adams; 4, D. Goodbody. Class V: 1, J. London. Class W: 1, S. Hedges; 2, C. Thomas; 3 and 4, D. Goodbody. Class X(b-m): 1, J. Boss; 2, D. Murdie; 3, M. Pearson; 4, M. Pearson and P. Cottle. Class X(o-t): 1, Mr. and Mrs. Baulsom; 2, P. Cottle; 3, J. A. King; 4, T. Woolley. Class Z: D. Durrant; 2, J. Hughes; 3, J. Marshal; 4, P. O'Brien. Best Fish in Show: S. Hedges.

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IN March, **Southend, Leigh and D.A.S.** were hosts to East London, Thurrock and North Kent A.S. for the first round of the 1973 Inter-club series. The table shows results at the end of round were: Thurrock 27pts; Southend 14pts; North Kent 6pts; East London 3pts. Best fish in show was a Corydoras belonging to P. O'Brian of Thurrock A.S.

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THE **Border A.S.** have had several meetings over the past few weeks, including a demonstration on the construction of an all glass tank and the setting up of a community tank. This was mainly for the benefit of the new members. The society has also had a quiz and a film show.

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AT the February meeting of **Knowle and District A.S.** the results of the furnished aquaria competition were given, and slides of all the tanks judged were shown to the members and a very useful discussion took place. Results: Open Class: 1, N. Gray; 2, K. Gray; 3, C. Webb Novice Class: 1, K. Gray; 2, C. Webb; 3, D. Godfrey. There was also a table shown for H. and H. and the results were: Open Class: 1 and 2, M. Martin; 3, N. Gray. Novice Class: 1, M. Martin; 2, P. White; 3, K. Gray. C. B. Thomas attended the March meeting and gave a very interesting talk on coldwater fish. The table show was for coldwater fish and the results were: Open Class: 1, 2 and 3, W. Ham. Novice Class: 1, 2 and 3, M. Martin.

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RECENTLY, members and friends of the **Bristol Tropical Fish Club** attended a lecture given by B. Gorwell, his topic being Corydoras Catfish. Also held was the first of this years club table shows, this months class being Catfish and Loaches, the winners being N. Gray, Open, and K. Gray, Novice. The schedules are now available for the June show from T. A. Coggins, 36, Leighton Road, Southville, Bristol.

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THE monthly meeting of **Newbury and D.A.S.** was the occasion for a twelve-a-side A.V. plus breeders team match with Reading A.S. which resulted in a win for the home society by fifteen points to 10. Results were: 1, C. Dixon (Newbury) 80 pts.; 2, D. Eaton (Reading) 79½ pts.; 3, P. Legg (Newbury) 78 pts.; Joint 4th, A. Green (Reading) 78 pts. and J. Lloyds (Newbury) 78 pts. Breeders team: C. Dixon (Newbury) 78 pts.; A. Green (Reading) 77 pts. Judge F.B.A.S. Class A. Maurice Carter.

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TWO meetings of the **Welwyn Garden City A.S.** were held in March. At the first, Peter Bird gave a first class illustrated talk on Killifish and numerous members took up the challenge of keeping and breeding these fish when the speaker gave away a quantity of eggs. The table shows were won by A. Margrove and G. Tipping. At the second meeting a large gathering listened to a superb talk by John Harvey of Fins and Wings. His talk was directed at the fundamentals of Tropical Marines. He discussed the advantages of having kept fish before venturing into the Marine field, but warned of some basic points which would not apply to keeping Marines. An attempt to increase the interest in the coldwater species would be made, and it was hoped for more support from non-members in the area to expand this side of the hobby. New members would be made very welcome at any club meetings held on the first and third Mondays of each month at the Scout Hut, Great Dell, W.G.C., starting at 8 p.m. Phone B. Stephens, W.G.C. 27673.

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RESULTS of **Nelson A.S.** open show held in March were as follow: Best in show: Mr. and Mrs. Norris, with a Japanese Weather Loach. Guppies: 1, C. Berry (Valley); 2 and 3, L. Leadbetter (Fleetwood). Swordtails: 1, C. Beckenham (Oldham); 2, A. Kaye (Top Ten); 3, L. Leadbetter (Fleetwood). Mollies: 1, C. Beckenham (Oldham); 2, L. Leadbetter (Fleetwood); 3, A. Gregory (Nelson). Platies: 1, G. Mibbetson (Keighley); 2, B. Kaye (Top Ten); 3, L. Leadbetter (Fleetwood). A.O.V. Livebearer: 1, L. Leadbetter (Fleetwood); 2, Clark Bros (North Staffs.); 3, G. Kershaw (Heywood). Small Characins: 1 and 2, P. Bowden (Stretford); 3, A. Gregory (Nelson). Large Characins: 1 and 2, B and B. Booker (Morecambe); 3, K. Ankers (North Staffs.). Angels: 1, L. Leadbetter (Fleetwood); 2 and 3, H. R. Sephton (Grimwood). Dwarf Cichlids: 1, J. A. Whiteley (Aireborough); 2, L. Leadbetter (Fleetwood); 3, B. Kaye (Top-Ten). Large Cichlids: 1, D. Grogan (Morecambe); 2, R. Atherton (Grimwood); 3, L. Leadbetter (Fleetwood). Corydoras and Brochis: 1, P. and H. Batchelor (Loyne); 2, Mrs. C. Atherton (Grimwood); 3, K. Ankers (North Staffs). A.O.V. Catfish: 1, A. Mifflin (North Staffs.); 2, G. Holt (Valley); 3, D. Greenwood (Nelson). Loaches: 1, Mr. and Mrs. Norris (East Lancs.); 2, F. E. Gregory (Oldham); 3, H. Marshallsea (Oldham). Rasboras: 1, R. I. Payne (Merseyside); 2, L. Leadbetter (Fleetwood); 3, B. and B. Booker (Morecombe). Sharks and Foxes: R. I. Payne (Merseyside); 2, F. Mulla (Merseyside); 3, J. A. Whiteley (Aireborough). Danios and Minnows: 1, Clark Bros. (North Staffs.); 2, D. Moylan (Blakeborough); 3, A. Kaye (Top-Ten). Tooth Carps (Pairs): 1 and 2, J. Roberts (Nelson); 3, L. Chant (Valley). Tooth Carps: 1, K. Ankers (North Staffs.); 2 and 3, J. Roberts (Nelson). Small Barbs: 1 and 2, F. E. Gregory (Oldham); 3, B. Black (Fleetwood). Large Barbs: 1, C. Beckenham (Oldham); 2, Miss J. Quinnon (Valley); 3, A. Baldwin (Nelson). Fighters: 1, Miss K. Chapman (Valley); 2, T. Davies (Heywood); 3, Master S. Quinton (Valley). Small Anabantids: 1, Mr. and Mrs. F. Buxton (Aireborough); 2, Clark Bros. (North Staffs.); 3, R. I. Payne (Merseyside). Large Anabantids: 1, A. Gregory (Nelson); 2 and 3, R. I. Payne (Merseyside). A.O.V: 1, R. Francis (Loyne); 2, D. Grogan (Morecombe); 3, A. Mifflin (North Staffs.). Pairs (Livebearers): 1, L. Leadbetter (Fleetwood); 2, F. Mulla (Merseyside); 3, G. Kaye (Top-Ten). Pairs (Egglayers): 1, F. E. Gregory (Oldham); 2, Mr and Mrs. Smith (Osram); 3, S. Seymour (Merseyside). Breeders (Livebearers): 1, L. Leadbetter (Fleetwood); 2 and 3, G. Hibbetson (Keighley). Breeders (Egglayers): 1 and 2, Mr. and Mrs. F. Buxton (Aireborough); 3, P. Bowden (Stretford). Fancy Goldfish: 1, S. Walsh (Accrington); 2 and 3, C. Whitsey (Accrington). Common Goldfish: 1 and 2, C. Whitsey (Accrington); 3, S. Walsh (Accrington). A.O.V. Coldwater: 1, Clark Bros. (North Staffs); 2, K. Ankers (North Staffs.); 3, R. Atherton (Grimwood). Juniors (Livebearers): 1, Miss L. Molyneux (Grimwood); 2, D. Johnson (Accrington); 3, Miss Greenwood (Independent). Juniors (Egglayers): 1, D. Greenwood (Nelson); 2, Master A. Mifflin (North Staffs.); 3, Master A. Wild (Accrington).

