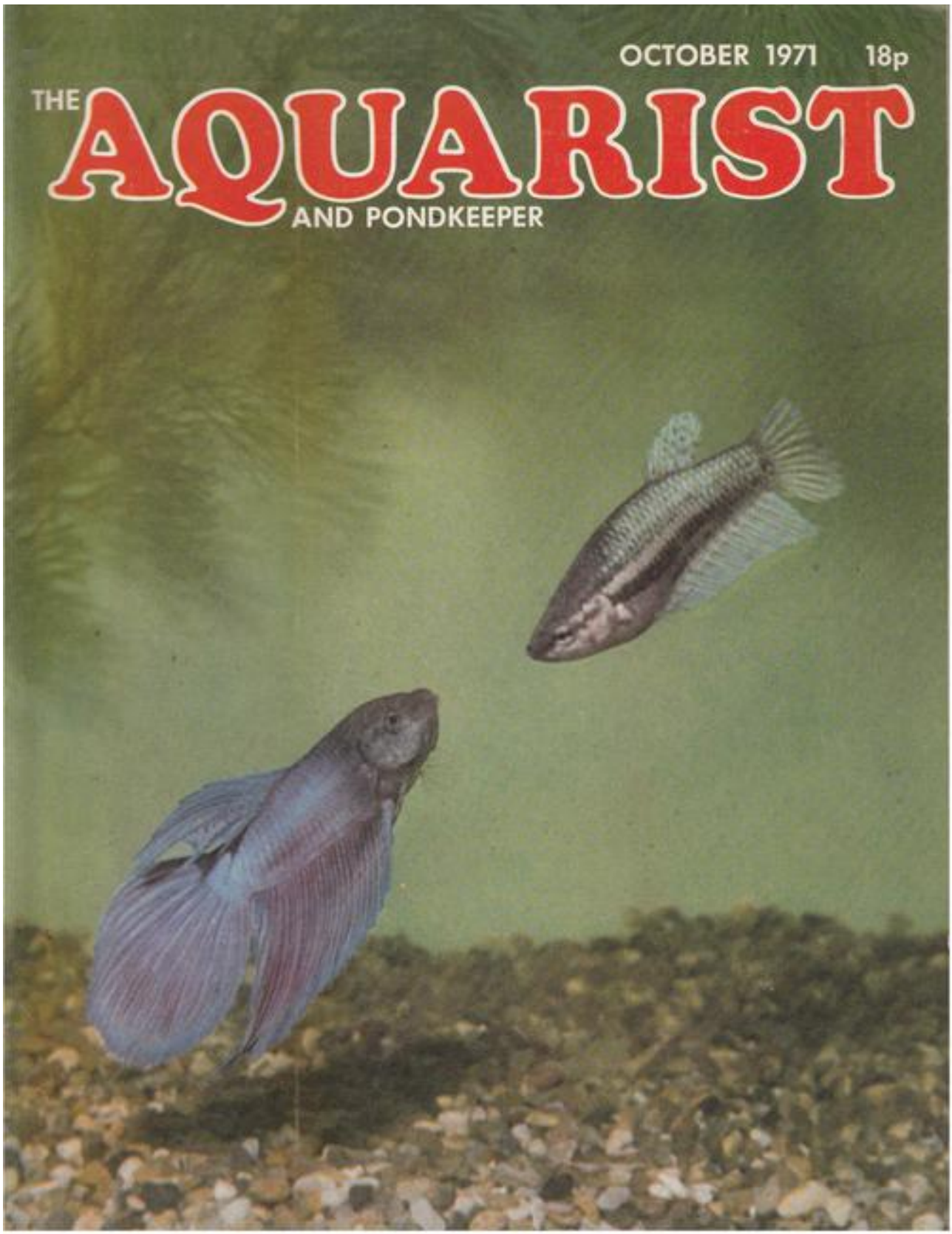
OCTOBER 1971 18p

THE AQUARIST AND PONDKEEPER



THE AQUARIST AND PONDKEEPER

Published Monthly 18p

Contents

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

Subscription Rates: The Aquarist will be sent post free for one year to any address for £2·71. Half-yearly £1·36

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

Founded 1924 as "The Amateur Aquarist" Vol.XXXVI No. 7, 1971

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

Our Cover
Siamese Fighting Fish

The Editor accepts no responsibility for views expressed by contributors.

WHAT IS YOUR OPINION?

by B. Whiteside

Photographs by the Author

I HAVE JUST recently returned from a pleasant week's holiday in London—during which I combined visits to theatres, concerts and aquarium shops with another interesting meeting with our Editor. He and I discussed a variety of topics!

During my visits to a number of aquarium shops I found that, as previously, *the* establishment to visit is Tachbrook Tropicals Ltd. Not being in London very often, I have only ever been able to visit a limited number of shops, but I consider Tachbrook Tropicals to be a "must" on the list of the visiting aquarist, and made two visits there during my short stay. From the vast array of fishes, plants and equipment, I was particularly attracted to some reasonably priced good-quality guppies, young discus, and young red Oscars—but, despite the strong temptations to make purchases, I returned home empty-handed, having weighed up the problems of taking fish back home on the plane with me to N. Ireland. In visiting some other aquarium shops I found a great contrast. I was very disappointed with what I found when I made a long journey to the shop of one advertiser who always has a large advertisement in each issue of *The Aquarist*. I imagined a large shop but found it to be even smaller than the smallest aquarium shop in N. Ireland.

This is an appropriate point to air the views of our first letter writer, Mr. A. J. Chapman, of 4 Swifts View, Court Stile, Cranbrook, Kent, who begins his letter: "I don't know how much influence you have with the Editor but I feel you may be in a position to render a service to all those aquarists like myself who are getting a very poor deal from some of the larger dealers. Having restrained my annoyance for some time, I am sure that many readers will join me in requesting a strong protest at misleading and often wildly inaccurate claims made by some of the advertisers in the aquatic press." A few months ago Mr. Chapman visited a large dealer who claimed to have "regular shipments of marines" yet, on his visit there, there were no marine fishes or tanks in sight. The few freshwater fish on display were kept in what he calls "deplorable conditions." When asked where the marines were the assistant, who was busy reading a newspaper, replied: "Marines? What marines?" Mr. Chapman judged for himself and left without making any purchases. At another large dealer's he states that he found only "bread and butter" fishes at inflated prices, and was offered about a tablespoonful of a "revolting, grey, smelly sludge" which, he was assured, was "live Tubifex." His own dealer at home offers 12 ozs. of Tubifex for 25p and has reasonable sized fishes, in good condition, at cheaper prices. Mr. Chapman cites other examples and admits that dealers' stocks must vary from time to time, but he thinks it significant that all his visits—some of which entailed a journey of over sixty miles—were on Saturday mornings, a normally busy period, and yet he found that the dealers' shops, in question, were virtually empty of customers. He did find, however, one large dealer who had a good selection of fishes, at reasonable prices, coupled with helpful and courteous service. He asks if I could help to rectify this situation through my column and says: "If anyone can achieve anything, I am sure you can through the medium of your excellent W.Y.O.?" (Mr. Chapman has raised some interesting points and it would be useful to have other readers' opinions on this subject. I would assume that there is a certain delay between the time when an advertisement is written and when it appears in print and, thus, certain changes in stocks of fishes would be bound to occur, but there are certainly laws which now govern what is stated in advertisements. If other readers could supply concrete information I'm sure that something could be done if, in fact, other readers of the aquatic press agree with what Mr. Chapman says. I know that several years ago many aquarists, including myself, had a lot of bother with one particular advertiser whose advertisements appeared in a variety of gardening and aquarium publications. The end result was that the magazines refused to carry any further advertisements from the particular firm and it soon went out of business. Unfortunately the firm was bankrupt and many of us lost the money which we had sent for specific items).

I have really been "placed on the carpet" for my comments on my tortoise Tojo, which appeared in the August issue. I have been accused of all sorts of cruelty! Before going any further I should like to attempt to make it clear that I abhor cruelty in any form—especially cruelty to children and animals. I should also like to make it clear that, if you read what I wrote in the August issue carefully, you will find that I was not advocating the practise of drilling holes in

tortoises' shells so that they could be tethered. I merely stated that my tortoise, which is older than I, had had such a small hole bored in his shell many years ago. I was only a youngster at the time and took no part in the proceedings, but I remember it being done. At no stage did Tojo show any signs of discomfort either during or after the small drilling job. The tiny hole is on the very edge of his shell and I'm sure that it caused him no more pain than we receive when we have our hair or finger-nails cut.

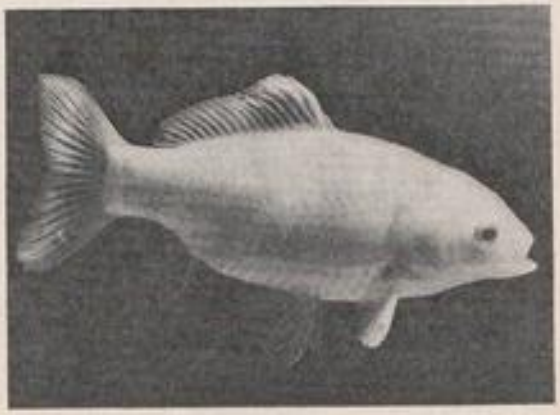
Linda G. Williams is aged 15, and writes from Eddie's Pet Shop, 10 St. John's Way, Corringham, Essex, under the title of "Animal Defender." She says: "I am appalled that you suggest that a hole should be drilled in its shell. The shell is living tissue and considerable pain must be caused. Also the cord could become tangled around its leg, or even its neck, and various objects in the garden." (I would consider that the shell of the tortoise, in the position where the little hole is drilled, is "dead" material—just as hair is dead material.) Linda goes on to say that she works in a pet shop and always advocates the use of a large pen, with shelter from sun and rain, to her customers. She also considers that most tortoises drink quite a lot; at least all her charges get a good, long drink every day. (I often offer Tojo water to drink but he is just not interested—not ever! I am certainly not criticising Linda's advice, which I think is very sound, but in my own defence I would point out that Tojo is a good many years older than Linda and he certainly has thrived despite the little hole in his shell and his lack of desire to drink water.)

Mark Lewis is also 15, and he lives at 3 The Crossways, Wembley Park, Middlesex. His tortoise is kept in a 6 ft. × 6 ft. pen, and it gets daily exercise, outside, under supervision. Concorde by name, Mark's tortoise enjoys, in order, dandelion, lettuce, clover and the occasional tomato. Like Tojo, Concorde will not take any form of liquid. Mark considers that it gets its liquid from the foods which it eats. He also keeps a variety of other animals—including a cat, hamsters which he hopes to breed, six tanks of tropical fishes, and a pond and two cold-water tanks containing many varieties of goldfish. Despite many attempts he has been unable to grow fine-leaved tropical plants such as Cabomba. He would like to hear from any other young readers who would like to exchange views about the animals which they keep.

Mr. H. Roddwell, of 23 Carlton Avenue, Feltham, writes to say that he found my report on Tojo interesting as he has had a tortoise in his household for twenty-five years. It was the only surviving member of the first consignment to arrive in this country after the war, and was given to him by a dealer who was so sickened by the method of delivering tortoises that he has never imported any since then. Mr. Roddwell has never seen Shelly drink water, but it likes to be sprinkled with the hose and goes through a ritual of face-washing with its front feet. Shelly roams the garden from April to late September and likes to eat lettuce, frozen peas and apple. It has also been seen eating rock plants such as Aubretia. Shelly has been observed "eating" a stone, presumably to sharpen its "beak"—an interesting point! It likes company and stands near-by when work is being done in the garden. A creature of habit, it sleeps in the same spot each night. Shelly is a fast mover and nearly every year Mr. Roddwell notices that it has grown—by the lighter rings round its shell.

In the May issue I asked if any readers had found that cigarette smoke had, in any way, affected their fish. I liked the witty reply which came from Mr. M. Wiles of 9 Ferndale Avenue, Edgecumbe Street, Newland Avenue, Hull. He writes: "I have not found any effect on fish as they can't strike the matches to light them because the water makes it difficult!" (True.) On the subject of Gro-Lux Mr. Wiles says that the main reason why it is not successful is that it is not powerful enough. On his freshwater 36 in. × 15 in. × 12 in. tank he has both a Gro-Lux tube and an ordinary light bulb. He has not noticed any change in pH or DH. He finds that Gro-Lux is inclined to produce brown algae and includes the 60 watt bulb which he has discovered slows down the growth of algae and turns it green. Regarding the question of a pond in a small garden, Mr. Wiles says that, in his area, it only attracts stone throwing and so no one bothers with ponds.

This was the only comment I received on garden ponds. I thought there would have been more supporters of garden ponds. I wonder if the common goldfish is as popular as it used to be when I started keeping fish, as a youngster, about twenty years ago. The photograph shows an attractive, common gold-



fish which is about 5 in. long. It belongs to a friend, Mr. R. Workman, whom I would like to thank for

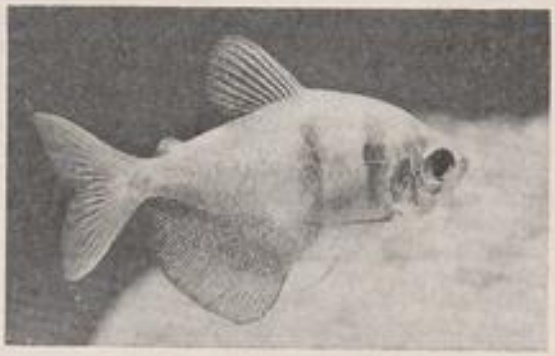
allowing me to photograph the fish. It shares a small tank with another, slightly smaller goldfish. Both were bought when quite small and are kept in a tank without plants. On a diet consisting of Tetramin, they have thrived and grown considerably.