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ELECTION of officers at the annual general meeting of the **West Gloucestershire A.S.** resulted as follows: Chairman: J. McMillan; vice-chairman, R. Randall; vice-chairman, J. Holmes; secretary, Mrs. M. Hook, 3 Woodland Road, Drybrook, Gloucester; assistant secretary, Mrs. W. McMillan; treasurer, P. Hook; publicity officer, F. Jones; catering officer, Mrs. I. Reed. Meetings in future will be held on the first Monday in the month at the Town Hall, Mitcheldean headquarters. The Society is pleased to announce that after the third attempt in the six-a-side competition they have won first place.

THE **Thorne A.S.** have changed their show date from the 1st July to the 2nd September. The meeting place is also transferred to the Green Top School, Thorne. Meetings every Thursday at 7.30 p.m. Alterations to Society officers: Chairman, M. Curtis; treasurer, H. Candow.

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THERE was an entry of 383 at **Houghton and District A.S.** open show in April. The winning society was Peterlee who received the Blue Riband Trophy for the second time in succession. The Best Fish in the Show was a Red-finned Shark, owned by R. Greenly of the Half Moon A.S. The winner of the President's Trophy was H. Hubbard of Peterlee A.S. Full results were as follow: Furnished Jars: 1 and 2, J. Robertson (Mt. Pleasant); 3, E. Snaith (Mt. Pleasant). Large Barbs: 1, Mr. and Mrs. Wells (Doncaster); 2, Mr. Stevenson (Stanley); 3, A. Barker (Cleveland). Small Barbs: 1, H. Hubbard (Peterlee); 2, R. Alexandra (Washington); 3, Mr. and Mrs. Birdsop (Aireborough). Large Characins: 1, R. Caygell (Half Moon); 2, Mr. Duncanson (Priory); 3, Mr. and Mrs. Liddell (Ashington). Small Characins: 1, Mr. and Mrs. Milne (Doncaster); 2, A. Richardson (Houghton); 3, R. Nesworthy (Peterlee). Large Cichlids: 1, L. Collins (Stockton); 2, B. Cooper (Peterlee); 3, Mr. and Mrs. Furness (Castleford). Small Cichlids: 1, R. Caygell (Half Moon); 2, J. Watson (Hartlepool); 3, J. Furness (Castleford). Haplochromis Derivatives: 1, C. A. Enright (Houghton); 2 and 3, H. Hubbard (Peterlee). Labyrinths: 1, Mr. and Mrs. Milne (Doncaster); 2, Mr. Staniland (Hartlepool); 3, R. Tompson (Bishop Auckland). Betta Splendens: 1, Mr. and Mrs. Milne (Doncaster); 2, J. Hellens (Houghton); 3, F. Coleman (Whitley Bay). B. L.T. C.: 1 and 2, J. Robertson (Mt. Pleasant); 3, M. Ruffell (B.K.A.). Catfish and Loach: 1, J. Gellespie (Castleford); 2, Mr. and Mrs. Milne (Doncaster); 3, Mr. Saunders (Stockton). Corydoras and Brochis: 1, Mr. Staines (Ashington); 2, Mr. and Mrs. Wells (Doncaster); 3, Mr. and Mrs. Liddle (Ashington). Rasbora, Danio and White Cloud Mountain Minnows: 1, Mr. and Mrs. Wells (Doncaster); 2, Mr. Smith (Peterlee); 3, W. Hall (Washington). Sharks and Flying Fox: 1, K. Greenly (Half Moon); 2, R. Snaith (Ind.); 3, M. Smith (Peterlee). A.O.V.: 1, Mr. Smith (Peterlee); 2, P. Newton (Hartlepool); 3, Mr. and Mrs. Liddle (Ashington). Egglaying (Pairs): 1, E. Williams (Hartlepool); 2, Mr. and Mrs. Sowerby (Mt. Pleasant); 3, M. Turnbull (Hetton). Livebearing (Pairs): 1 and 2, Mr. and Mrs. McGee (Half Moon); 3, R. Crombie (Peterlee). Guppies: 1, L. Collins (Stockton); 2, R. Nesworthy (Peterlee); 3, R. Alexandra (Washington). Swordtails: 1, D. Smith (Ashington); 2, Mr. and Mrs. Furness (Castleford); 3, R. Elliot (Stanley). Platties: 1, D. Smith (Ashington); 2 and 3, H. Hubbard (Peterlee). Mollies: 1, R. Nesworthy (Peterlee); 2, G. Brown (Mt. Pleasant); 3, H. Hubbard (Peterlee). Coldwater: 1, Mr. and Mrs. Davison (Ashington); 2, N. Bell (Blyth); 3, Mr. and Mrs. Furness (Castleford). Breeders (4 fish) and Egglayers: 1, H. Hubbard (Peterlee); 2, J. Watson (Hartlepool); 3, J. Laycock (Half Moon). Breeders (Livebearers): 1, R. Caygell (Half Moon); 2, R. Nesworthy (Peterlee); 3, H. Hubbard (Peterlee). Best Fish in the Show: R. Greenly (Half Moon).

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THE Results of the Inter-Society Table Show and Quiz between **Chester A.S., Runcorn A.S. and Northwich A.S.** were as follow: 1, Northwich 48 pts; 2, Chester 18 pts.; 3, Runcorn 13 pts. The table show was judged by Mr. K. Parkes and Mr. F. Mulla of Mersey-

side A.S. The quiz organised by Mr. L. Bradley was won by Northwich, Chester being second and Runcorn third.

Table show results: Guppies: 1, R. Knowles (N.); 2, S. Bridson-Jones (N.); 3, P. Hall (R.). Mollies: 1, D. Walker (R.); 2, B. Newport (R.); 3, S. Yates (N.). Small Characins: 1, B. Newport (R.); 2, R. Knowles (N.); 3, D. and L. Thorne (N.). Large Characins: 1, C. Bowyer (C.); 2, J. Hall (R.); 3, S. Yates (N.). Cichlids: 1, L. and D. Thorne (N.); 2, R. Dutton (C.); 3, P. Floyd (N.). Angels: 1, R. Antonio (N.); 2, L. Bradley (N.). Flying Foxes, Loaches, Botias: 1, D. Walker (R.); 2, D. and L. Thorne (N.); 3, J. Hall (R.). Fighters: 1, L. and D. Thorne (N.); 2, J. Hall (R.); 3, R. Dutton (C.). Anabantids: 1, R. Dutton (C.); 2, C. Bowyer (C.); 3, P. Wrench (N.). Breeders (Egglayers): 1, L. and D. Thorne (N.); 2, B. Ralph (C.); 3, P. Floyd (N.). Breeders (Livebearers): 1, R. Knowles (N.); 2, D. & L. Thorne (N.); 3, R. Knowles (N.). Coldwater: 1, L. and D. Thorne (N.); 2, H. Buckley (N.); 3, J. Hall (R.). Furnished Min-Jar: 1, L. and D. Thorne (N.); 2, L. Bradley (N.). Best Fish in Show: D. and L. Thorne.

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THERE were three meetings of the **Seven Side Ichthyological Society** in March. The first meeting of the month was a night of films, the first of which was an 8mm. colour movie made by Mr. G. Ralphs, a society member. The film showed Mr. Ralphs' own aquarium with some close-ups of some of his many fish. There was then a slide show on marine fish which was narrated by Mr. M. Pinches, the society secretary. He gave some hints on keeping these beautiful fish. At the next meeting Mr. Pinches again gave some hints and tips, this time on heating in the aquarium. This was followed by a cross-word quiz by Mr. M. Price. At the last meeting of the month members enjoyed a fine tape and slide show by C. Price, of Wrexham A.S. It was split into three parts, the first on shows, the second on killifish and the third on marine fish. It made an interesting evening and the society would like to thank Mr. Price for coming along. Meetings of the society are held fornightly at the Labour Club, Abbeyforegate, Shrewsbury all are welcome.

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IN March the **Brentwood A.S.** was pleased to welcome back one of their founder members in the person of Bernard Pye, who gave one of his most interesting lectures on plants. As usual he was an informative and helpful speaker.

At the second March meeting, another return visit this time from Mr. Tisbury, of Spice Pitts Farm. He gave a lecture on Coldwater Fish which proved to be very interesting, containing many facts about the history of coldwater fish.

There is also room for a few more members. For further information please phone Upminster 27555.

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AT the **Thurrock A.S.** last meeting a slide show on Characins was given by Chairman E. Nicol and J. Hatton. Table show winners were: Class D: 1 and 3, P. Dale; 2, R. Wall. Class Db: 1 and 3, M. Wall; 2, H. Juson. 14 entries.

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ONE of Yorkshire's oldest clubs, the **Bradford & District A.S.** elected the following officers at their annual general meeting. President: W. Holmes; Treasurer: E. J. Brown; Secretary: John Cawthra, 74 Hastings Avenue, Bradford BD5 9PP. Meetings are still held on the first Wednesday of each month at Unity Hall, Rawson Square, Bradford. Meetings commence at 7.45 p.m. and newcomers are welcome to attend without being asked to join.

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THE March monthly meeting of **S.P.A.S.S.** took the form of very interesting and informative lecture on preparing Goldfish for the breeding season. This was given by Mr. Roger Whittington, of the G.S.G.B., who has extensive knowledge on this subject. The table show for this month was for Native and Foreign class and was very ably judged by I. Pollard, of K.D.A.S. Winners: 1 and 2, Mrs. M. Dudley; 3 and 4, G. Herring. The meeting for May will include a talk to be given by R. Dodkins on the subject of Filtration, and the table show will be for Twintails on Tuesday, 15th May.

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THE evening meeting of the **British Marine Aquarists Association, West-Midland Group** began with a slide show on Marine Life. The table show result was: 1, J. Vickery; 2, A. Mawbly; 3, G. Wardle. It was decided to have a film show open to all clubs at a date in July, and it will be The Great Barrier Reef, which lasts for three hours, and is in sound and colour. More details will be given later. Details are on the way for an outing with a diving club to get more native marines. The West-Midland Group welcome all who are interested in Marine Life at their monthly meeting on the first Tuesday of each month at the Midland Vaults, High Bullem, Wednesbury.

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DETAILS and results of **Gainsborough A.S.** first open show were as follow: There were 593 entries from 18 Societies. Guppies: 1, Mr. Wallis (Scunthorpe); 2, M. J. Rhodes (Four Star); 3, A. Thorpe (Gainsborough). Swordtails: 1, D. Laycock (Sheffield); 2, B. Asquith (Castleford); 3, Miss S. Clarke (Aireborough). Mollies: 1, Mr. and Mrs. King (Doncaster); 2, R. David (Gainsborough); 3, R. Varney (Gainsborough). Platies: 1, Mr. and Mrs. Blades (Creswell); 2, N. Llett (Stockton-on-Tees); 3, T. Smith (Sheffield). Section winner: Mr. and Mrs. Blades (Creswell). Barbs (Small): 1, M. Duddy (Rossington); 2, Mrs. P. Baker (Castleford); 3, Mr. and Mrs. Wells (Doncaster). Large Barbs: 1, M. Jackson (Grimsby); 2, J. Rhodes (Four Star); 3, N. Taylor, Gainsborough. Section winner: M. Jackson (Grimsby). Characins (Small): 1, D. Laycock (Sheffield); 2, M. Polfard (Grimsby); 3, Mr. Pattison (Grantham). Large Characins: J. A. Whitely (Aireborough); 2, Mr. Stokes (Lincoln); 3, Mr. Harlow (Derby Regent). Section winner: D. Laycock (Sheffield). Breeders (Livebearers): 1, Master N. Cowan (Gainsborough); 2, Mr. and Mrs. Blades (Creswell); 3, K. Allen (Independent). Egglayers: 1, Mr. and Mrs. R. Middleton (Gainsborough); 2, B. Banks (Thorne); 3, Mr. Perkins (Worksop). Section winner: R. Middleton (Gainsborough). Shark and Foxes: 1, J. Whitley (Aireborough); 2, P. Robinson (Four Star); 3 G. Thickbroom (Castleford). Corydoras: 1, Mr. and Mrs. Clarke (Aireborough); 2, Mrs. P. Baker (Castleford); 3, T. Smith (Sheffield). Botias and Loaches: 1, Mr. and Mrs. Kilvington (Doncaster); 2, Mr. Hancock (Hull); 3, Mr. and Mrs Clarke (Aireborough). A.O.V. Catfish: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. V. Hardy (Scunthorpe); 3, Master J. Baker (Castleford). Section winner: Mr. and Mrs. Copley (Doncaster). Marine Tropical: 1, Mr. and Mrs. Caldow (Scunthorpe); 2 and 3, Mr. Sutcliffe (B.M.A.A.). A.O.V. Tropicals: 1, G. Thickbroom (Castleford); 2, P. Stainforth (Don Valley); 3, D. Caldow (Scunthorpe). Section winner: Mr. and Mrs. D. Caldow (Scunthorpe). Anabantids (Lighters): 1 and 2, D. Laycock (Sheffield); 3, Mr. Kirkeson (Grimsby). Small Anabantids: 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. Buxton (Aireborough); 3, Mr. and Mrs. Norton (Grimsby). Large Anabantids: 1, Mr. and Mrs. Blades (Creswell); 2, S. Withers (Gainsborough); 3, Mrs. Robinson (Gainsborough). Section winner and Best fish in show and Aquarist Gold Pin went to Mr. and Mrs. Cohen (Pontefract). Cichlids (Dwarf): 1, Mrs. P. Baker (Castleford); 2, Mr. and Mrs. Sellers (Lincoln); 3, J. A. Whitley (Aireborough). Angels: 1, Mr. and Mrs. Kirk (Grimsby); 2, Mr. Kiehn (Lincoln); 3, Mr. and Mrs. Binns (Scunthorpe). A.O.V. Cichlids: 1, Mr. and Mrs. Gilding (Gainsborough); 2, Mr. Reed (Worksop); 3, Mr. Stokes (Lincoln). Section winner: Mr. and Mrs. Kirk (Grimsby). Pairs (Livebearers): 1, G. Thickbroom (Castleford); 2, J. A. Whitley (Aireborough); 3, J. Furness (Castleford). Egglayers: Mr. and Mrs. Blades (Creswell); 2, Mrs. Rawdin (Lincoln); 3, Mr. and Mrs. Shipman (Grantham). Section winner: G. Thickbroom (Castleford). Juniors (Livebearers): 1, Paul Pattison (Lincoln); 2, Miss S. Clarke (Aireborough); 3, Master Edwards (Castleford). Egglayers: 1, G. Allen (Independent); 2, Miss S. Clarke (Aireborough); 3, Master Holmes (Castleford). Section winner: G. Allen (Independent). Coldwater Goldfish and Comets: 1, 2 and 3, J. S. Hall (Aireborough). Shubunkins and Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). A.O.V. Coldwater: 1, J. S. Hall (Aireborough); 2 and 3, Mr. Bennett (Gainsborough). Section winner: J. S. Hall (Aireborough). Toothcarp Killies: 1, H. Kiehn (Lincoln); 2, T. Smith (Sheffield); 3, J. Whitley (Aireborough). Minnows and Danios: 1, T. Smith (Sheffield); 2, Mr. Pattison (Grantham); 3, J. Whitley (Aireborough). Rasboras: 1, G. Gillespie (Castleford); 2, Mr. and Mrs. Gilding (Gainsborough); 3, Mr. and Mrs. Wells (Doncaster). Section winner: T. Smith (Sheffield). Judges: G. Gibson, A. Deakin, Mr. Colston, J. Fletcher, Mr. Blagard and Mr. Horsforth.

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THE March meeting of the **Keighley A.S.** was addressed by P. Moorhouse of Huddersfield who spoke on Keeping Marine Fish, and showed films of various Marine Fish spawning. The monthly table show results were as follow: Fish of the Month (Cichlids): 1, L. Jackson; 2, B. Lydon; 3, J. Ibbotson. A.O.V.: 1, J. Bottomley; 2, J. Ibbotson; 3, R. Sagar. Novice A.O.V.: 1, J. Ibbotson; 2, B. Lydon; 3, L. Jackson. Junior A.V.: 1, Master A. Hollinsworth; 2 and 3, Master J. Bardgett.