Mr. D. Vaughan writes from 20 Whitchurch Avenue, Gravel Hill, Broadstone, Dorset, BH18 8LP, and he is a coldwater fan. He finds that coldwater fish are usually more interesting, as fish, than tropicals. His favourite fish are two European mudminnows which are fascinating to watch. They ignore the more peaceful fish, but bully the more pugnacious types. He has four bitterlings which are left alone by the mudminnows, but two sunfish had to be separated from them. Mr. Vaughan has used undergravel filters for a few years now and he thinks that they are "marvellous," mainly helping in plant growth. With his filters he has been able to grow, at room temperature, Cryptocorynes, Aponogetons and Indian fern, all of which have been very successful. His favourite book is *The Goldfish*, by Hervey and Hems. As well as the sound information in it he thinks that it is well laid out and a pleasure to look at. Mr. Vaughan thinks that algae don't seem to grow as well with Gro-Lux as with other forms of strip lighting. He ends by asking if anyone knows of any method which could be used to keep coldwater temperatures down below 65°F in summer.

Mr. Underhay lives at 24 Pembroke Road, Paignton, S. Devon, and writes about the problem of dog biscuits going mouldy, when used as a food for whiteworms. He suggests that a thin layer of peat is placed over the biscuits; this keeps out a lot of the air and the worms can still be easily uncovered. His one attempt at aquarium photography gave him a one in thirty six success rate and he sent me a fairly reasonable print of a marine batfish. He considers that the main problems associated with marines concern water management and filtration and he has found that if a high powered U.G. filter, such as the type recommended by Mr. G. Cox, is used, and the tank is not over-crowded, then major problems can be avoided.

Mr. T. Massey, of 22 Cypress Gardens, Yew Tree Estate, Walsall, Staffs., writes on the subject of tortoises. He thinks that it might be painful to drill holes in their shells, particularly with so many maniacs about today, and dreads to think how some "humans" might attempt it. He thinks that my tortoise might drink water if it were provided at all times and says that, unless the animal were watched twenty four hours per day, one couldn't be sure that it does not drink. His used to drink a little. He asks if it is known that 99 per cent of all tortoises imported into this country die within twelve months, due to ignorance and plain cruelty. (It's certainly a frightening figure!) He finds that angels will swim at the front of the tank, when hungry, but will retire to the rear, after being fed, as if frightened. He does not know why but suggests that if less food is given the angels may be seen more frequently.

Mr. S. Fox lives at 126 West Farm Avenue, Longbenton, Newcastle upon Tyne, 12, and he considers that fish often panic because they are particularly sensitive to sound and other vibrations which are transmitted through the fishtank to the fishes. They can pick up vibrations of which we may not be aware. They become accustomed to "normal" vibrations but may panic if subjected to unusual ones. They can also be frightened by objects such as striped shirts which suddenly move close to the front glass of their tank. Regarding the proposed postal plant club, Mr. Fox informs us, with regret, that only four letters were received and, thus, it seems pointless to continue with this idea. He thanks the four people who wrote. (I am sorry to hear that this interesting project should have had to be dropped due to a poor response. I thought that it was a very good idea as aquarium plants are certainly the "poor relations" of aquarium fishes).



I've been making further experiments with my new camera in the field of aquarium photography—with mixed success. My most disappointing experience occurred earlier this week when I set up a small tank, with a black background inside the tank, and went to great trouble to photograph a variety of fishes which I borrowed from the school in which I teach. Having taken thirty six flash shots, on FP4 film, I was convinced that I would have some good shots for future articles. I rushed off and developed the film. I did not get even one useful negative! A careful check showed the cause to be my own stupidity: I had forgotten to set the shutter knob on my camera to the flash position. It was set at 1/125 second and the shutter was 4/5s closed before the flash went off in every case. I do have some good negatives showing the end of the tails of a variety of fishes—but I feel that there would be a rather limited market for such shots! Photographs 2 and 3 were taken on FP4, using flash and extension tubes, and are much more

successful. Notice the difference which a light or a dark background makes to the fish. Although fishes are difficult to photograph, I find that plants are possibly, more difficult. Have any readers tried plant photography?

For next month, please send your opinions on the following topics:—(1) What have been your experiences in breeding the ticto barb or the black widow? (2) Have you tried furnishing an aquarium with only one species of plant? If so, let's hear about your experiences. (3) What have been your experiences with the keeping of the discus? (4) Where does your tortoise usually spend its winter hibernation period? (5) Are dried foods, as some makers claim, as good as live foods?

I'll end by recounting a relevant experience which I recently had as a member of a university team in a radio quiz. The questions asked were of a general nature but you should have seen my finger rush to the buzzer when both teams were asked for the common-name of plants which belonged to the family Nymphaeaceae. Those water lilies made my night!

BOOK REVIEWS

Tropical Marine Aquaria—The Natural System *by R. A. Riseley. Published by George Allen & Unwin at £4·50.*

Mr. Lee Chin Eng of Djakarta, the widely known advocate of the so-called "natural system," was responsible for introducing the author to this method of maintaining marine aquaria. This was many years ago since when Mr. Riseley has enjoyed considerable success with keeping a wide variety of marine creatures in carefully arranged communities.

The author points out that the term "natural system" is a misnomer. Says he, "the system is no nearer reality than a well-lighted, well-planted freshwater tank is to a leaf-filled jungle pool"; but it could be argued that the term is used in reference to the absence of artificial aids in the form of filters, oxygenators, ozonisers etc. In support of the system, the author goes into fascinating detail describing how a variety of life-forms can be included in the marine set-up to control unwanted bacteria, to encourage useful bacteria and to supply oxygen.

The first half of the book deals with Choice of Tank, Tank Arrangement, Tank Maintenance and Feeding, Health of the Aquarium and Breeding and Spawning Fishes. The remaining chapters are also most informative, giving detailed descriptions of many of the popular fishes in addition to molluscs, sponges, corals, crustaceans, echinoderms etc., which can be kept successfully in aquaria. The chapter on corals is most absorbing and contains a description of the breeding process of *Euphyllia fimbriata* which took place in the author's aquarium.

The colour photographs, instead of illustrating fish species for the marine aquaria, provide the reader with a mouth-watering impression of what can be done with various collections of beautifully coloured living corals, starfishes and anemones, the fish being incidental in the same way that butterflies are incidental to the flower garden.

The author is to be envied his geographical proximity to the source of his tank occupants but it is obviously only a matter of time before we, in Europe, will have easier access to supplies of the gorgeous living aquarium furniture which so ably replaces some of the rather prosaic and drab material currently used in most set-ups.

Tropical Marine Aquaria *by Graham F. Cox. Published by Hamlyn at 40p.*

This is a neat, pocket-sized paper-back. Sharing the same title as the work reviewed above, this volume, within the confines of its hundred and fifty-plus pages, introduces the beginner to the "natural, semi-natural and clinical systems." This is pithily dealt with in the first forty-five pages along with pumps, filters and sterilizers etc., whilst the remaining pages describe most of the coral fishes commonly imported from the Red Sea, Caribbean, E. Africa and the Philippines and deals with their basic requirements.

Most of the popular species are excellently portrayed by innumerable coloured drawings executed by George Thompson which will satisfy a long overdue need for those requiring a reliable guide for identifying species and differences between adult and juvenile forms of the same species.

The author is well known for his use of synthetic seawater in conjunction with the "semi-natural system" which has, as its mainstay, a high turn-over rate under-gravel filter.

A first rate book for the beginner, an invaluable reference book for identification purposes and an excellent eight bob's worth.

Coldwater Fishkeeping

by A. Boarder

Mixed pond community of golden orfe, goldfish, hi-goi and koi.

THE POPULARITY of coldwater fishkeeping has increased greatly during the past few years, probably due to the fact that the various types of plastic liners available have made pond construction so much easier. I think that it would be true to say that never before have there been so many garden ponds as there are today. With the increased interest there have naturally been many differing views as to the correct method for keeping the pond water clear and the fishes healthy. The different views are quite logical as no one can be dogmatic about the subject. It seems that whereas in one district a pond can function well with certain conditions or treatment, in another area the same methods can bring near disaster.

The people who claim to know it all have evidently had little experience as the longer I manage a garden pond the more I find that I have plenty to learn and a year never passes without something happening which is quite unexpected and which I have never heard of before. Take, for instance, the ideas about cleaning out a garden pond. Some aquarists declare that they never clean out their pond whilst others make this an annual task. There can be no right or wrong way as one pond can function quite differently to another under what appears to be the same treatment. I suppose that a lot depends on the size of the pond, the amount of water plants, the number and sizes of fishes and the amount or type of food given.

Even in my own garden I have two ponds which never react in a similar manner although with almost similar treatment. There is one big difference, I suppose, in that one is used as a breeding pond and the other is not. The breeding pond is kept almost free of water plants apart from a couple of water lilies, as it would not be possible to collect the eggs

of the fantails if oxygenating plants were all over the pond. As these plants are so restricted the water becomes fairly green with *Algae*. This I do not mind as long as it does not become too thick. The smaller pond has a fairly lush growth of Hornwort (*Ceratophyllum demersum*) and *Egeria densa*, with a water lily. This pond keeps quite clear all the time. It does get a little more shade from the direct sunlight than the larger pond, but I think that the determining factor is the presence of plenty of plant growth.

The lack of underwater plants can present a problem once the water gets very green with *Algae*. This is when the weather turns very hot and sultry and the oxygen content decreases. The question then arises as to whether it was policy to clean out the pond the previous late autumn or not. I consider that the size of the pond is very important with regard to this point as the smaller the pond the more likely is it to become foul if it is not cleaned out every year. My larger pond had not been completely emptied during the past twelve months and I nearly had several fatalities through this. When I constructed my ponds I made a deep pit near the centre of the larger pond so that most of the mulm would probably be washed down into it by the actions of the fishes. A water lily was planted in this deepish hole (about 2½ ft.), and the idea being that the mulm would serve as a fertiliser for the lily.

During the spring and early summer the pond has been functioning quite well and the fantails had spawned on more than one occasion. However, the very hot weather at the beginning of July soon upset the water conditions. On the fourth of the month I saw a large fantail at the surface evidently in trouble. Thinking that the water was slightly impure, I played the hose on it for a time and the fish appeared to become normal. The following day, with the weather still hot, I noticed that the fantails did not seem to be acting as I would have liked and the water appeared to have become foul. I have had this pond running continuously with the strain of fantails for the past thirty-four years and I had never experienced this trouble with the fantails before. On one thundery night I found my Golden Orfe in trouble and got rid of them as I considered that they had outgrown the pond and were not happy.

As the pond water was quite evidently impure I emptied completely and cleaned it out thoroughly. In the deep hole I found four buckets full of black evil smelling muck. When this was removed I played the hose round the sides of the pond and washed all the green *Algae* into the centre where I cleared it out. The pond was then refilled and left for a day before returning the fish. These had been kept in old coldwater cisterns during the clean-up. The following day the fish were returned to the pond and they were immediately at home, swimming about as if nothing had happened. Two days later they were spawning like mad. I had expected this as if there is one thing which encourages a spawning more than another it is the provision of fresh, well-oxygenated water. The fantails continued spawning for another couple of days and plenty of eggs were collected. I use a number of concrete tanks for hatching and these had become full and so I resorted to the use of one or two of the oblong plastic bowls which can be obtained from supermarkets. These are ideal as hospital tanks, being shallow and can also come in useful as hatching containers.

I am certain that if I had not cleaned out my pond when I did I would have lost several if not all of my fish, but the change of water to fresh not only saved all the fish but gave them the incentive to spawn so well. On mentioning my experience to a friend who is a very experienced aquarist, I was informed that he had lost four veiltails during the hot spell from his pond and that they were quite irreplaceable. It seemed strange that after thirty-four years this should have happened in my pond and I can only conclude that the presence of the black mulm in the pond and the excessive heat caused foul gases to form which were gradually poisoning the fish. In future I shall try to clean the pond out every year and I advise anyone who has a medium or small sized pond to do the same.

I remarked in a previous article that I would experiment with the temperatures of the water in my hatching tanks to see if excess warmth had any ill effects on the quality of the fry. From the last spawnings I put many eggs in an unheated coldwater cistern with just a sheet of plate glass over as a protection from birds, etc. I had hoped that the water would remain fairly cool, but it was rarely under 62°F, and sometimes some degrees higher. No aeration was used and a good hatch was observed after just under four whole days. From what I have seen of the fry I cannot see any improvement in the quality of them. I had wondered if the high temperature of a hatching tank would make any difference as to how the fry developed, but I cannot see that it has made any difference at all. There appear to be plenty of single-tailed fish among the youngsters which, having come from double tailed fish, should have been of the same shape. I suppose the hot weather did rather spoil my experiment as I had hoped that the tank water would not have gone much above 60°F.

The coldwater cisterns I have mentioned have been in constant use by me for over twenty-five years and they still hold water. They were treated by me in the following manner. First the holes were stopped up with wooden bungs and then the inside was painted over with a cement and fine sand wash. After a good cleansing to remove any free lime they were put into use and have been a great asset ever

since. A few of the tanks, I have a dozen in use, were partly filled up so that the depth of water is only about nine inches. One could, of course, put only a little water in a tank but it would then be rather difficult to get to the water lower down. I find these shallower tanks very good, either for hatching eggs or for rearing fry. That these tanks still hold water after so many years of use (also the water in them has frozen very thickly on many occasions) is a bit of a mystery to me, but I also repaired a coldwater cistern under my roof with cement and sand during the last war and it still holds water, although a hole in the bottom was stopped up with a lump of cloth before adding the cement.