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THE annual general meeting of the **Borough A.S.** was held in February when the officers elected were: Chairman: P. Loughran; Secretary: E. Callaghan; Treasurer: D. Mayberry; Asst.-Secretary: Miss Joan Moran. There was also a successful raffle. In March there was a quiz slide show when members had to identify the slides fish and the winner received a medal. New members are always welcome, and the society meet at The Carney Arms Hotel, the second Wednesday of every month, at 8.00 p.m.

Secretary changes: Mr. Eric Callaghan, 4 South Hill Park, Booterstown Avenue, Blackrock, Co. Dublin. Phone 880406.

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MANY members competed in the **Exmouth and District A.S.** second table show at the last meeting. The results were as follow: Catfish and Loaches: 1, Mrs. Stevens (also Best in Show); 2, B. Carde; 3, D. Pannell. Cichlids: 1, D. Pannell; 2, J. Penna. Rasbora, Characins and Danios: 1, Mrs. Stevens; 2, J. Hawkins; 3, B. Carde. Coldwater: 1, J. Hawkins; 2, J. Penna. Livebearers: 1 and 2, B. Stevens. Juniors: 1, Master S. Brown; 2, Master H. Carde; 3, Master T. Dentith.

The Society has been going for nearly nine months now, and has a membership of 29. Also they are having the first open show, on Saturday, July 28th, at the Church Hall, corner of Rolle Street and Chapel Street. The F.B.A.S. have awarded us the Uxbridge Molly Cup, (Perpetual).

Details of the Society, and the show, are available from P. J. Ashton, at Dunsinane, Maer Road, Exmouth. Show schedules will be available in the near future, when judges names are available. Meetings are now held on the second Friday and fourth Monday in each month, at the Sailors Rest, St. Andrew's Road, and the Leisure Centre, Imperial Road, respectively.

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THE last three meetings of the **Hemel Hempstead A.S.** have consisted of a lecture about anaesthetizing fish, given by one of the club members, Alan Tuffs, the showing of Jacques

Cousteau's film, World Without Sun, and an auction of stock to club members.

Information about the Society can be obtained from Jan Collins, Hemel Hempstead 4449.

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THE fifth annual open show of the **Keighley A.S.** created a new record with 833 entries. Best in Show: Mr. Thickbroom, of Castleford, winning Best in Show Trophy, A.Y.A.S. Diploma, Aquarist Gold Pin, and section award. Best exhibit by Keighley member: D. Mosley. Society gaining most points: Aireborough and District. Guppies: 1, D. Laycock (Sheffield); 2, E. J. Brown (Bradford); 3, Master A. Kaye (Top Ten). Swordtails: 1, Master A. Kaye (Top Ten); 2, Mr. and Mrs. Nuttall (Middleton); 3, M. and D. Laycock (Sheffield). Mollies: 1, Mr. Baker (Castleford); 2, Mr. Leadbetter (Fleetwood); 3, Mr. Beckenham (Oldham). Platies: 1, G. Kaye (Top Ten); 2, Mr. Leadbetter (Fleetwood); 3, A. Besley (Bury). A.O.V. Livebearers: 1, Mr. Leadbetter (Fleetwood); 2, Mr. Hall (Aireborough); 3, P. Staniforth (Don Valley). Barbs (up to Rosy): 1, Mr. and Mrs. Wells (Doncaster); 2, D. Moylan (Blakeborough); 3, Mr. Parker (South Leeds). Barbs (over Rosy): 1, Mr. and Mrs. Cohen (Pontefract); 2, A. and C. Colinson (Aireborough); 3, R. Jones (Castleford). Characins (up to and including Bleeding Heart): 1, M. and D. Laycock (Sheffield); 2, M. Cook (Harrogate); 3, Mr. Cartwright (Huddersfield). Characins (over Bleeding Heart): 1, B. and B. Bucker (Morecambe Bay); 2, J. Whiteley (Aireborough); 3, Mr. and Mrs. Mulley (Ind.). Rasboras, Danios, Minnows: 1, T. and C. Smith (Sheffield); 2, Mr. and Mrs. Gilding (Gainsborough); 3, G. Malpas (Castleford). Sharks and Flying Foxes: 1 and 3, G. Thickbroom (Castleford); 2, T. and C. Smith (Sheffield). Fighters (True Colour): 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. Milne (Doncaster); 3, A. Beasley (Bury). Fighters (Multi Colour): 1, A. Curchin (Swillington); 2, Mr. Heap (Keighley); 3, Mr. Hall (Aireborough). Anabantids (up to Thicklip): 1, Mr. and Mrs. Cohen (Pontefract); 2, Mr. and Mrs. F. Burton (Aireborough); 3, Mr. and Mrs. Milne (Doncaster). Anabantids (over Thicklip): 1, Miss A. Gregory (Nelson); 2, C. Gray (Mount Pleasant); 3, Mr. Hall (Aireborough). Toothcarps: 1, J. Whiteley (Aireborough); 2 and 3, J. Mosley (Keighley). Angel Fish: 1, Mr. Wood (Horsforth); 2, Mr. and Mrs. Dickson (Gainsborough); 3, Mr. Sumner (Sandgrounders). Dwarf Cichlids (up to Kribensis): 1, J. Whiteley (Aireborough); 2, Mr. Leadbetter (Fleetwood); 3, L. and P. Graham (E. Lancs.). Cichlids (over Kribensis): 1, Mr. Ormisher (Sandgrounders); 2, P. Grogan (Morecambe Bay); 3, Master A. S. Furness (Castleford). Corydoras Catfish: 1, Mr. Sumner (Sandgrounders); 2, D. and R. Standen (E. Lancs.); 3, Mr. and Mrs. Clark (Aireborough). Loaches and Botias: 1, Mr. and Mrs. Morris (E. Lancs.); 2, C. Beckenham (Oldham); 3, F. Robinson (4 Star). A.O.V. Catfish: 1, J. Baker (Castlefred); 2, Mr. Carl (Worsley); 3, Mr. Hall (Aireborough). A.O.V. Tropical: 1, G. Thickbroom (Castleford); 2, D. Kennedy (Keighley); 3, D. and R. Standen (E. Lancs.). Breeders (Livebearers): 1 and 2, Mr. and Mrs. Cohen (Castleford); 3, E. Parks (Sheaf Valley). Breeders (Egglayers): 1, Mr. Gilding (Gainsborough); 2, Mr. and Mrs. Burton (Aireborough); 3, A. Curchin (Swillington). Pairs (Livebearers): 1, C. Goodman (Oldham); 2, J. Whiteley (Aireborough); 3, G. Thickbroom (Castleford). Pairs (Egglayers): 1, Mr. Leadbetter (Fleetwood); 2, Mr. Ormisher (Sandgrounders); 3, Mr. Waterhouse (Sandgrounders). Common Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1 and 3, J. S. Hall (Aireborough); 2, Mr. Whiteley (Accrington). Shubunkins: 1, J. S. Hall (Aireborough); 2 and 3, C. H. Whitley (Accrington). A.O.V. Coldwater: 1, D. Mosley (Keighley); 2, L. and P. Graham (E. Lancs.); 3, S. Walsh (Accrington). Juniors A.V. Coldwater): 1, Master Jones (Keighley); 2, Master Furness (Castleford); 3, Master Barrett (Castleford). Juniors A.V. Egglayers: 1, Master M. Holmes (Castleford); 2, Master Barrett (Castleford); 3, Master Thickbroom (Castleford). Juniors A.V. Livebearers: 1, Master Heptinstall (Castleford); 2, Master Marshallsea (Oldham); 3, Miss Gregory (Nelson). A.V. Marines: 1, J. Hallam (Ind.); 2, Mr. Jones (Castleford); 3, Mr. Stewart (Aireborough).

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THE **Gloucester Fishkeeping and Social Club** held their monthly meeting at the Hucclecote Community Centre with R. E. H. Moulder as chairman who welcomed all members and visitors, and also the three new members. J. Bartlett presented a slide show on Livebearers, which proved very interesting, and very enjoyable to all present. The table show was in two sections, Tropical and Coldwater. These were judged by B. Stoneham, who was the founder of our Club, and it was a pleasure to to have him at the meeting once again. The results, however, proved a surprise as both shows were won by lady members.

In the coldwater section Mrs. J. Mitchell was first and fourth, A. Lamb second and T. Collier third. The tropical section was for Catfish, and the results were: first, Mrs. E. Adlam, David Merrett, junior, being second, just beating his father who was third, and a junior, R. Bowd, was delighted when he was placed fourth. The extended table shows have proved very successful and have increased the interest of all members at the monthly meetings.

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THE **Wrexham T.F.S.** members had two very enjoyable evenings at which a talk on all glass tank making was given by T. Pound, and members were encouraged to have a try at glass cutting themselves. After which a slide show on open shows and furnished aquaria was shown.

R. Mathers gave a talk on breeding Fighters which also included foods and feeding. The table show was won by Miss V. Jones with a Cherry Barb. Second and third being R. Mathers. Highest pointed junior awarded to Master S. Lewis (Tiger Barb). Meetings are held on the second and last Thursday each month at the Fellowship Hall, Bradley Road, Wrexham.

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THE **Billingham A.S.** table shows results for March were: Sharks and Labeos: 1, A. Crossley; 2 and 3, Mr. and Mrs. Anderson; 4, D. Sadren. Catfish and Loaches: 1, Q. Watt; 2 and 3, J. Ryan; 4, J. Attwell.

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TABLE show results of the **Stockton-on-Tees A.S.** for 12th March were as follow: Catfish: 1, 2 and 4, K. Greenly: 3, A. Saunders. Guppies: 1, 2 and 3, Q. Watt; 4, B. Foster.

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MEMBERS of the **Basingstoke A.S.** have had a number of talks on the hobby just recently, the subjects being "Aquariums for Beginners" by J. V. Morrice; "Filters and Filteration" by Dick Mills; "Care of Marines" by R. Fleece, to name but a few, and all have been interesting and informative lectures. Table show results have been as follows: Platies: 1, Ian Winter; 2, M. Strange. A.O.S.: 1, J. Jackson. Novice: 1, R. Onslow; 2 and 3, P. Ronald. Killies: 1, A. Blake; 2, T. Taylor; 3, T. Harmsworth. A.O.S.: 1, J. Jackson; 2, T. Harmsworth; 3, A. Blake. Novice: 1 and 2, P. Ronald; 3, H. Mears. Labyrinths: 1, T. Taylor; 2, A. Marshall; 3, Irene Strange. A.O.S.: 1 and 2, T. Taylor; 3, M. Strange. Novice: 1, A. Marshall; 2, H. Mears; equal 3, J. Jackson and P. Ronald. J. Jackson and A. Marshall have now been promoted from the Novice Class.

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THE final result of the inter-club competition between **West of Scotland Exotic Fish Club** and The East Kilbride Aquarium Club was: Anabantids: 1, P. Gordon (W.S.E.F.C.); 2, L. Brown (W.S.E.F.C.); 3, A. Jackson (E. Kilbride); 4, T. Wilson (E. Kilbride). Breeders: 1, W. Leech (W.S.E.F.C.); 2, P. Gordon (W.S.E.F.C.); 3, J. Fyfe (W.S.E.F.C.); 4, K. McKennie (E. Kilbride). The competition was fought on a home and away basis with a total of 200 fish being shown by the members of each club. West of Scotland won the competition by a margin of 100 points.

At the March convention of the Scottish Federation of Aquarists in Larbit recently, one of the club's members, N. Grant won the Alexander Cross Trophy for the best fish in the show. It is the first time that a member of the club has won such an award. At the same event another member, L. Brown, came first in his class. The results of the W.E.S.E.F.C. table show were as follow: Catfish: 1, N. Grant; 2, I. Young; 3, P. Gordon. Loaches: 1, H. Cameron 2, L. Cameron; 3, J. Campbell. Rasboras: 1, I. Young; 2 and 3, P. Gordon.

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THE **Reigate and Redhill A.S.** has found a new home at the East Surrey Spastics Society Hall, Frenches Road, Redhill, Surrey. At the recent annual general meeting M. Uden was elected chairman, with A. Young as vice-chairman, and J. Wood of 22 Rickman Hill, Coulsdon, Surrey, remaining as secretary. K. Fawcett was re-appointed president, with R. Canacott and W. Leach as vice-presidents.

A long-term programme of activities has been formulated, and at the annual auction the Society was pleased to welcome a very large number of new faces. At the following meeting, again very well attended, an old friend from Mid-Sussex, J. Burtles, gave a talk on Botias and Loaches, an instructive and well-prepared lecture, which was very much enjoyed by members. At the table show too, a greatly increased number of entries were received for the annual club cup competitions. Winners were: Live Bearer Breeders Cup: M. Davey (a new member); Egglayers Breeders Cup: K. Norris; Corydoras Cup: J. Wood; Fighter Cup, J. Wood; Characin Class: C. Thorpe.

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RESULTS of the table show at the March meeting **Bristol A.S.** were:

Guppies: M. Howe. Cichlids: 1, E. Bowden; 2 and 3, D. Saphier. Characins: 1, Miss Morgan; 2, E. Bowden. Goldfish: 1 and 2, W. Ham; 3, S. Lloyd. Orandas: 1 and 2, S. Lloyd. Fantails: 1, 2 and 3, S. Lloyd. There was a total of 31 entries and Mr. E. Newman found it a hard job judging the tropical fish. After the interval he answered many and varied questions about the hobby.

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THE **Horsforth A.S.** in future will be known as the **Horsforth and District A.S.** The new headquarters are now at the new Civic Hall, Stanningley Road, Pudsey, and new members are welcome to come along to the meetings which will be held in the Green Room at 8 p.m. on the first Tuesday in each month. The phone number of the honorary secretary (P. J. Smith), is now Leeds 675712. Arrangements are in hand for a full year's social activity. Details of the open show which is to be in December are to be announced later.

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AT the **Midland Aquarium and Pool Society** annual general meeting, the following members were elected to office: Chairman: A. Aldridge; Chairman Elect: A. Roberts; Secretary: C. W. Davies, 8 Redhill Road, West Heath, Birmingham B31 3LD. Treasurer: S. Green; Newsletter Editor: Mrs. J. Cooper; Table Show Secretary: T. Young; Asst. Table Show Secretary: C. Poyser; Librarian: Mrs. D. Aldridge; Asst. Librarian: A. Aldridge. Committee: F. Close, J. Fellows, M. Mason, F. A. Smith. Junior Members' Rep.: Miss K. Cooper. The Society hold their meetings on the third Thursday each month in room 5 at Ladywood Community Centre. Visitors and new members always welcome.

At a recent committee meeting, the future of the annual open show was discussed, and it was decided that once again the show should be staged at the usual venue, Bingley Hall. This decision was not taken lightly, because of last years' financial set-back and some members were in favour of discontinuing the show. However, other members took the view that the Society should endeavour to keep the show going, since it is the only show of its kind in the Midlands. The show is from Wednesday, 15th August till Saturday, 18th August. The Midland Aquarium and Pool Society will stage the exhibition and Aquarists are asked to support the Society by visiting the exhibition during the above dates, so helping the Society to continue staging this type of exhibition in the Midlands.

THERE was quite a successful meeting of the **Wisbech and District A.S.** in February. The discussion was about "Setting up a Marine Aquarium" and was given by P. Hempson who is quite an expert in this field of Fishkeeping. The winners of the bench show were: 1, Mr. Mews; 2, Mr. Edwards; 3, Mr. Goodale. The other talk for February was cancelled at the last minute due to unforeseen circumstances but Mr. Edwards stepped in and gave a talk on "Cichlids," Mr. Handley gave one about "Gouramies" and Mrs. Hooks gave a short talk about breeding "Egglaying Toothcarps".

The winners of the Cichlid bench show were: 1 and 2, Mr. Handley; 3, Mr. Mews.