During the warmer weather it is probable that some of the water plants may need pruning or you may not be able to see the fish. It is important to try to keep a fair balance of plants to ensure a healthy condition but yet not to have too many plants so that the fishes cannot be seen.

BREEDING THE FIREMOUTH CICHLID

by Pamela Hansen

THE Firemouth Cichlid, *Cichlasoma meeki*, is one of the most beautiful of cichlids and my favourite of all the fish we have kept. The colouring is magnificent, the head and upper part of the fish a deep violet, with broad black stripes on the body, the mouth and lower part of the fish a flaming red, which looks as if it had been splashed on with a paint brush. The fins are tinged with turquoise and the rim of the dorsal fin is a bright red. The rims of the eyes sometimes show up as turquoise too; and the fish has two large black spots on either side of the body; one on the gill plate encircled by a white and turquoise ring, and a larger one on the rear upper part of the body.

The Firemouth comes from Guatemala and the Yucatan, in Southern Mexico, and is generally described as being quiet and peaceful. The males grow to a length of from 12—15 cm. and the females are somewhat smaller.

Our first experience with Firemouths was something of a fiasco. We bought what we thought to be a male, and then later a "female" for it. But the "male" developed a large ovipositor and eventually died, apparently because its eggs could not be released. We later sold the remaining fish, still uncertain as to its true sex. The next time we were wiser and bought eight young *Cichlasoma meeki* and placed them in a community tank in the meantime until they matured and paired out. We hoped to make a special tank for them eventually. After six months seven fish remained, and my husband sold two males along with other fish of a different species as the tank was somewhat overcrowded. We were left with what seemed to be two pairs and an extra female. Each pair had laid claim to a certain area of the tank and defended this territory against the opposing pair. Fighting, but not of a serious nature, occurred as part of their territorial behaviour. The two pairs would take up positions opposite each other, spreading out their gill plates, thus exposing the two distinct eye-like spots, and distending the skin beneath the mouth to give a ferocious effect. They didn't seem to mind if the other occupants of the tank, golden swordtails, black and red tetra, lyretail *sphenops*, a pair of marble angel fish, one *Cichlasoma nigrofasciatum* and one *Cichlasoma festivum*, trespassed on their territory. The fish were fed mostly with dried food as it was winter time and we were unable to procure our usual live food.

In April, 1971 we set up a special tank for Firemouths and placed in it our five remaining specimens. It was hard to identify the sexes at first, but the males eventually grew noticeably bigger than the females, and also developed a longer more curly end to the dorsal and anal fins, whereas the counterparts in the female were more rounded. The tank measured 110 × 30 × 25 cm., the water was of a hardness DH 14° and the temperature 26°C. Excessive hardness of the water would not be a drawback in spawning as the Yucantan Peninsula, where *Cichlasoma meeki* is found, is a chalk plateau from the Tertiary age, and thus a hard water area. We placed two large pieces of slate at each end of the tank, leaning against the back glass, to provide two spacious hiding-places. *Sagittaria* and *Vallisneria* were planted in the centre of the tank, allowing space for digging at each end, if required, and to make a kind of border, so that the tank was divided into two separate areas.

For the first few days the fish hid all the time, huddled together behind one of the slates, sometimes one or two showing their heads, sometimes all or some hiding behind the slate in the opposite corner. We fed them liberally with cyclops. After a few days a fish could sometimes be seen crouching in the open in front of a slate, or hiding under some terraced slates

in the centre of the tank. One big plant was uprooted at this time. Four days after the fish had been moved in, we found one of the males in the centre of the tank, rolling around on the bottom, as if it were dying. It had a large white swelling over one eye. My husband immediately removed it to a large jar, with aeration, to which was added one-third of a CILEX tablet (a German medicinal preparation). Nevertheless, the next morning we found the fish dead. I joked with my husband that I could see him going down to the aquarium dealer and buying back at an extortionate price those two Firemouths we had sold there if our fish were to continue dying off. Now we had four Firemouths left and we hoped that this would be enough to be sure that we got a compatible pair.

After a week or two we placed a piece of black paper over one end of the tank, which we thought would lessen disturbance and make the fish more comfortable. The tank was situated in our living-room near two doors and we were often going out and in, opening and shutting the doors. We began to feed the fish with small earthworms from the garden, which they took eagerly. By the beginning of May a pair had definitely formed again. They swam about together in a certain area and fought to defend this area against the other fish. There was a slight indication of an ovipositor, or breeding-tube, in the female. We then lost another female, the cause of death being unknown. The remaining odd female made passes at the male but was instantly chased away by his rightful spouse.

Twenty-eight days after the introduction of the Firemouths into their "special" tank, the pair spawned on one of the pieces of slate: from 150-200 eggs, to our great delight. It all seemed very easy; we had expected greater difficulties in getting the fish to spawn. The eggs were 1-2 mm. in size, sticky, and greyish-yellow in colour. If the female paused for a moment while spawning, the male became immediately aggressive. If the second female neared the limits of the pair's territory (around the centre of the tank) she was immediately chased back to her corner.

By the time the eggs were two days old only nine altogether were seen to fungus, but others may have been removed by the parents. We didn't add anything to prevent fungus of the eggs as *Cichlasoma meeki* eggs are not so sensitive as for example angel fish eggs. When the eggs were three days old the tails burst through and the eggs were then moved by the parents to a hollow in the gravel, expressly dug for this purpose. When five days old the young were transferred to another hollow and became free-swimming at the age of eight days, whereupon we began feeding with micro-worms. We noted that the young spent the tenth night on the bottom, with the mother in the midst of them. As soon as the light was put on in the morning, the young immediately began to swim up from the bottom. We began to feed with cyclops and small *daphnia*, not bigger than the young's eyes, as eye size is food size. The male also ate this fine food and a few times mistook the young for it, upon which he got a biff in the side from the female, and in consequence spat them out again. For this reason one or two earthworms were again fed regularly to each adult fish, after which the male no longer consumed the food intended for the baby fish. Later we added large red *daphnia* to the parent's diet, but only a few, as they also looked too much like the young.

The baby fish developed faint stripes on the rear part of the body. The male and female took turns in attending to the flock of young, which followed around the parent in question. Baby fish are instinctively attracted by the strong colouring of the adult fish; which is one of the reasons why fish display such strong colours while breeding.

We suddenly noticed that the superfluous female was in a dreadful state, with parts bitten away; we had been so absorbed by the young that we had failed to notice how she was getting along, nor how aggressively the pair had been treating her. We transferred her to another tank, but she died the following day. Now we come to think of it, perhaps this pair was somehow responsible for the deaths of all three fish.

Meanwhile the young were growing fine. One month after the spawning we noted that the male was becoming very aggressive towards the female and that the young no longer interested the parents much. There was no longer a parent accompanying the flock of young, which moved around the tank more freely and more spread out than before. We moved the young to a tank measuring $160 \times 30 \times 35$ cm. and containing 168 litres. We were able to count them for the first time: there were 138. They continually swam up and down the tank in a shoal, which looked very impressive; as soon as one decided to swim the length of the tank all the others followed. There are two reasons why fish shoal: (1) it is easier to find food because there are more eyes to look for it, and (2) it is an instinctive reaction to fear; when they swim close together they look like one big fish and thus are more immune to attack. After a week or so in the new tank our fish felt more secure and gradually began to move more freely around again. Three baby fish weren't caught but were left with the parents, as they hid themselves at the time the others were moved. At the age of two months most of the young measured from 2—2½ cm., although one or two measured only 1 cm. The blue colour in the fins and body is now apparent, but there is no red colouring as yet.

Exactly two months after the first spawning the male began cleaning the same slate that was previously used, and three days later the pair spawned again. We hope that this spawning will be as successful as the last one, but are imagining that it might well be difficult to dispose of the young.

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.

COLDWATER QUERIES

by Arthur Boarder

I am making a greenhouse and wonder if it will be all right for me to have a fish tank, under the staging. I shall have some heating in winter but as I shall be growing flowers, I was wondering if any fumigation would harm the fish?

A greenhouse is a good place for a fish tank, as the extra warmth would encourage the growth of the fishes. However the possibility of fumigation is another factor which would have to be considered. One could place a glass sheet over the tank and seal it for a time with plastic tape, but the fumes might be dangerous for some hours after. It would be possible to water plants with a systemic so that they take this up into the sap and so kill pests, and in such a case the fish in a tank would not be harmed.

Is it safe to use cork or bark in a tank as a decoration?

This is often used in tanks and is safe providing it has been boiled first. There may be a tendency for the bark to turn the water acid but this can be watched for and no doubt this would soon pass off and a change of water would make all safe.

I have in my pond a number of young shubunkins. They seem of a good colour. What are the requirements for showing and where could I dispose of the young fish?

The colour of a shubunkin, either a London or Bristol type, should be a blue ground with red, brown, violet and yellow markings, the whole speckled or blotched with black. The shape depends on the type, the London is as for the common goldfish and the Bristol is more stream-lined and has larger finnage. You might sell your fish to a pet shop.

Would you please tell me if the seeds of Laburnum are dangerous to fish if they drop in the pond?

Not only are laburnum seeds poisonous but every part of the tree is also bad. The roots, stems, leaves and flowers are poisonous as well as the seeds. It is probable that only a few seeds in the pond might not do much harm, but it depends on the amount of water as to the concentration of poison.

When I set up my pond I bought a number of plants for it but I do not think that they are of the right kind. Do all plants oxygenate the water?

All water plants do not oxygenate the water. Only those under-water plants are likely to do this. Such ornamental plants as water lilies, water irises, rushes, pickerel weed and the like, will certainly help to keep conditions right by using up much of the waste matter from the fishes with their root systems. Those water plants which send their leaves up above the water cannot oxygenate the water and so one might get the wrong set of plants for the purpose of oxygenation. Most of the plants which send their leaves above the water are really bog plants and would prefer to grow in swamp-like conditions.

I keep goldfish and shubunkins and wonder if you can give me any other foods for them besides packet ones?

Goldfish will eat many foods as eaten by human beings as well as many types of live foods, such as the garden worm, broken maggots, Tubifex, Daphnia, mosquito larvae and those of other insects. They will take many types of soft vegetable matter such as cooked green peas, boiled cabbage, etc.

I have tried hand stripping of goldfish and although I have got eggs they have not been fertile. Why is this?

It is usual to be able to hand strip goldfish when they

are actually spawning or at least in that condition. If you manage to get any eggs or milt from a fish when it is not in such a state it is probable that the eggs will not be fertile. You could try getting the milt from the male first and then add the eggs, I have had success with this method but only when the fish were actually spawning.

If a female goldfish is heavy with eggs and does not lay them, will they turn bad in the fish?

Fishes can hold the spawn for a long time without it turning bad or becoming useless. If conditions are not right or there are no male fish present to encourage them to lay, they can hold the eggs for long periods with no harm to them.

I have lost several goldfish from my pond and they show no signs of injury or disease. They just went off their food, lay on the top on their sides and then died. What is the reason?

When fish die and show the signs as described it is almost certain that they have died either through lack of oxygen or have been poisoned by something in the water. This may have been introduced by someone spraying insecticides near by, or from the decaying of something in the water, either uneaten food or dead vegetation. In the hot weather the water soon gets foul if there is anything in the water; even too much mulm at the bottom can cause bad gases to form, and the warmer the water the worse does the condition of the water become. The remedy is to clean out the pond and add fresh water.

Can you tell me how many inches of fish for a garden pond, per square foot and do I deduct water lily leaves?

The number of fish to a pond depends on the surface area. For a tank it is usual to allow 24 square inches of surface area for each inch of fish, but with a pond one would not use as many fish as this. I would recommend at least twice the space per inch of fish, and the fewer fish the better will they thrive. Ignore the water lily leaves.

Please could you tell me the difference between Tropical goldfish food and ordinary goldfish food?

The difference is often only the price. Goldfish are not fussy and will eat either packet food as sold for coldwater fishes or any tropical fish food. There are many types of food you can add for the diet of your fish and by trial you should be able to find plenty of cheaper foods than some of the packet ones.

Do Higoi grow to a large size and do they grow quickly?

Higoi can grow quite large for the garden pond. The rate of growth can be very fast if they get enough food and have plenty of space. They can grow over a foot long and weigh several pounds. They should only be introduced to a large pond and are not suitable for a pond the size of yours.

Can you identify the creatures I have sent you please?

They appear to be small freshwater limpets. They are not likely to do any harm to your fish.

How can I identify the eggs of goldfish and snails?

Goldfish eggs are small round beads of jelly about the size of an average pin's head. They stick to the water plants or anything they come in contact with. Whilst in the water they are difficult to see as they are transparent. If you lift a bunch of weeds with eggs on into the air, you will then see the eggs quite plainly as they show up with a pale amber colour. Snails eggs are either sausage-shaped bits of jelly or just blobs. The former are the eggs of the Freshwater Whelk and the others of the Ramshorn snail.

I have used coloured pebbles in my tank and now find that they are getting slimy. What is the reason?

Coloured pebbles are unnatural for a tank unless they are of a natural shade. The slimy appearance is no doubt caused by over-feeding with dried foods. The uneaten food has decayed on the bottom and has caused the slime to form. Clean out the tank and use natural gravel and then go easy with the food.

TROPICAL QUERIES

by Jack Hems

I have a large metal tank which I should like to make into an aquarium by placing glass in the sides and a cement and sand mixture over the base. Do you think it would be a success?