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THE following officers were elected and will serve for the coming year for **Kingston and District A.S.**: President: H. Towell; Chairman: D. W. Ellis; Secretary: Mrs. J. Rowe, c/o. 51 Mount Road, New Malden, Surrey. Treasurer: K. Barrett; Show Secretary: D. Mackay; Asst. Show Secretary: J. Pollard; P.R.O.: E. Farley; Committee: R. Cooper.

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AT the Annual General Meeting of the **Privateers A.S.**, the following officers and Committee were elected: President: E. Bowers; Vice-President: B. Morrell; Hon. Treasurer: B. Stein; Public Relations and Equipment Officers: A. Payne; Committee: Messrs. J. Hudson, A. O'Neil, B. Morrell. Hon. Secretary: F. W. Coles, 18 South Hill Drive, Gilstead, Bingley, Yorkshire, BD16 3NR. Hon. Show Secretary: R. Whitaker, 4 Birklands Terrace, Shipley, Yorkshire.

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THE results of the table show at the March meeting of the **Brighton and Southern A.S.** were as follow: D. Cichlids: 1 and 3, Mr. and Mrs. Feek; 2, Mr. and Mrs. Corbin. Db. Cichlids: 1, H. Maddison; 2, Mr. and Mrs. Feek; 3, Mr. and Mrs. Corbin. This was judged by Cyril West, F.B.A.S. While judging was in progress, Dr. Neville Carrington gave a very intersting talk on his recent visit to the Far East, where he saw a great many fish farms.

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RESULTS of the **Horsford and District A.S.** annual members show were as follow: Barbs: 1, C. Corns; 2, P. J. Smith. Catfish and Loach: 1, P. J. Smith. Characins: 1, C. Corns; 2, M. Gornall. Juniors: 1, Master Gornall; 2, Master Holdsworth. Anabantids: 1, C. Corns; 2, J. Woods; 3, P. J. Smith. Cichlids: 1, J. Woods; 2 and 3, Mr. and Mrs. Runnacles. Livebearers: 1, Mr. Dunn; 2, Mr. Gornall. Pairs: 1, J. Woods; 2, P. J. Smith; 3, Mrs. J. Dickinson. Best in Show was J. Woods (Marble Angel).

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THE **Rossington A.S.** will be holding its first annual open show at the Miners' Welfare Hall, West End Lane, Rossington, Doncaster, Yorks., on Sunday, 16th September, 4975. Show secretary: M. Duffy, 3 Sherwood Road, Rossington, Doncaster.

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THE March meeting of the **Weymouth A.S.** was attended by 44 members. A slide show on Cichlids was the main event of the evening after which there was a small quiz. Members were also able to see again the slides of the Weymouth open show for 1972.

The Chairman welcomed two new members. As the F.B.A.S. judge was not present A. Cox judged the table show of Tropical Catfish, A.O.V. and Corydoras and Brochis, the results of which were: A.O.V. Catfish: 1 and 2, K. Forrester; 3, Master P. Taylor. Corydoras and Brochis: 1, K. Forrester; 2, E. Warbridge; 3, Mrs. M. Mackie; 4, T. Edwards.

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FILMS WANTED

New Mills and District A.S. would like to borrow or hire films and slides, etc., on any aquatic subject. Secretary: Anthony A. Coffey, "Graywalls", 7 Longlands Road, New Mills, Stockport. Phone 0663 43889.

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NEW SOCIETIES

A new society has been formed in Sutton-in-Ashfield, Notts., and would welcome new members. The secretary is C. Smith, 19 Victoria Street, Stanton Hill, Sutton-in-Ashfield, Notts. NG17 3GB. Tel: Sutton-in-Ashfield 3122.

Worsley and District A.S. secretary: Mrs. J. Knowles, 12, Medway Road, Worsley, Manchester. Tel: 061-790 5142.

A new Society has been formed, namely the **Corringham and District A.S.** Twenty-eight keen fishkeepers met at the Community Centre, Stanford-le-Hope early in March and it was agreed to hold club meetings at the Community Centre, Corringham Road, Stanford-le-Hope on the first and third Wednesdays in the month from Wednesday, 21st March. The club will welcome any keen aquarist or persons interested in the hobby.

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SECRETARY CORRECTION

The secretary of the **Manchester Section, F.G.A.,** is D. Glen, 16 Nuttall Avenue, Whitefield, nr. Manchester, and not as given in our March issue.

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CANCELLATION OF SHOW

The **Priory A.S.** Show has been cancelled owing to a change in internal arrangements. It was originally scheduled for 3rd June.

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CHANGE OF SHOW DATES

Due to a clash of dates with the neighbouring South Shields club, the **Mount Pleasant A.S.** have selected the 1st July as the new date and the venue is the Saltwell Senior High School, Gateshead.

The **Thorne A.S.** Show date has been transferred to the 2nd September.

The new date of **Billingham A.S.** Open Show is 15th July.

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SECRETARY CHANGES

Bristol Tropical Fish Club: L. J. Hudd, 64 Kingston Road, Southville, Bristol.

Ashington and District A.S.: H. Kennard, 8 Tossom Place, Ashington, Northumberland, NE63 9LG.

Gosport and District A.S.: Miss K. Howell, 34 Long Drive, Powner, Gosport, Hants.

Tonbridge and District A.S.: Mrs. I. Billingham, 39 St. Mary's Road, Tonbridge, Kent.

North Warwickshire A.S.: Mrs. R. Hume, 69 Orton Avenue, Walmley, Sutton Coldfield, B76 8JJ.

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AQUARIST CALENDAR

6th May: Oxran A.S. Open Show will be held in the Oxran Recreation Hall, Refuge Street, Shaw, Oldham.

6th May: Roehampton A.S. Open Show. Further details to follow. Any information, contact show secretary, Derek Lambourne, 7 Wheeler Court, Plough Road, SW11 2AX. Tel: 01-223 2630.

6th May: The M.A.A.S. Inter Society Show at Drayton Manor Park.

12th May: Port Talbot and District A.S. Annual Open Show at the Y.M.C.A. Buildings, Port Talbot. Show secretary, A. E. B. Fouracre, 3 Cross Street, Velindre, Port Talbot, Glam.

13th May: The Second Annual Open Show of the Gloucester A.S. will be held at the Gloucester Education and Leisure Centre, Painswick Road. Schedules from the show secretary, Mike Brooks, 114 Melbourne Street, Gloucester, from February on

13th May: Corby and District A.S. Open Show, at the Corby Civic Centre. F.A.B.A.S. Details and schedules from the show secretary, A. Slow, 176 King Street, Kettering, Northants.

13th May: Derby Regent A.S. Open Show. Sherwood Foresters Recreation Centre (Normanton Barracks), Osmaston Road (A5111), Derby. R.A.C. sign posted. Show Secretary: R. G. Harlow, 180 Mansfield Road, Derby. Tel.: 44322.

13th May: Croydon A.S. Open Show at Sir Phillip Games Recreation Centre, Moorland Avenue, Croydon, Surrey. Show schedules from A. Smith, 3 Hindhead Way, Wallington, Surrey.

17th-19th May: The Second National Welsh Open Show will be held at the Central Hall, Tonypandy, Rhondda. Show secretary, M. Williams, 122 Top Trebanog, Trebanog, Rhondda, Glam.

19th May: Southend, Leigh and District A.S. Open Show, to be held at St. Clement's Hall Rectory, Grove, Leigh-on-Sea. Schedules available from Show Secretary, D. C. M. Durrant, 172 Trinity Road, Southend-on-Sea, Essex. Tel.: Southend 610576.

19th May: Whiteway and District Fishkeepers Society First Open Show, Whiteway Community Centre, Kelston View, Whiteway, Bath. Schedules available from secretary, S. V. Daniels, 21 Haycombe Drive, Whiteway, Bath, BA2 1PG.

20th May: Yeovil and D.A.S. Open Show, the School Hall, Church Street, Martock, nr. Yeovil. Schedules from M. Hulbert, 62 Meadow Road, Yeovil, Somerset.

20th May: Goole and District A.S. Open Show. Provisional date.

20th May: Merseyside A.S. Annual Open Show, The British Legion Club, Holyoake Hall, 2 Cramond Ave., Liverpool, L18 1EG.

20th May: Kettering A.S. Open Show at the St. John Ambulance Centre, Fuller Street, Kettering. All information and show schedules can be obtained from R. Vickers, 141 St. John's Road, Kettering, Northants.

26th-27th May: Tottenham & District A.C., Open Show at the Old Drill Hall, High Road, Tottenham, N.17. Schedules may be obtained from K. Nutt, 99 The Avenue, Tottenham, N.17.

27th May: The 1973 Fancy Guppy Association World International will be held at the Glebe Farm Community Centre, Stechford, Birmingham. Show schedules are available from the show secretary, D. R. Beachams, 17 Pedmore Close, Woodrow South, Redditch, Worcs. Open to the public at 3 p.m.

27th May: Weymouth A.S. Open Show will be held at The Small Sidney Hall, Weymouth. Show Setretary, A. Worth, 67 Queens Avenue, Dorchester, Dorset.

27th May: Boston A.S. Open Show, Blackfriars Theatre, Boston. Schedules from S. Noble, 175 Wood Farm Road, Boston, Lincs.

27th May: Middleton & District A.S. 2nd Open Show. Full details may be obtained from The Show Secretary, R. Forsyth, 61 Sandy Lane, Middleton, Manchester (s.a.e. please).

2nd June: Bristol Aero Aquarist third Open Show, at Wesleyan Church Hall, Bryants Hill, St. George, Bristol, 5. Enquiries to Show Secretary, G. Sprake, 134 Yew Tree Drive, Kingswood, Bristol, BS15 4UF.

3rd June: Bournemouth A.S. Annual Open Show at Kinson Community Centre, Pelham Park, Bournemouth. Show Secretary, J. V. Jeffery, 30 Braemar Avenue, Southbourne, Bournemouth, BH6 4JF.

3rd June: Accrington and District A.S. Open Show at St. John Ambulance Drill Hall, Bull Bridge, Accrington, Lancs. Schedules, etc., from S. Walsh, Show secretary, 133 Lammack Road, Blackburn, Lancs, BB1 8LA.

3rd June: Loughborough and District A.S. Open Show will be held at the Sports Centre, Granby Street, Loughborough. Show Secretary, I. Purdy, 10 Cleveland Road, Loughborough, Leicestershire, LE11 2SP.

3rd June: South Derbyshire and District A.S. Annual Show (Members), Good Companions Club, Church Gresley, nr. Burton-on-Trent. Show secretary, R. Brabbins, 42 West Mead Road, Barton, nr. Burton-on-Trent.

3rd June: Sudbury A.S. First Open Show, St. Andrews Church Hall, Harrow Road, Wembley, Middlesex. Schedules from L. Brazier, 66 Ormesby Way, Kenton, Middlesex.

3rd June: Half Moon A.S. second Annual Open Show to be held at the Port Clarence Social Service Centre, Port Clarence, near Middlesbrough. Details from show secretary, P. McGee, 21 Allington Drive, High Grange, Billingham.

9th June: Vauxhall Motors Aquarist Section first Open Show; in conjunction with the Vauxhall Motor Sports Day Spectacular. All enquiries to A. Philip, show secretary, 15 Hollybush Road, Luton, Beds.

9th June: Llantwit Major A.S. Open Show, The Town Hall, Llantwit Major. Show secretary, J. J. Edwards, "Glanafon," Mill Park, Llanblethian, Cowbridge, Glamorgan, CF7 7BG.