I see no reason why it should not be a success if you go about the conversion properly. For instance, after cutting out the sides in readiness to take the glass, give the metal two coats of lead-based or polyurethane paint. Next, after the glasses have been firmed in on a cushion of putty and the bottom has been given its covering of cement and sand, mask all inside seams with a piping of silicone rubber sealant. Finally, before setting up the tank for fish, give the inside a good soaking in several changes of acidified (vinegar or sulphuric acid) water to kill the lime.

I have read that the Indian climbing perch

travels overland from one body of water to another in search of food or a new home. Tell me please how this fish manages to travel over the ground?

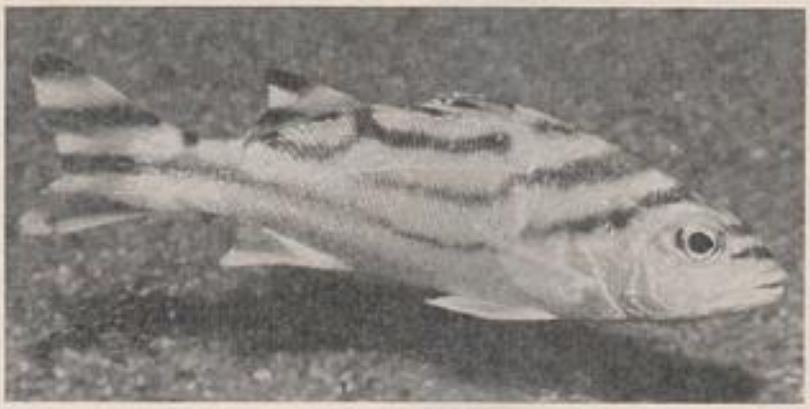
The short answer to this is that it uses its strong-rayed pectoral fins and extended gill-covers to keep it steady, and lateral movements of its tail to help it along its course. Its journeys are usually undertaken early in the morning, when the herbage is wet with dew, or during or immediately after rain.

Please suggest a few names of barbs for a colourful barb-only four foot tank.

Among the best barbs to mix together are the purple-headed barb (*Barbus nigrofasciatus*), the ember barb (*B. melanampyx*), the island or checker barb (*B. oligolepis*), the half-striped barbel (*B. semifasciolatus*), the striped barb (*B. fasciatus*), and the charming sport of either *B. sachsi* or *B. semifasciolatus* (or both), popularly known as Schubert's barb (named after the late Tom Schubert, of Camden, New Jersey, who developed it in the 1930s).

I should appreciate some information on the care and behaviour of the target fish.

I imagine you are referring to the marine fish



Therapon jarbua

(*Therapon jarbua*) which can be acclimatized (gradually) to live in freshwater. This fish flourishes best in a spacious aquarium maintained in the upper seventies (°F). Immature target fish are peaceful, but large ones are fin- and body-nippers. Therefore they should be given a tank to themselves or placed with fast-swimming fishes of fairly large size. Almost any food is taken but flesh and live-food is best.

Is the cyprinodont (*Rivulus harti*) suitable for a community tank?

R. harti is quite suitable for a community tank provided there are no very small fish present. The trouble with *R. harti* is that it has a large mouth and an appetite to match.

I have introduced a sucker catfish named *Otocinclus affinis* into my community tank, but it does not seem interested in any of the food eaten by the other fishes. In fact, all it seems interested in is clinging for what seems like hours on end to a piece of stone. Can you tell me something about its likes and dislikes?

O. affinis likes a tank well-clothed with algae and does not get on at all well in a tank without algae. In point of fact, the reason why so few of these sucker fish live more than a few months in a scrupulously clean tank is that they find insufficient algae to keep them alive. Yet algae is not the only food *O. affinis* will eat. It will also go for tiny red or white worms, live *Daphnia*, and the like. But unless you introduce such food last thing at night (just before the tank and room lights are put out) the other fishes will get it first and the otocinclus will die of slow starvation.

I have heard about a fish called a compressed cichlid. Can you please give me some information about this species?

The compressed cichlid is known to science as *Lamprologus compressiceps*. It hails from Lake Tanganyika and, as its name suggests, is very compressed or flattened from side to side. In nature the fish lives among rockwork and feeds on various aquatic larvae, crustaceans, and small fish. In captivity, it flourishes only in alkaline water.

Please give me the scientific name of the red oscar.

As the red oscar is a sport or colour mutation of the ordinary oscar, then the red oscar bears the same scientific name as the type, which is *Astronotus ocellatus*.

I have been informed that the cement used to secure the glass panels in an aquarium frame can sometimes send the pH value of a small body of water too high for the well-being of some aquarium fish. Is this true?

Certainly true if the cements have been compounded of plaster of Paris, whitening, and the like, and a large surface, taken altogether, is exposed to the water. Time and use will lessen the danger of an excessively high pH, but the best way to guard against it is to coat all seams with a silicone rubber sealant.

I have been told that a plastic aquarium is a better buy than a glass-sided aquarium because it will not break if knocked against and can be lifted with ease and safety. What is your opinion?

A plastic tank is a useful receptacle for housing water-loving amphibians and the odd pair of tropical or coldwater fish because, as you have mentioned above, there is little weight and the danger of cracking is negligible. But bear in mind that a plastic tank scratches more easily than glass and tends to become cloudy with use and increasing age.

What is the maximum length of the spiney eel called *Mastacembelus armatus*?

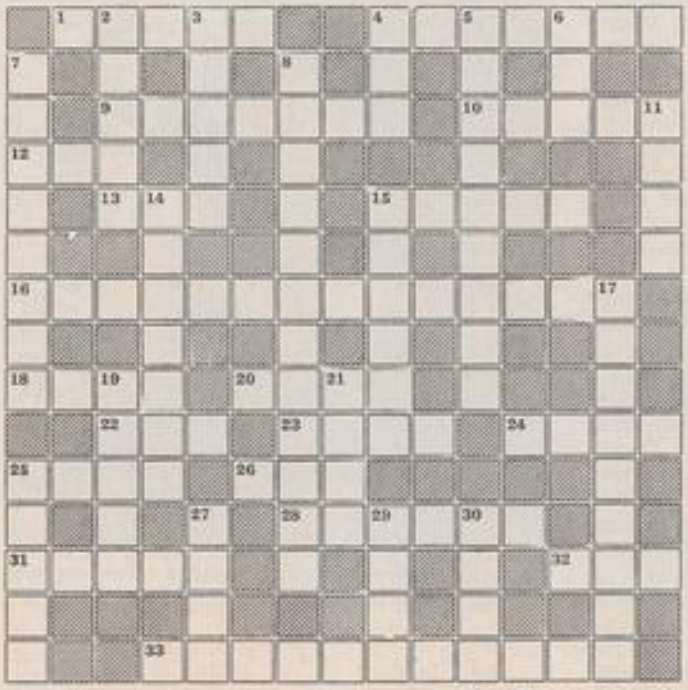
Authoritative writers tell us that this species grows to about two feet, but I have never seen one this length in a dealer's shop or at a fish show. In my own small experience with this fish, it takes an age for it to reach a foot, but this slow growth may be attributed to lack of swimming space (in the average tank) and the right sort of food.

I am interested in the common puffer fish (*Tetraodon cutcutica*). **Is it possible to breed this species in the aquarium?**

This species has been bred abroad and, according to Professor Günther Sterba, the female lays her eggs on stones, after which the male assumes responsibility for their care until the fry hatch out within the space of about eight days. The baby puffers feed on brine shrimps, infusorians and, as they increase in size, tiny snails.

The AQUARIST Crossword

Compiled by M. W. CLARKE



CLUES ACROSS

1. *Abramis brama* (5).
4. Excellent live food but for its dirty habitat (7).
9. Distance between the tee and green? (7).
10. *Barbus terrazona*, the —— barb (5).
12. Small boring instrument (3).
13. *Hyphessobrycon* ——, see 30 down (3).
15. African wild dog with a hideous call (5).
16. *Acanthodoras spinosissimus* (7, 7).
18. Maximum number of skittles which can be knocked down with one ball (4).
20. Aureomycin is a good one for 33 across (4).
22. West coast Scottish town (3).
23. Excellent air high up (4).
24. Ragged fins could well be (4).
25. Units of electrical resistance (4).
26. Common name of *Homo sapiens* (3).
28. Descriptive of 33 across (6).
31. Bird of the thrush family looking like a blackbird with a white bib (5).
32. Large tank (3).
33. It's caused by *Chondrococcus columnaris* (5, 6).

CLUES DOWN

2. Long gun (5).
3. A fish's other name (5).
4. Playful thing (3)
5. Dairy insect? (9).
6. A thick mist (3).
7. Small creatures of the sea (8).
8. Snow White's *soubriquet* (5, 7).
11. Plant's anchor (4).
14. They are found off the north of Scotland (7).
15. Married to a thermostat (6).
17. Plant required to cover a bald tank (4, 5).
19. They may be Latin or common (5).
21. Frog genus (4).
25. Enriched oxygen (5).
27. She took to the viper (4).
29. A plant's food factory (4).
30. Early morning tetra? (4).

Solution on page. 227

A CICHLID COMMUNITY AQUARIUM

Written and Illustrated by J. Dunbar

I AM SURE most aquarists, like myself, when starting out on our fascinating hobby have a community tank containing guppies, swords, neons and almost any fish which we fancy in our dealer's tanks.

It was when I was at this stage that I decided I would have a set-up containing dwarf cichlids. Having read so many conflicting stories on how these ruffians uprooted, excavated and fought, tearing each others fins to shreds, I set about my cichlid tank expecting anything to happen.

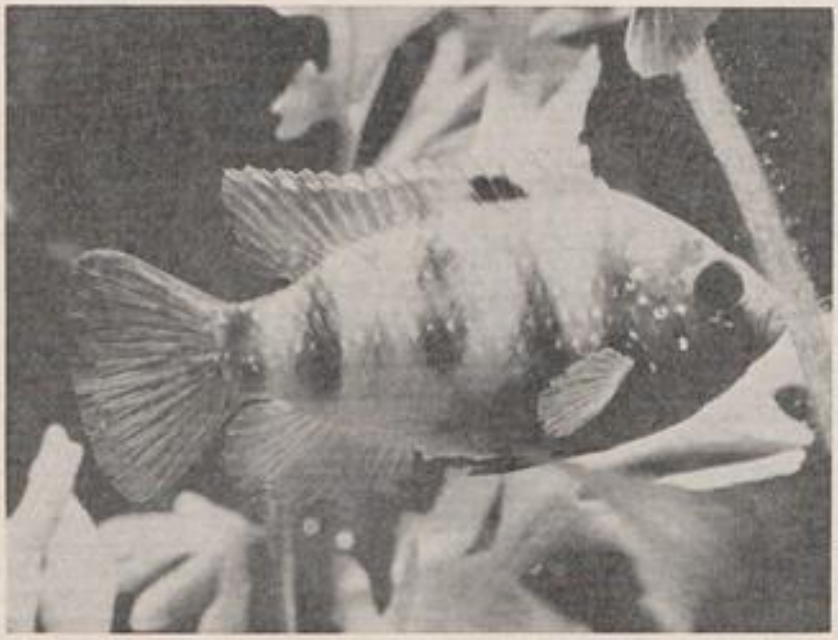
The tank was a standard 36 in. × 15 in. × 12 in., and filtration was by two undergravel filters. There was also a pair of aerator stones, air being supplied by a Rena super. Large stones were placed at either end with a rock formation in the centre which concealed the heater from view of the front glass. The tank was heavily planted with Indian fern (*Ceratopteris pteridoides*), Ambulia (*Lemnophila sessiliflora*), various Cryptocorynes and *Vallisneria*.

Now to the selection of fish. I have a particularly soft spot for *Pelmatochromis kribensis*, sometimes called the Dwarf rainbow cichlid, and rightly so as this fish when in breeding colours takes some beating. Two pairs were added; these fish almost immediately paired off, taking up residence at either end of the tank behind the corner rocks. I next added three Lake Nyasa cichlids (*Pseudotropheus tropheops*). After a few weeks one died, leaving two fish. These fish I found very interesting, having habits which I hadn't noticed in other cichlids. They would chase each other in a tight circle of about six inches in diameter, practically nose to tail. Then they would spiral up and down from water-surface to gravel. This behaviour would last for about five minutes at the end of which they would

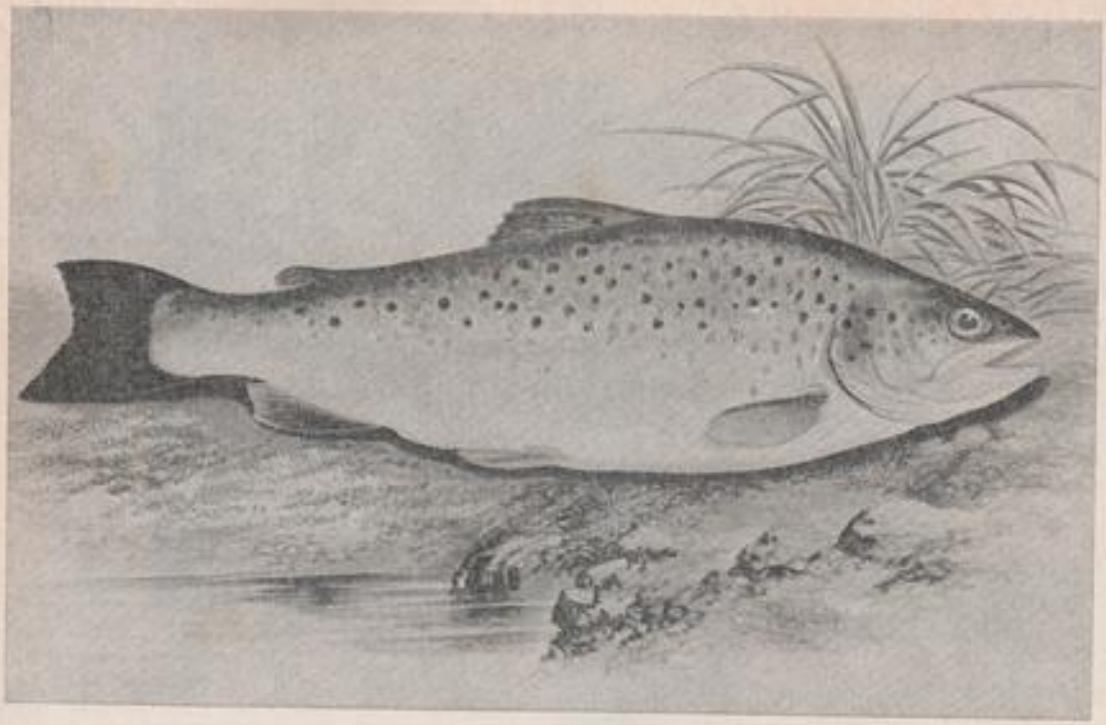
continued on page 223

Some of the heavy planting in the cichlid community tank showing *Vallisneria*, Indian fern and *Ambulia*.

Aequidens curviceps, Sheepshead cichlid



Pelmatochromis thomasi



From a coloured lithograph by A. F. Lydon from *Houghton's "British Freshwater Fishes" 1879*

British Freshwater Fishes

THE TROUT

by A. Boarder

THE TROUT is a very variable species and has been divided into several distinct ones by some writers on the subject. Whether there is any justification for these divisions is a matter of debate as it seems that Trout from varied waters differ in a few respects from others found in perhaps a faster running river. Two main species are generally acknowledged and they are the Brown trout, *Salmo trutta*; and the Rainbow trout, *Salmoirideus* or *Salmo gairdneri irideus*. Some of the popular names given to Trout found in various waters are: the Sewen, the Common River Trout; Phinock or Eastern Sea Trout; the Galway Sea Trout; the Orkney Sea Trout; the Great Lake Trout; the Gillaroo; the Welsh Black-finned Trout and the Lochleven Trout.

The Trout is a member of the Salmon family and resembles this fish somewhat in shape. Most kinds have a varied amount of spots or markings and are quite colourful. The Sea Trout is more silvery than the Brown Trout which is non-migratory. The Brown Trout can live and thrive in inland waters and many are bred for stocking lakes and reservoirs. The Rainbow Trout has been introduced into Britain and is a lovely fish but does not grow as large as the Brown Trout.

The food of the Trout resembles that of most river fishes and includes insects and their larvae, crustaceans, worms and any small fish it can catch. The Brown Trout spawns in late autumn and winter whereas the Rainbow Trout spawns in the spring. Trout are not easy to keep in aquaria and it is only possible to keep them for long periods if a goodly stream of fresh well-aerated water is pumped into the tank continuously. If anyone is keen to keep

these handsome fish it is necessary to start with very young fish so that they can become acclimatised to the conditions at an early stage and not have lived for some time under much better conditions than they could probably find in a tank.

The Trout is hand-stripped by breeders for rearing fish for stocking lakes, etc., and it does not appear to be a difficult process. They are more easily stripped than are goldfish, mainly perhaps because much larger fishes are used and they are stronger and can withstand more pressure when being stripped. One method of hand-stripping Trout is to use an empty dry bowl for the reception of the eggs. Once the eggs are obtained, the male is then stripped of the milt over the eggs and water is added. This is washed round the eggs with the tail of a fish so that the sperms are well distributed among the eggs. After a time the eggs are well washed to remove any sperms which have not fertilised an egg. This is so that they are not allowed to die and tend to pollute the water or encourage fungus to form on the eggs. The eggs are then subjected to a constant stream of water over them to keep them well oxygenated.

In the rivers where Trout lay their eggs they can take many weeks to hatch and it is not until the spring that the eggs of the Brown Trout hatch out. The tiny fry remain partially hidden in the gravel on the bottom for some time.

There are records of Trout having been caught on rod and line of up to 39½ lbs., but one of 20 lbs., is a very good specimen. They are taken by fly-fishing or by live-baiting in some waters. They may also be caught by using an earth-worm as bait. I remember accompanying my father on a fishing expedition not many miles from London, about seventy years ago. He had permission to fish in a mill pond where there were Trout, and was asked to return any that he caught. Whilst fishing for Perch with a lob worm, he caught a beautiful Trout. Did he return it to the pond or to his bag? Well, I remember sketching and colouring the fish at home later on so the Trout must have found it way into the bag instead of the pond.

A Cichlid Community Aquarium

continued from page 220

violently twitch, side by side.

Another favourite fish of mine is *Aquidens curviceps*, also known as sheep's head cichlid. A pair of these fish were added, and settled down quickly. Being rather shy fish they mainly stayed in the rear of the aquarium, usually browsing amongst the Indian fern.

So far everything was going fine, all fish behaving well, having respect for each other and not getting in each others way. The male *kribensis* would sometimes make quick dashes at each other if either entered the other's territory. There were never any actual blows struck as both fishes' fins remained intact.

I then added to the dwarf collection a pair of *Pelmatochromis thomasii*, a very quiet fish. The colouring of these fish is beautiful. When the light strikes their flanks, fluorescent scales of blue and gold glisten against their natural body colour of silvery grey. The dorsal fin is edged with golden tips and the caudal has a bright red upper edge.

I have also added a young *Pseudotropheus auratus*, often called Golden Lake Nyasa cichlid. The *auratus* with its horizontal stripes of gold and black has added a splash of colour to the tank. The last pair of fish in my collection were *Cichlasoma spilurum*. These fish have turned out to be the greediest fish I have known or kept. When the worm-feeder is full of *tubifex*, they will gorge themselves until ready to burst. Unlike other cichlids who, when full, will continue to pull worms from the feeder and drop them on to the gravel, these will continue to eat them. I bought the fish six weeks ago when barely an inch long and now they have doubled their size. The *spilierum* has an overall colouring of blue with dark blue-black vertical stripes. The dorsal has light blue flashes about one-third of the way along separated with darker blue rays.

I have had the collection going now six months. The tank is still flourishing, all plants intact. The *kribensis* have been responsible for some minor excavations behind the large stones, but nothing to worry about. Perhaps I have been lucky with my fish. There is some sparring, especially when the *kribensis* are showing interest in each other, but if the other inmates keep to their own patch no damage is done. I think that the fact that there are plenty of plants in the tank gives the fish a sense of security. knowing that there are plenty of hiding places at hand.

The accompanying photographs will illustrate some of the fish and the heavy planting which I have in my cichlid community aquarium. For anyone who has thought of setting up a cichlid community tank, but were afraid of coming home to a wrecked tank, the above account will, I hope, drown their fears. From my own experiences and enjoyment of watching my fish I wouldn't hesitate to recommend such a community aquarium.

A BACKGROUND FOR A POND

by Jack Hems

AN UGLY FENCE or buildings in the near background do nothing to add to the attractions of a garden pond. Yet such eyesores are easily hidden if tall uprights (pergola poles) are fixed in the ground and used as supports for self-clinging climbers. The tops of the poles should be linked across the tops with a rust-defying wire or a thick, preservative-treated rope.

Species and hybrids of clematis, honeysuckle (particularly the wonderfully scented *Lonicera japonica* var. *halliana*) and the Russian vine (*Polygonum baldschuanicum*) are among the climbers that provide maximum cover in the shortest possible time. (*Clematis tangutica* will make about ten feet of growth in a single season while the Russian vine will do even better.) But remember that most, if not all, clematis succeed best with their power portions in the shade. Hence it is wise to plant them on the sunless side of the uprights or shield their stems near the ground with lavender or some other low-growing bush.

Even though the above climbers drop their leaves (excepting the Japanese lonicera, which is almost evergreen) with the onset of winter, their tangle of brown stems affords an excellent barrier against a dismal view. Further, in the interests of wild life conservation, the tangle of stems provides snug nesting and roosting places for various of our garden birds.

In front of such a screen a small tree or large plant having associations with water will not be out of place and certainly add to the beauty of the scene. Manageable willows (and there are many) pruned back hard each Spring are pleasant to behold later in the year but few, if any, are so distinctive as the twisted willow (*Salix matsudana* var. *tortuosa*). This interesting tree is seen at its best after its narrow grass-green leaves have fallen and its branches, twisted as a corkscrew, or gimlet, are seen against the backdrop of the sky.

If you would like a splotch of red at the end of the garden to brighten winter's gloom, then the violet willow (*S. daphnoides*) will oblige unfailingly if its branches are shortened in February or March. Even

Photo by Diana Perkins

Young specimen of *Gunnera manicata* with Corgi for size comparison

Twisted Willow *(Salix matsudana* var. *tortuosa)*

more eye-catching is the bark of the Siberian dogwood known as *Cornus alba*. For after an early cutting back, the stems of the new season's growth will stand up sealing-wax red. There is a yellow-barked dogwood that is worthy of every keen gardener's attention. It is listed as *C. stolonifera* var. *flaviramea*. The type hailed originally from the northern United States. These dogwoods bear a profusion of elongated oval leaves and summer flowers of snowy to creamy white. They are followed by greyish berries. Dogwoods flourish best in habitually moist ground.

Of the large growing plants to afford a summer screen, the most spectacular, perhaps, is *Gunnera manicata*. This native of South American swamps should do well in any sheltered position in the more climatically favoured parts of the country. Its roots should be spread in well-dug soil enriched with plenty of rotted manure, leaf mould or properly made garden compost. *G. manicata*, however, is not suitable for a small garden plot. The spiny leaf-stems can reach about eight feet high and the massive rhubard-like leaves may exceed nine feet across. When the foliage of this plant dies down in the autumn straw or leafy debris should be heaped several inches thick over the crown to protect it from the ravages of frost.

Among the more conventional plants of character is *Ligularia clivorum*. This plant barely survives if its

continued on page 227

From a Naturalist's Notebook

by Eric Hardy

SEXING AND BREEDING the primitive, fringe-finned birchir, a tropical Nile fish related distantly to the coelacanths and almost sole survivor from Devonian and Carboniferous ancestors, has been brought a stage nearer from observations in aquaria of the use of the anal fin for copulation. The difference in size of the sexual organs, with the minute testes and sperm of the male birchir, had always been a problem. M. J. Holden, now at the Lowestoft fisheries laboratory, and J. Armoult, have shown that after 6 weeks pre-spawning display in aquaria, *Polypterus birchir* and *P. senegalensis* from the River Niger, and the closely-related reed-fish *Calamoichthys calabaricus* of Old Calabar, show the anal fin, normally narrow and pointed, to have become wider and rounded. This is erected as a cup-shaped organ for copulation and internal fertilisation. In *senegalensis* the male swims alongside the female with its anal fin folded towards the vent of the female, and it fertilises her eggs as they are laid.

This method conserves the small amount of milt produced by the male's minute testes.

I was surprised to see Alan Newton's new *Flora of Cheshire* quote such a long list of aquatics as having increased since de Tabley compiled the previous *Flora* in 1899. I agree over floating water-plantain, but more records of autumnal starwort may be due to modern transport getting people about more, for the late Lord de Tabley was very limited in his field-experience, compiling most of his work from others. This probably applies also to the perfoliate and pectinate pondweeds; but my experience of water plants since the 1920s when I first went plant-hunting in Cheshire with the late Dr. C. T. Green, author of a much earlier *Flora* would not include arrowhead, sweetflag, flowering rush or hornwort among increasing plants, though they still thrive in places. We have lost too many ponds, streams and ditches.

It is a pity that Cheshire Community Council, who published the new Flora, didn't form a democratically representative edictorial committee of all active societies and long-experienced field-workers, for its very friendly author admitted to me his: "relatively recent arrival in the county." It would not then have listed "extinct" some plants of which we have modern records, like marsh-St. Johnswort and slender sedge in the Delamere area. Additions would have been available to under-recorded plants like lesser bladderwort (Oakmere) and water-purslane (near Frankby).

Half the book is devoted to the ecology of plant-distribution, and to maps. It bridges the gap since 1899. One hopes that it inspires better liaison among field-workers in future, Cestrian or Lancastrian, for Liverpool, Warrington and Manchester have long been major stepping stones for studying the Cheshire flora, despite county bodies who wished to keep it a closed shop. The distribution of most of the plants is referred to only in broad, regional areas, though it pin-points some of the rarer ferns whose localities had been on our secret list, like marshfern on the margin of Wynbunbury Moss and two southern meres. It brings some interesting attention to the eastern canals which de Tabley neglected, like the Peak Forest and Macclesfield canals (unbranched bur-reed, the Potamogetons lucens, obtusifolius, compressus, alpina, trichoides, and floating water-plantain and Lagarosiphon major, the latter at Hyde). It also covers the eastern reservoirs better than did de Tabley, like Disley, Langley and Bosley (water-purslane, etc).

"People interested in plants who have continuity in the area are scarce," the author wrote to me when he began his book. He also agreed that: "The B.S.B.I. atlas, at least as far as Cheshire is concerned, presents an inadequate account of the facts."

It is unfortunate that a conference supposed to improve recording in Lancashire and Cheshire, made little or no effort to be democratically organised, or even fully representative. Without prior consultation with the biggest societies or recorders in the area, to find the most convenient date, no announcement was made until Easter. Then the county trusts announced, privately, a week-end in Liverpool Museum, on a take it or leave it basis. Many of us were already booked on holiday. "It's essential that your association, the biggest in the area, should be represented there," started Dr. Perring of the Nature Conservancy Biological Records Centre to me earlier in the year, when he was astonished that no advanced contacts had been made. We weren't represented, simply because we received no invitation. No wonder the recording of plants, fishes, birds, mammals and most other fauna and flora in the North-west continues to be incomplete and often misleading. Some of the best organised and most

democratically-run national recording conferences are those the British Trust for Ornithology holds at Swanwick conference centre. Scottish ornithologists also manage their affairs on equally admirable democratic lines, chiefly because they do not suffer from a proliferation of overlapping and competing societies and county trusts.