9th June: Havant and District A.S. Third Open Show at St. George's Hall, Waterlooville. Show secretary, V. B. Hunt, "Caeglas," 120 London Road, Widley, nr. Portsmouth, Hants.
10th June: Lincoln and District A.S. Show Secretary, H. Kuhn, 44 Scorer Street, Lincoln.
10th June: G.K.N. Pond and Aquarium Society second Open Show at G.K.N. Canteen, Salisbury Street, Darlaston, Staffs. Show details available from Ken Rowley, hon. show secretary, 156 Wolverhampton Street, Darlaston, Staffs.
10th June: High Wycombe A.S. Open Show. The venue will be Lane End Village Hall, Lane End, High Wycombe, Bucks.
10th June: Bishop Auckland A.S. Fifth Annual Open Show to be held in the Y.M.C.A., Proudfoot Drive, Woodhouse Close Estate, Bishop Auckland. Details later.
10th June: Arbroath A.S. Open Show, Community Centre, Arbroath. Details from Tony Clarke, 3 Warddykes Road, Arbroath, Angus. Tel: Arbroath 3395.
17th June: Swillington A.S. Annual Open Show will be held at John Smeatons School, off Barwick Road, Leeds, 14.
17th June: Freelance A.S. Open Show, Amersham Community Centre, Thurlow Street, S.E.17. For details contact J. Stamp, 72 Redmand House, Lant Street, Borough, S.E.1.
17th June: Hetton County A.S. Third Annual Open Show, at the Hetton Community Centre in South Market Street, Hetton-le-Hole. Details later.
17th June: Bishops Cleeve A.S. Open Show at the T.A. Centre, Arle Road, Cheltenham, Glos. Schedules from show secretary, Mrs. J. Hawkins, 44 Burton Street, Cheltenham, Glos.
17th June: Salisbury and District A.S. Open Show at the City Hall, Fisherton Street, Salisbury, Wilts.
17th June: Northwich & District A.S. 5th Open Show, Hartford Secondary Boys School, Chester Road, Hartford, Northwich. Details from Show Secretary: Mrs. D. J. Thorne, 28 Whitegate Road, Wimsford, Cheshire. Tel.: Winsford 3380.
17th June: Fancy Guppy Association (Lancaster Section) Open Show, Gregson Institute, Moor Lane, Lancaster. All particulars from Show Secretary, J. F. Peek, 5 Ridge Street, Bulk, Lancaster.
23rd June: Dunmow and District A.S. Open Show at the Foakes Memorial Hall, Gt. Dunmow. For further details please contact show secretary, D. McMurdie, 37 Capel Road, Rayne, nr. Braintree.
24th June: Littlehampton and Bognor A.S. Inter-Club Show and Annual Exhibition, Western Pavilion, Littlehampton, Sussex. The Exhibition may be extended to Saturday, 23ed June. More details later.
24th June: Alfreton and District A.S. Annual Open Show, to be held at the Adult Education Centre, Alfreton Hall, Alfreton. Details from the show secretary, B. Hickling, Parkview, 13 Coppice Drive, Eastwood, MG16 3PW. Tel.: Langley Mill 5104.
24th June: Dudley & District A.S. first Open Show at the Blind Institute, Wolverhampton Road East, Sedgley. F.B.A.S. Show schedules available from Show Secretary, W. A. Hickman, 29 Ladbrook Grove, Lower Gornal, Dudley, DY3 2UP, Worcestershire.
24th June: South Shields A.S. second Open Show, Bolingbroke Hall, Bolingbroke Street, South Shields. Benching noon to 2.45 p.m. Show secretary J. A. Cutting. Phone Boldon 4259, or write 53 Dunelm Drive, West Boldon, Co. Durham.
28th-30th June: Bristol Tropical Fish Club. 13th Open Show at Congregational Church Hall, Newton Street, Bristol, 5. Show schedules available from assistant secretary, T. A. Coggins, 36 Leighton Road, Southville, Bristol, BS3 1NT.
30th June: Basingstoke and District A.S. Open Show at the Carnival Hall, Basingstoke. Schedules from R. Rich, 93 Pinkerton Road, Basingstoke, Hants.
1st July: Exeter and District A.S. Open Show. Further details later.
1st July: Chelmsley A.S. Open Show. Schedules and further information from show secretary, Mr. J. Aldsey, 4 Shenton Walk, Kingshurst, Birmingham.
1st July: Mount Pleasant A.S. (revised date). Venue Salwell Senior High School, Gateshead.
7th July: G.S.G.B. Quarterly Meeting, 2.30 p.m. Conway Hall, Red Lion Square, Holborn, London. Goldfish for Beginners' Part Three. R. Whittington. A talk by our Technical Director, J. Bundell. Feeding the Young Goldfish. Panel. Table Classes. Refreshments available.
7th July: Boreham wood & D.A.S. First Annual Aquascape and Furnished Aquaria Festival. Further information and schedules from D. J. Crucefix, 64 Milton Drive, Boreham wood, Herts, WD6 2BB.
7th-8th July: Dagenham Town Open Show, Central Park, Dagenham. Show schedules from show secretary, D. G. Kent, 74 Lynwood Drive, Collier Row, Romford, Essex, RM5 2QT. Tel: Romford 67804.
8th July: Grantham and District A.S. Fourth. Open Show, at the Walton Girls County Secondary School, Kitty Briggs Lane, Grantham. Details from the show secretary, C. J. Shipman, 40, New Beacon Road, Grantham, Lincs. A "Y.A.A.S." Show.
8th July: Ashington, Blyth and District A.S. Second Annual Open Show. Details to follow.
14th-15th July: The Aquarist and Pondkeeper Fishkeeping Exhibition, Alexandra Palace, Wood Green, London, N.22.
15th July: The Sandgrounders' A.S. Third Annual Open Show. Full details later.
15th July: Billingham A.S. 3rd Annual Open Show, at Billingham Community Centre, Billingham Town Centre. Schedules available mid-May from: J. Attwell, 34 Hatfield Place, Peterlee, Co. Durham. Tel.: 4185; and A. Crossley, 32 Sledwick Road, Billingham.
29th July: Oldham & District A.S. Annual Open Show, at Werneth Park, Oldham. Schedules (when available from Show Secretary: E. Birchwood, 30 Inverness Avenue, Blackley, Manchester, 9.
5th August: Blackpool and Fylde Open Show. The venue is the Norbreck Castle Hotel, Norbreck, nr. Blackpool.
5th August: Tonbridge and District A.S. F.B.A.S. and K.A.A.S. second Open Show at Tonbridge School, Tonbridge, Kent. Show schedules from show secretary, I. T. Mathieson, 33 Nortons Way, Five-Oak-Green, Tonbridge, Kent.
6th-11th August: The Portsmouth A.S. Annual Open Show at St. Patrick's Hall, Winter Road, Southsea, Portsmouth. Setting up day will be Saturday 4th August, judging on the 5th. Show schedules are obtainable from J. Stillwell, 34 Salcombe Avenue, Copnor, Portsmouth, Hants.
12th August: North Staffs. A.S.
12th August: Grimsby and Cleethorpes A.S. second Open Show at the Memorial Hall, Cleethorpes. Schedules can be obtained from the Show Secretary, T. P. Walker, 51 Chesire Walk, Willows Estate, Grimsby, Lincs.
12th August: North Staffs. A.S. Open Show at Cobridge Drill Hall, Waterloo Road, Cobridge, Stoke-on-Trent. F.N.A.S. rules. Details: K. Ankers, 4 Castle Street, Chesterton (phone 739 564409), or J. S. Booth, 536 Beverley Drive, Bentilee, Stoke-on-Trent, Staffordshire.
15th-18th August: Midland Aquarium and Pool Society, Bingley Hall, Birmingham.
18th-19th August: Harwich and District A.S. Annual Show to be held at The Queens Hotel, Dovercourt High Street.
19th August: Huddersfield T.F.S. Annual Open Show. Details to follow.
19th August: Valley A.S. Open Show to be held at Civic Hall, Ramsbottom. Show secretary, M. Berry, 8 Leyland Street, Blackford Bridge, Bury, Lancs. Tel: 061-766 8574.
19th August: Stroud & District A.S. Open Show. Mid Gloucestershire Technical College, Stratford Road, Stroud, as last year. Show Secretary: Mrs. D. Cole, The Hill, Randwick, Stroud.
19th August: Creswell and District A.S. second Annual Open Show at the Worksop Sports Centre, Valley Road, Worksop, Notts. Show secretary Mrs. R. Foster, 15 Hemmingfield Crescent, Worksop, Notts.
26th August: Fleetwood A.S. First Show at The Fleetwood Grammar School, Poulton Road, Fleetwood.
2nd September: Thorne A.S. Annual Open Show.
2nd September: Lucas Pool and Aquarium Pool Society 3rd Open Show at same venue as last year: Spring Road, Birmingham. Schedules from: Show Secretary, K. Thomas, 11 Alston Road, Solihull, Warks.
2nd September: Bethnal Green A.S. Open Show, Bethnal Green Institute, 229 Bethnal Green Road, London, E.2. F.B.A.S. Supreme Championship Trophy class C2 (Large Characins). Schedules and further details from: Mrs. S. Hedges, "Koi Kornor," 150 Ashburton Ave., Seven Kings, Ilford, Essex, IG3 9EL. Phone: 01-590 3239.
8th September: Three Counties Group Annual Open Show. Show secretary, John Horsey, 4 Rickman Close, Woodley, Reading, Berks.
9th September: Nuneaton A.S. Sixth Open Show.
9th September: Newbury and District A.S. Open Show. Full details later.
9th September: Barnsley T.F.S. Ninth Annual Open Show at The Mapplewell, Staincross Village Hall.
9th September: One Day Open Show Harlow A.S., at Moot House, Harlow. Show Secretary: Steve Jordan, 48 Whitewaits, Harlow, Essex.
9th September: Peterlee A.S. 11th Open Show. Schedules available later from Secretary, A. D. Bebbington, 40 Marlborough Road, Hastings Hill, Sunderland.
14th-15th September: Bristol A.S. Open Show. All enquiries to H. N. Bowden, 12 Stoneleigh Walk, Knowle, Bristol, BS4 2R1.
15th September: Weston-super-Mare and District T.F.S. Fourth Open Show at St. Johns Hall, Oxford Street, Weston-super-Mare. Show manager, J. Clarke, St. Judes, North Street, Cheddar.
15th September: Hounslow and District A.S. Annual Open Show at the Youth Centre, Cecil Road, Hounslow, Middlesex. All enquiries to show secretary H. Pratt, 23 Woodlawn Drive, Feltham, Middlesex. Phone: 01-894 0923.
16th September: Grimwood A.S., Skelmersdale, Lancs. Second Annual Open Show to be held at the Quarry Bank Community Centre, Ormskirk Road, Skelmersdale. Details from J. B. Handford, secretary, 55 Thurston, Skelmersdale, Lancs. Tel. 24900.
16th September: Buxton and District A.S. Third Open Show at the Pavilion Gardens, Buxton. Schedules from the show secretary, A. Holland, 8 Midland Terrace, New Mills, Via Stockport, Cheshire.
16th September: Stone A.S. Open Show. Full details later.
16th September: Rossington A.S. first Open Show at the Miners' Welfare Hall, West End Lane, Rossington, Doncaster, Yorks. Show secretary, M. Duffy, 3 Sherwood Road, Rossington, Doncaster.
23rd September: Torbay A.S. Open Show, at the Torquay Town Hall. Further details later.
23rd September: North Kent Open Show. Schedules and details available later from P. W. Cottle, 2 Challenge Close, Riverview Park, Gravesend. Tel: 0474 63862.
30th September: Northampton and District A.S. Open Show at the Drill Hall, Northampton. Schedules will be available shortly from G. Allatt, 80 Chiltern Avenue, Northampton.
30th September: Pelsall A.S. second Open Show will be held at the Pelsall Community Centre, Pelsall, nr. Walsall, Staffs. For further details, apply 6 Wilners View, Pelsall, nr. Walsall, Staffs.
30th September: Chesterfield and District A.S. Annual Open Show. Venue Clay Cross Social Centre, Chesterfield Road, Clay Cross, nr. Chesterfield, Derbyshire. Exit 29 off M1. Follow signs four miles to show. The spacious venue is situated on the A61. Benching 12-2.15 p.m. Schedules from D. Stone, 237 North Wingfield Rd., Grassmoor, Chesterfield, Derbyshire, S42 5ER. Tel: Staveley 2775.
30th September: The Hucknall and Bulwell A.S. are holding their Annual Open Show at Bulwell Youth Club, Coventry Road, Bulwell, Nottingham. Benching is from 12 noon until 2 p.m. Schedules can be obtained from J. Sutcliffe, show secretary, 273 Wicklow Court, Basford, Nottingham.