I have mentioned before that it is illegal to possess "European" carp in South Australia, without licence. The fish have spread through the River Murray and the lakes systems and seriously threaten the future of native species. That was the fear British fish-biologists expressed to me over the Jewish carp farming at Lake Huleh and Galilee, during the times of our Mandate in Palestine. But events have disproved their fears. The native *Tilapia* are sufficiently numerous to appear alongside carp on the menu at Tiberian restaurants.

Incidentally, among important recent publications of the Israel Programme for Scientific Translations is an English edition of N. N. Disler's 332 page Russian book on the *Lateral Line Sense Organs and their Importance in Fish Behaviour* which traces their structure from embryonic and larval stages to maturity, and relates the author's experiments and observations on fish behaviour of larvae and fingerlings. Another is V. R. Protasov's 180 page work on *Vision and Near Orientation of Fish*, another richly illustrated original work on behaviour. Previous notable translations of theirs include manuals on the freshwater fish and molluscs of the U.S.S.R.; Romanov's 400 page Annotated Bibliography of Far Eastern Aquatic Fauna & Flora, 1923-56; the Caddis-flies (Trichoptera), Sea Urchins, Starfish, Cyclopoids, Isopoda, etc., sections of the mammoth Fauna of the U.S.S.R.; Parasites & Diseases of Freshwater Fish & their Biological Control, and a Key to Parasites of Freshwater Fish of the U.S.S.R.

California has arranged to send another 100,000 Lake Tahoe "signal" crayfish (*Astacus*) to Finland, to acclimatise them where fungus disease is rampant among native crayfish. This follows successful introductions into Swedish lakes during 1967-70, where the California species proved highly resistant to the infection. The disease nearly wiped out the European crayfish from Sweden. Will the American crayfish finish it off?

Our Lancashire sea-fisheries committee's laboratory at Preston (shortly to be removed to Lancaster University) recently received its largest three-bearded rockling, measuring 17 inches and weighing 1½ lb., caught in a whitebait-net near Idridge Skear in Morecambe Bay. But is wasn't the largest from this side of the Irish Sea littoral, for an old Bangor (North Wales) specimen was 19 inches long. The laboratory also received its largest oyster shell, measuring 7 inches by 6 inches and full of flesh—trawled in the Bass Pool by Barrow in Furness' Piel Island. In 1956, I was shown a very large specimen with 53 growth-rings, which a fellow member of the committee trawled off Morfa Nevin, North Wales.

Finally, a footnote on inducing shrimps to spawn in captivity, American style. Miami University biologists remove the eyestalks of their aquarium's female pink shrimps, *Penaeus duorarum*, to mature them quickly. These eyestalks of Decapod crustaceans contain glands which secrete ovary-inhibiting hormones. Ovaries are induced to contain ripe eggs two or three weeks after their removal.

A BACKGROUND FOR A POND

continued from page 225

roots are not kept wet during a drought, but planted in moisture-retaining soil (a mixture of garden compost and peat) it will produce handsome foliage and flowers. The rounded leaves are dinner-plate size and are borne soldierly erect on three- to four-foot stems. The flowers, that first appear about August and go on until the frosts set in, are like big orange daisies. There is a form of *L. clivorum* with reddish brown leaves. To cover winter-bared margins of a pond, nothing could be better than evergreen bergenias. The bergenia called Ballawley Hybrid is one of the best with apple-green leaves that turn liver-red in the winter. Its erect stems bear clusters of crimsonish flowers from February to early May. Apart from masking unattractive stonework, the leaves of bergenias give good cover for frogs and toads. Bergenias thrive best when they are given protection from the full force of cold winds.

Crossword Solution

THE EUROPEAN CATFISH

by J. C. Thiéfaine

No fish has ever been subject to so much exaggeration, superstition and incredible stories as *Silurus glanis* the European catfish. It is the biggest freshwater fish. Only some *Acipenseridae* (Sturgeon family) as the common sturgeon (*Acipenser sturio*), the white sturgeon (*A. transmontanus*) and the hausen (*Huso huso*) can reach larger dimensions than our European catfish but they are really migrating fishes which live most of the time in the sea and swim up the rivers at breeding time. *Silurus glanis* is really a freshwater fish.

Its area extends from western Europe (the Rhine) to middle Asia (Sir-Daria and Amu-Daria). There is no *Silurus* in Norway, northern Sweden and northern Finland, in Great Britain, France, the Iberian peninsula; Italy and in the Balkans. Individuals caught in the British Isles are therefore descendants from imported fish. I suppose they never reach considerable dimensions as the specimens living in central and eastern Europe.

In France smaller fish have been reported in the Doubs. Certainly they have come there from the Rhine across the canal between the two rivers and other water connections. From there they can occur in the Rhone (very seldom).

In the Netherlands specimens living at the Artis Aquarium in Amsterdam have been caught in the Haarlemmermeer (Lake of Haarlem). As with the American catfish (*Ameiurus nebulosus*), the colour of *Silurus* can vary according to the district where the fish is living. These ones, in Artis, are almost entirely and uniformly black, with a lighter belly. The biggest is about 120 cm. in length. In the Wilhelma Aquarium in Stuttgart (West Germany) a fish can be seen with a greyish-brown marbled colour pattern. The Haarlemmermeer is now what they call a polder and only some canals are remaining. In these waters, some *Silurus* are reported now and then, but rather seldom. Some fish are also living in the Westeinder Plas, a lake between Amsterdam and Utrecht.

In Sweden, *Silurus glanis* does not exceed 1·80 m. in length and a weight of 130 kg. An albino form exists, as I noted from a photograph in the Swedish periodical "Akvariet".

The biggest fish I saw in my life lives at the new aquarium in Cologne. It is about 2m. in length, with a bluish-grey spotted colour pattern.

The fish can be found in the Rhine and its tributaries but the biggest ones are living in the Danube and the large rivers of eastern Europe, Dnieper, Volga, etc., 3 m. long individuals, with a weight of up to 300 kg. are not rare and in some eastern literature, fishes of 5 m. and 500 kg. have already been mentioned (maybe with some Slavonic exaggeration).

It is understandable that such large fish are subject to dreadful stories and legends (we know the same of the Piranhas). In some countries, they were considered as devils in old times; in other places as gods. Such gigantic fish feed on many materials, carrion, fish, amphibians, and if they can catch them, on small rodents and wild fowl. Specimens have been caught with a cat or a dog in their stomach! In some Russian books, they are reported to be dangerous to bathing children. Entire schools of young fishes are caught by suddenly opening the large mouth. The water streams in it and sweeps the fry along.

It would be unnecessary to say that *Silurus glanis* is no fish for the home aquarium as it grows very quickly to a gigantic beast. One year old fishes reach 20 cm., four years old 60 cm. and 10 years 1 metre with a weight of about 8 kg. We may conclude that the fish can live a long time. Unfortunately, I could not find any mention of longevity in the literature.

Meanwhile, young specimens can be kept in very large aquaria, with special care and conditions as the fish needs much food. The best method is to breed some cyprinids on a rather large scale to feed our catfish with. But, inevitably, after some time, we must get rid of it. Personally, I can advise you that a European catfish is suitable only for public aquaria!

Like most of the siluroids, *Silurus glanis* has nocturnal habits. During the day it remains hidden in a hole or among roots near the banks. It can live also in holes in the deepest part of the water. These fish live sedentarily and can dwell at the same place for more than 10 years. They enter shallow water at night to hunt for fish and other prey.

Silurus glanis is sexually mature when 4-5 years old. The breeding season is April to June, when the water temperature reaches about 20°C. and more. The fish moves inshore to places where the vegetation is very thick. It is monogamous, i.e., only one male and one female will breed together. It builds a primitive nest of plants where the eggs are laid (about 100,000). Incubation requires about three days during which the male remains by the nest and guards the eggs. The colour is orange (caviar is not only made of sturgeon roe but also of *Silurus* Roe). The young are entirely black and they resemble tadpoles.

Anatomically, *Silurus* differs from the American catfish in the six barbels (eight in *Ameurus*), i.e., two long ones on the upper jaw which can reach beyond the pectorals and four shorter barbels on the under jaw. The under jaw is somewhat longer than the upper. Both are fitted with many small but sharp teeth. The fish has only one dorsal and no adipose fin as the American catfish. The caudal is not incurved, rather round and it seems to be connected with the very long anal fin. Here is the fin formula: D 1/4 A 90-92 P 1/14-17 V 11-13. The skin is uncovered with scales and slimy. The head is very large and the eyes are small. The tail peduncle includes more than the half of the whole body length. *Silurus* belongs to the family *Siluridae* which contains the genera *Kryptopterus*, *Ompok*, *Silurichthys* and *Silurodes*.

INFUSORIA

by B. Fry

INFUSORIA IS A well-worn word in the vocabulary of the aquarist. It embraces (loosely) a wide variety of single-celled forms of life (protozoa) that live in water (but can become airborne as encysted cells), feed on bacteria, multiply by division and, more importantly, form the first food of baby fishes.

In some infusorians division takes place about every hour. Hence their astronomical numbers in certain natural waters. Locomotion is achieved by means of minute waving filaments (protoplasmic projections) growing out of the body. These filaments called cilia function after the manner of oars and not only enable the infusorians to move about but sweep their food into swallowable distance.

Sufficient infusoria to get the fry of most of our aquarium fishes off to a flying start may be cultivated in 2 lb. jars of matured aquarium water (or strained pond water) seeded with such vegetable refuse as a well-ripened banana skin, a wilted leaf of lettuce, or some soggy pea-pods. It is important that the jars should be kept at a temperature in the sixties or seventies (°F) and out of direct sunlight.

There is an art in preparing the jars which comes only with experience. Rotting vegetation, the very essence of success, must not be introduced too lavishly or else the result will be great turbidity of the water and a nauseous smell. Clearly, what is needed in the way of decaying vegetation is enough and no more to create bacterial activity. This is denoted in its early stages by slight clouding of the water and a faintly gaseous smell. In short, then, water slightly "off" but not loathsome. Then, as the infusorians multiply at the expense of the bacteria, the water will clear and become almost odourless. It is possible to detect the presence of infusoria without the aid of a lens by holding a loaded jar up to the light: a good culture of organisms will show up as a slow-moving cloud of greyish-white specks or dust.

The minute organisms can be removed with an eye-dropper or, better still, siphoned direct from a non-loathsome jar into the aquarium itself. The siphon tube must be fitted with a device to regulate the frequency of the drops. As a rule, a few hundred fry will get through a jar of infusoria in a day. The jars need setting up a few days' before initiating a breeding programme.

The feeding of infusoria to fry should continue for about nine days, after which larger food can be given. The fry of some fishes as, for example, the dwarf gourami (*Colisa lalia*), can manage only the smallest organisms available. These are most likely to be obtained from young (new) cultures or from single species' jars. Pure cultures of the minutest species of protozoa may be purchased from certain firms specialising in biological supplies or, alternatively, they can be isolated from a jar of mixed species and bred with meticulous care.

Junior Aquarist

THE FROG FROM NEXT DOOR

Written and Illustrated by Derek Rutherford (aged 13 years)

The writer's pond of plastic-sheet construction.

RECENTLY I built a pond in my garden. It is very small and shallow and it hasn't a lot of surrounding plant-life. I was going to have only fish in my pond and in two months I collected fifteen, a mixture of some goldfish and some bleak. In the meantime, one of my neighbours had added to his collection of edible frogs (*Rana esculenta*). His pond would seem just right for them with plenty of overgrowth and plants for them to hide in around the edges. He has had a collection of edible frogs for several years and had hoped that they would breed. But, funnily enough, one of his male frogs came over into my little pond and started to croak. I came home from school the following day and went to feed my fish. It was then that I saw two edible frogs and they were clasping. The female was brown and had a green stripe along the back. The male was a bright green with a lighter stripe on the back.

I went to see them the next day and the female frog had left and gone back to my neighbour's pond but the male had stayed and I was very surprised to find three lots of spawn. This was on the 5th July. I took the spawn out of the pond, thinking my fish would eat it, and put it into a water-filled aquarium with some of my pond weed for them to feed on. The spawn was quite different from that of the common frog being much smaller in size. I waited for them to hatch out which they did in a few days and I then put them into a smaller aquarium so that I could see them better. The tadpoles are very much smaller than common frog tadpoles. I have given them plenty of weed to feed on but will give them some raw meat or minced meat when they grow bigger.

On the 13th July I found three more batches of spawn but no sign of the female which my neighbour said was back in his pond.

Since the spawning, the male frog has been seen, on and off, in my pond and in my neighbour's pond and it seems that he leaves one pond when it is in shadow and goes to the other to find the sunshine. Another male frog has left my neighbour's pond and come over to mine and both of them croak now and again during the day and night.

THE TINFOIL BARB

by Jack Hems

This handsomely proportioned and attractively coloured barb is native to the freshwaters of Thailand and Indonesia. Immature (small) fish are typically aquarium-barb-like in outline, but mature fish are almost, if not quite, tall diamond shaped and considerably compressed for their size. A well-grown tinfoil barb may exceed a foot in length.

Barbus schwanenfeldi—to give this species its formal name—was introduced into this country by Derek McInerny, founder of the famous McLynn's Aquarium, in 1955. But according to Professor Günther Sterba (*Freshwater Fishes of the World*), its availability in Germany dates from 1951. It was described for science by the Dutch ichthyologist, P. Bleeker, in the second half of the nineteenth century, in 1853 to be precise.

In coloration, *B. schwanenfeldi* is leaden green on the back shading down to silver overcast with yellow on the sides. The underparts are pearly white. Viewed before a strong light, the scales sparkle, tinsel-like. The fins are yellowish to red. The top portion and anterior rays of the dorsal fin are marked with black as, also, are the upper and lower margins of the well-spaced caudal lobes. There are small barbels on the mouth. The iris of the large eye is silver to gold below and dark metallic red above. The pupil is velvety black.

The species is an active one and swims at all levels in the water. It is a good jumper. It may be placed with other fishes in a community tank but may chevvy them around too much if they are sluggish in their movements or much smaller in build. Again, when food is introduced, it will push the timid or less assertive ones out of the way. Uncooked porage oats, lean beef, and the like, can be used to supplement a basic diet of dried and live food. What is important, also, is a regular supply of suitable greenstuff; for in the natural state Schwanenfeld's barb eats algae and other vegetable matter as well as fry and aquatic insects and their larvae. Duckweed, finely chopped lettuce or small portions of cooked cabbage, kale or spinach will fill this need.

Clearly, a tank for *B. schwanenfeldi* must be large. Next, it should be furnished with lime-free rockwork (plants are out of the question except for very young fish) to afford hiding places and decoration. The chemistry of the water is of no great importance. Seemingly, matured tap-water, that is neither markedly hard nor alkaline, is as good as any. And as for temperature, a range of from about 72°F (22°C) to 78°F (26°C) is perfectly satisfactory.

Given adequate swimming space in clean, well-aerated water and a well-balanced and generous diet, a tinfoil barb can be expected to reach a length of five or six inches within the space of a year. Thenceforward, growth is not so fast.

If *B. schwanenfeldi* has spawned in captivity details of the procedure have escaped my notice. Further, up to the present writing no one has told us (in print) how to tell the sexes apart. Which leaves us to assume that, in well-grown specimens of similar size, the fat ones with yellow/orange fins are females and the lean ones with reddish fins are males. I guess it is as simple as that.

OUR FIVE NATIVE DUCKWEEDS

by S. M. H. Loquens

THE GENUS *Lemna*, comprising the duckweeds, consists of about twenty-two species scattered throughout the world, of which five are native to the British Isles. They are all characteristic in that they are much reduced, possessing only a few, small, rotund leaves, roughly at right angles to one another. All of the species except one possess one or more small rootlets which hang from beneath the plant.

The duckweeds will flower only rarely; the flower, when it appears, emerging from a small fissure at the edge of the leaf. The chief mode of reproduction is therefore by vegetative division which, under ideal conditions, is extremely rapid. It is for this reason that they are frequently used in plant cell studies (cytology), as results can be obtained relatively quickly in comparison with many plants. Of the five native species, four are true duckweeds: *L. minor*, *L. gibba*, *L. polyrrhiza* and *L. trisulca*; while the fifth, *L. arrhiza*, also known as *Wolffia arrhiza*, is essentially a reduced form. It is for this reason that the latter is sometimes referred to as the smallest flowering plant.

L. minor, the common or lesser duckweed, bears a single rootlet and is the most widely distributed of the species. There can hardly be a pond or ditch that is not populated by this plant during the summer months. *L. trisulca*, the ivy-leaved duckweed is also well distributed, except for the most northern regions of Scotland.

Unlike the other species, it tends to float just beneath the surface rather than upon it. It is also thinner than the others, allowing more light to penetrate its leaves and reach plants below. In appearance it is probably the most appealing of the British species. *L. polyrrhiza*, the many rooted duckweed, is the largest of the native species and fairly well scattered, but by no means common. Where it is found, however, it grows as profusely as the commoner species, rapidly covering the surface with its green mantle. Occasionally the leaves of *L. polyrrhiza* are to be found with a purple coloration to their underside. This colour generally becomes more intense towards autumn and at such times the plant could almost be taken for a different species. *L. gibba*, the gibbous duckweed, is similar in appearance to *L. minor*, but bears only one rootlet to each leaf. It is also a little larger and has a characteristic mass of spongy tissue below each leaf. Unlike the preceding species it is rather localised being confined to specific regions. The last of the duckweeds and generally looked upon as the odd one out, is *L. arrhiza*, the rootless duckweed. This plant is little more than a small green disc and extremely localised, being found only in a few places in the southern counties of England. As a plant for the aquarium it really has little use, being even more reduced than the other species. As a botanical curio, however, it is worth giving it a few spare inches of surface space.

There can be few who have not at some time in the course of their fishkeeping, come across at least one of the above-mentioned species. Although they may be a more familiar sight upon "pea green" stagnant waters such as is found in ponds and ditches, the duckweeds may also be encountered upon the still water at the edges of canals or in the quiet backwaters of our slower moving rivers. It is probably in one of these settings, that as a youngster after "tiddlers," or as an ardent *daphnia* hunter, the aquarist had his first encounter with them. When one remembers how

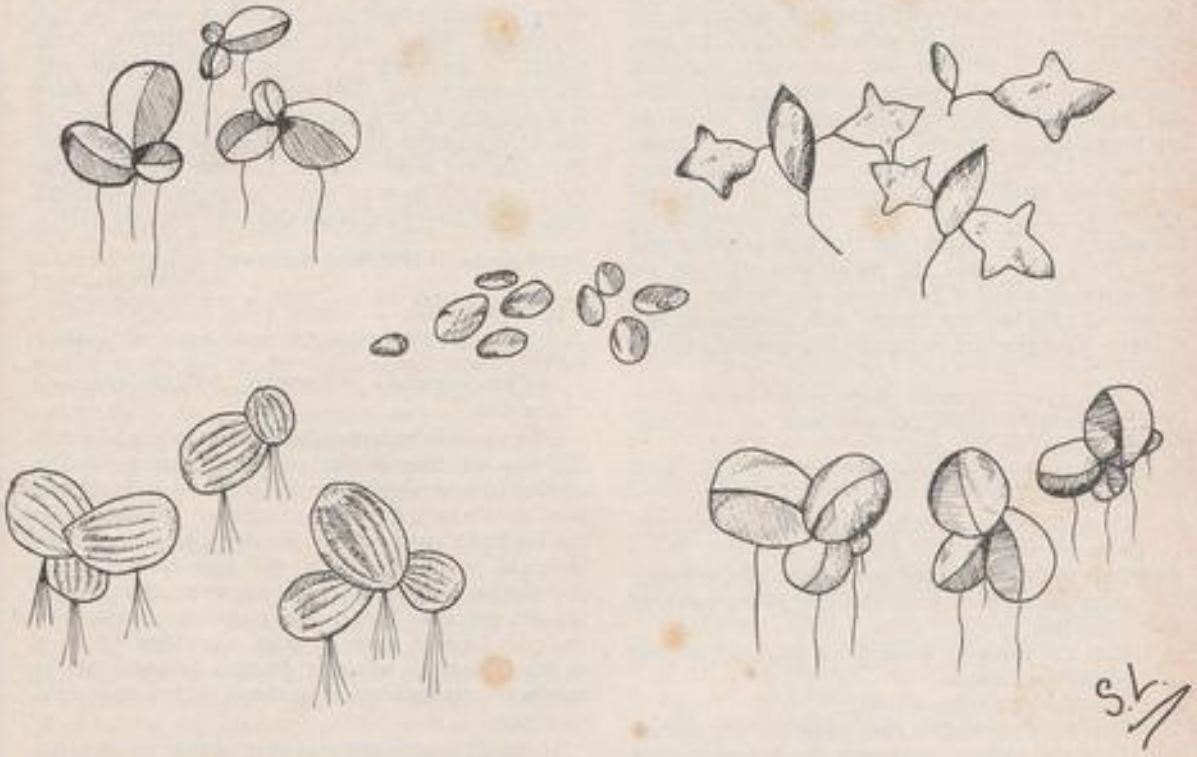
easily these plants stuck to ones arms or fishing net, one can understand just how easy it is to introduce them into the aquarium.

One of the most common ways that they are introduced, is via newly purchased plants or with live foods taken from sources such as those mentioned. It is wise to ensure that live food is free of duckweed, as there is a real danger that pests will be introduced with it. This risk is, in all actuallity, probably not much higher than that run by feeding live food in the first place. In spite of this it is still a point worth remembering, as any pest introduced is likely to be of an adhering type as opposed to a free swimming one, e.g., leeches, planaria and hydra.

Once introduced, duckweeds can be difficult to eradicate owing to their small size and rapid reproduction. It will be found that they will quickly cover the surface of an aquarium or pool, especially if it receives large amounts of light. Regular removal of them from the surface is therefore advised, as they can seriously reduce the amount of light reaching plants below, with detrimental results. If shade loving plants, such as certain species of *cryptocoryne* or *aponogeton* are present, the reduction of light can be advantageous. It may, however, still be found necessary to at least occasionally remove some, or they will literally choke the surface.

The simplest way to remove them is by scooping them from the surface with a large net. Care should be taken, however, as small fish are all too often swimming just below the surface and may be inadvertantly removed along with the duckweed. Complete removal by this method is not always possible, and it may be necessary to revert to ones fingers or a small clean brush to rid the aquarium of the last plant. In spite of this, duckweed may reappear as if by magic, a week or two later. This appearance often follows routine topping up of aquaria, when plants temporarily stranded on the glass sides by evaporating water, are refloated.

If the aquarist is in possession of any of the large species of barbs, livebearers or coldwater carp family, including goldfish, the surplus duckweed can conveniently be fed to them. Such species relish greenfood in their diet and will avidly devour these tiny plants. It will quickly be realised, that one could hardly hope to find a cheaper or more readily obtainable greenfood, than our British duckweeds. The usefulness of these plants in feeding fish such as those mentioned, should therefore not be overlooked.



Top (*left*) *L. minor* (*right*) *L. trisulca* **Centre** *L. arrhiza* **Bottom** (*left*) *L. polyrhiza* (*right*) *L. gibba*

A SIMPLE CONDUCTIVITY METER

by R. H. Cooke

BEFORE I even start to write I can hear the cry of the experts, "It will never be accurate without the conventional cell". Perhaps they are right, but that cannot stop us from making a simple gadget which can be of service to us all and providing we all do the same things we will all arrive at very similar answers. Let us pretend that we wish to arrive at a National Standard of Conductivity of Water by Aquarists or NSCWA. The above sentence is intended as a joke on my part but keep in mind that what the public wants, the public gets. Let us set out a standard set of conditions so that any of us communicating in the future will understand the others. Therefore let us fix the following conditions of test:

1. The experts measure their water conductivity in MICROMHOS per cm and we will stay with them on that one.
2. That the water pH shall be 7·0-7·4, a usual value of tap-water.
3. That the probes shall be placed 2 mm. under the water surface.
4. That the area of probe metal in contact with the water be approximately the size of the point of a ball pen.
5. That the indicator meter has a full scale reading of 500 microAmps.
6. That the battery be 9 volts.
7. That full scale reading shall equal 500 micromhos.
8. That the calibrating resistor be chosen to give full scale reading when the probes are placed 1 cm. apart 2 mm. below the surface of a 500 mL beaker filled with tap-water containing 240 ppm water with a pH of 7·2 true conductivity 500 micromhos.

Now if you all follow that I shall be well pleased because I have a 500 mL beaker and my tapwater is frequently 240 ppm at 7·2 pH.

Having said that, I have a nasty feeling that someone will write and say "Send me some water to calibrate my conductivity meter." Well it seems to be one way of getting into business.

First, let me explain as best I can, queer units like MICROMHOS. The units of resistance are ohms. As conductive impurities are dissolved into the water, the resistance goes down, so low resistance water is impure and high resistance water has less impurities. Water which measures 100,000 ohms would be good water. These units are large and inconvenient to use. However, the resistance of water is frequently in large numbers of ohms. Because of the inconvenience of large fractional numbers, we introduce the word "micro" to make matters easier for ourselves. The word "micro" refers to one-millionth part. If we invert the word OHM it becomes MHO, and if we invert 100,000 it becomes $\frac{1}{100,000.}$ Now, if we multiply this by one million we get micromhos $\frac{1}{100,000} \times 1,000,000 = 10$ micromhos. Therefore 1 million ohms = 1 micromho, 500,000 ohms = 2 micromhos.

Ohms refer to resistance, mhos refer to conductivity. We can see that as the resistance goes down the conductivity or availability for water to pass current goes up. Perhaps this is an insufficient description for the reader to learn much. However, it seems to take some of the magic from the expression. In all probability, outside biological interests, more people are interested in how much electrical current they can pass through water in units convenient for them to manipulate in whatever formula is applicable or maybe to cater for linear scale shapes in their measuring equipment.

It should be remembered that unlike the chemical process of hardness measurements, the conductivity meter will integrate the measurement of hardness with pH. This can be advantageous after you become aware of the hardness consistency of your water supply, especially when such supplies are obtained from demineralizers producing known quantities of dissolved solids which may be independent of the quality of water at the input of such demineralizers.

To manufacture the probes for this device, find two ball-point pens and dismantle them. The BIC transparent type with a blue plastic end cap is fairly easy to work on. Drill the blue plastic caps to accommodate the flexible connecting wires which will act as grommets and prevent breakage at the end of the probes. Remove the plastic tube con-

taining the ink and throw it away having first removed the tip.

The tip is assembled in two parts: (1) a little metal part which is a push fit into (2) a plastic shroud. The metal part must be washed thoroughly in methylated spirit until every trace of ink has been removed; probing with a sharpened matchstick helps.

Next you must solder one of the pair of conductors to this very small metal tip, having first passed it through the blue grommet and the pen handle. If your soldering ability is poor, talk nicely to a radio or television engineer and recruit his help. He will be equipped with a suitable small soldering iron and he will have plenty of experience with such work. The solder should cover the hole in the tip to prevent water from entering the probes. A minute amount of adhesive can be placed round the plastic parts to prevent water from entering in that region.

Both probes must be similarly connected and the two probes bound together with tape. The inside circumference of the metal tips should be fixed at 1 cm. apart.

One wire from your probes is connected to the negative terminal of your 9 volt battery, the other wire is connected to the calibrating resistor. The battery for preference should be type PP4 which is cylindrical in shape and can be fixed to one terminal of the meter with an insulated capacitor clip of the appropriate size. As the consumption from the battery is very low (max. 500 microAmps), it will last a very long time.

Connect the positive terminal of the battery to the positive terminal of the meter with a piece of insulated wire. If you cannot obtain snap clips for the battery, you can solder the wire to the battery terminal. However, do not solder the other end of the wire directly onto the meter terminals as this will prevent you from removing the nut owing to filling of the threads with solder, or it may damage the meter. Use a proper solder tag at this end. Any D.C. 500 microAmp meter will be suitable but I recommend you obtain an ex-Government type such as is used in the old Army wireless set No. 19, thus bringing the cost down to minimum. Other ex-Army wireless set meters will probably be suitable. Try meters from No. 18 or No. 22 sets. I think they are all about 500 microAmps full scale deflection. Shopping in the Edgware Road should provide a starting point or probably mail order for those living distant from this area.

Purchase a 20,000 to 25,000 ohms potentiometer for your calibrating resistor. I used a fixed resistor in my experimental model and have never bothered to change it. However, a fixed resistor is less expensive but rather tedious to calibrate requiring other resistors in series and/or in parallel to arrive at the required calibration. Unless you are lucky, the cost of the fixed resistors used equals that of an ex-Government potentiometer.

Wind the knob or slot of the potentiometer fully anti-clockwise. Using the centre tag of the potentiometer as one connection, choose one of the two remaining tags which includes the maximum resistance of the potentiometer, i.e., the one on the left-hand side looking down the spindle when the tags are at the top. One wire from the probe should be connected to one of these potentiometer tags as previously explained and the other tag chosen on the potentiometer should be connected to the negative meter terminal tag. The polarity at this point is not important.

To calibrate the meter, place the probes in the beaker as explained (see previous 8) and advance the potentiometer until the meter reads full scale deflection, i.e., 500 micromhos.

During the calibration of my meter, the local water board kindly measured the water from my kitchen tap. This was found to be 550 micromhos. Cross-checking my meter with a Standard Muirhead Decade Resistance Box, a large error was indicated at full scale deflection (compared with the water board measurement) and I feel it would be necessary to use for calibration several samples of water at constant pH and of known conductivity if the results are to be truly meaningful. However, the little device has been of great help to me and the following results can be expected and have been arrived at by trial and experience:

Tap-water my area—full scale reading pH 7·2.

Rain water—(average) 40 per cent scale reading. Carbon dioxide blown off with aerator pH 7·0.

Water from mixed bed demineralizer resin—pH 6·8 zero reading to 5 per cent scale reading.

Water from separate bed resins F type—pH 7·0. 15 per cent scale reading.

Start of run pH 9·0 50 per cent scale reading—unstable.

End of run pH 5·8 40 per cent scale reading.

Water from separate bed resin H type.

Best of run 30 per cent scale reading.

In my opinion, the best water for Discus fish, which was found by experiment, is pH 6·5, scale reading between 25 per cent and 60 per cent.

Do not assume that you can work out from the figures given a direct relationship between the percentages given and the value of micromhos at full scale deflection. The shape of the poles in the meter may be tailored to suit the meter application requirement in design and the meter will therefore follow that law. Ohmeters are rarely linear, the scale being cramped at one end and expanded at the other.

The device should always be considered as a useful indicator.

OUR READERS WRITE

Starting with Marines

Mr. Lawson's letter greatly interested me and I congratulate him on his "Gamble" coming off so successfully.

I started some months ago and perhaps I can be of help to others if I quote some of my experiences.

My tank is 6½ ft. long,holds 112 gallons, plus over 2 cwt. of Cumberland Limestone. Naturally, I sterilized and boiled everything, but my first trouble was brown *algae*. It grew to about 3 in. long all over the rocks and branch coral. A really filthy sight. So remembering the trouble I had with it years ago in my indoor swimming pool, even though the windows were semi-opaque, I stripped the tank and boiled off the ghastly brown stuff and managed to get some good green *algae* from a friend and on putting it in the tank practically all the fish went for it, particularly a Butterfly which I had been tempting with live food for over a week. After a feed of this green, it ate anything I put in. In fact, I had to stuff bits of the green*algae* deep into the branch coral so that the fish could not get to it and pull it about. Regarding light, I did quite the reverse to Mr. Lawson. My tank is immediately opposite an east window, 12 ft. across and 12 ft. distant from it. It gets all the morning sun and a 5 ft. "Grolux" tube is on every day from 9 a.m. to 11 p.m.

The green *algae* is spreading rapidly over all the rocks, and is short-like velvet, possibly mown down by the thirty-odd fish in the tank. The water is always as clear as crystal.

Another problem solved was that the Wrasse were digging such deep holes in the sand that the wool began to float about in bits in the water. This I have cured by putting the wool between layers of very fine Nylon net. Hence, the bottom of the tank is now, pierced plastic pipes, pierced corrugated sheet of plastic, Nylon net, wool, Nylon net—well tucked down ends and sides—a good inch of coarse gravel, then about two inches of the clean white sand, which, as it so soon looks dirty, I mixed about equal quantity of Southport sand with it. Now the Wrasse can dig as much as they like! In addition to this under-gravel filter I have a large Eheim working full time and another pump going full blast in the centre back of the tank emulating the surging of a coral reef.

The fish include Batfish, four varieties of Wrasse, Wimples, Yellow-tail Damsels. Three very large Anemones in which several varieties of Clowns wallow. The Anemones are white, cream and pink. The five Butterflies and Angels include the Koran and Copperbanded. The latter two are among the greatest gluttons! Every one of these fish greet me as soon as I switch on the light in the morning and take dried food. After lunch I usually manage about a small teaspoonful of white worm—well washed—and of which the pink and white shrimp sees that he gets his share, and in the evening I take prawns from the deep freeze and pour boiling water over them, and pull them into tiny bits which appears to give the fish distended stomachs(!). Anyhow, they are all growing rapidly and are so active that I can't shut my eyes for an after lunch nap!

May I suggest that the best arrangement for the rocks is along the length of the tank in an irregular line about two-thirds of the way from the front, leaving arches and narrow gaps through which the fish can dart. Paint the back of the tank black.

Tackle such a tank whilst you are young. Its no joke heaving rocks of 40-50 lb. gently into a two foot deep tank, and keep moving them until you have a really natural appearance. Thank heaven I'm still in my seventies until next year.

Good luck to other "Gamblers" and experimenters.

V. V. PEDLAR,
Parbold, Lancs.

P.S. *No* brown *algae* has appeared.

P.P.S. Since writing I have added an ordinary phosphorescent 5 ft. tube to the 5 ft. "Grolux" on top of the 6½ ft. aquaria and noticed considerable improvement in the activity of the fish, their appetite and hunting and the spread of the fine green *algae* on the rocks. Has anyone seen three Butterfly fish queueing up to be groomed by a red and white shrimp? Its quite a sight!

Breeding Koi

Reference "Our Readers Write" of July, 1971 issue and Mr. J. F. Gregory's letter of seeming dismay at the statistical information of requirements for Koi Carp breeding.

I sympathise with Mr. Gregory and can report that I have seen plenty of Koi being bred in this country in outdoor ponds where nature is given no help whatsoever in the process. Two years ago my own Koi produced offspring (which I lost excepting one gold). Last year they spawned again, but I placed eggs in pans under cover and results were nil. Moral, as I see it—leave it to nature. One reads about 5 per cent coloured offspring, 95 per cent wild brown colours. This does not always hold true not in my case anyway.

I wish Mr. Gregory better luck next time!

R. L. POULTER,
Arlesey, Beds.

SPONGES

by Henry Tegner

GLAUCUS, who built the sailing vessel *Argo* in which Jason set forth in search of the Golden Fleece, was a sponge diver. Sponges then were a valuable marine commodity. Thousands of people in the recent past were engaged in pursuit of the porifera or parazoa as the sponge is technically called. The sponge, once secured and dried and cleaned, was nearly always used by man as a form of ablutionary aid. Up until the invention of foam-rubber nearly all our bathrooms held some species of these dead marine creatures. Today a sea-sponge in the house is a rarity indeed. There is no doubt that the rubber sponge is a more efficient and durable item than the sea variety. Foam-rubber absorbs water quicker and it lasts much longer than the sea-sponge which sometimes quickly falls to pieces, although some varieties admittedly were quite tenacious. I had a sponge I picked up on the beach at Pollensa in Majorca which lasted me well for nearly two years.

These sponges of old were remarkably interesting creatures for they were, in effect, the skeletons of once living marine animals. Nearly all sponges used in bathrooms came from abroad where large specimens were to be found in the Mediterranean and far-eastern waters. Even so, there are more than 250 species of British sponge and some of these, unlike the drab umber variety in domestic use, are delightfully coloured. There are purple, scarlet, yellow and orange sponges with delightful names life Boring, Breadcrumb and Purse.

In Britain the sponge is not confined to the sea and varieties may be found in fresh water. Really very little is known as yet about the porifera, or parazoa, which is not altogether surprising when it is realised that many of our sponges look rather like the seaweeds. All sponges live in their natural element, water, by absorbing liquid through their myriad pores and then ejecting it (after extracting nourishment from it) through their gut cavities. This mechanism of survival was not known until comparatively recently in the history of science. Aristotle, the great historian who wrote one of the earliest known books the *Historia Animalium*, believed that the sponge came half-way between the plant and animal kingdoms. He was nearer right than some more recent scientists who placed the sponge amongst the marine vegetables. For years controversy has raged over the classification of this aquatic inhabitant. The early naturalists of modern times were inclined to lean towards the sea plant definition. Even Linnaeus, the great Swedish authority, placed the sponge amongst the marine *algae* until he was eventually persuaded by the Englishman, Ellis that the sponge was a living creature!

Back in the bathroom, and by the kitchen sink, another aid to ablution and culinary cleanliness has met its final doom and this is the quaintly named loofah which the dictionary describes as the pod of a plant used as a sponge. The loofah was a fibrous variety of pumpkin or marrow which when defleshed and dried made an admirable scrubber. Loofahs, like sponges, have been superseded by other aids to hygiene as stainless steel wire scrapers, plastic scrubber and such like more durable and lasting variants. Loofahs, unlike the sponge, were never a controversial scientific problem for they were so blatantly vegetable that there could be no possible take-over problem from the zoologically minded.

NEWS ITEM

BABY FISH FOOD EXPORTED TO U.S.

Aquatic products manufacturer, Inter-Pet Ltd. of Dorking, has obtained an initial export order for over 86,000 packs of Liquifry fish food from the U.S.

Liquifry is a specialist fish food, packed in tooth-paste tube-like containers, intended for fish breeding use. This initial U.S. order follows a sales tour by the company's production director, Maurice Martin.

Earlier this year, the company won its first export order for stainless steel aquariums from Sweden—Inter-Pet is now exporting 20 per cent of production to 70 different countries.

Managing director, Dr. Neville Carrington, has himself only just returned from a sales tour in Scandinavia.

"Our exports have doubled this year and within the next two years we expect exports to account for 50 per cent of sales.

"We see export sales as a vital part of our business in providing stability in production as export demand tends to coincide with low seasonal domestic demand.

"Our initial results in the States indicate there is a large potential market for British aquatic products. We also see membership of the EEC opening up new markets for our plastic products which at present have a high tariff barrier into the Common Market."

The Viperine Snake

by Peter Burns

THE Viperine Snake (*Natrix maura*) is closely related to our own Grass Snake (*Natrix n. helvetica*) and is found in many European countries (including France, Italy and Spain) and in N.W. Africa. It is quite a small species—large females barely reaching three feet and males are considerably smaller. It is, however a very attractive snake with the ground colour of the the upperparts sometimes a very pleasing reddish-brown (or sometimes grey-brown). Along the back is a more or less clearly defined, black zig-zag line which breaks up towards the end of the tail. It consequently bears a certain resemblance to the Adder (hence its name) but the two can readily be distinguished by the slimmer body, different shape of head and the eye's circular iris in the case of the Viperine Snake.

Like most of the other members of the genus *Natrix*, this animal is very fond of water and in the wild is found in marshes and by rivers and lakes, etc. Despite this it will thrive in a completely dry environment respecting certain provisos. A suitable cage is provided by a vivarium (or even an old aquarium) with a very thin flooring of dry, aquarium gravel. This should be no deeper than half an inch. If it is any deeper the snake will tend to keep itself buried for most of the time. Gravel is preferable to peat (for example) since the finer particles of the latter tend to adhere to the scales making the snake appear dull and dirty. A hide-out should be provided by an arrangement of rocks in one corner. The top or cover-glass should be close-fitting with provision for adequate ventilation (using perforated zinc). An electric light should be installed and left on for most of the day to give warmth and "sun-bathing."

After purchase most Viperine Snakes settle down quickly so long as they are handled frequently and gently and picked up slowly without too much disruption of the cage contents.

Since there is no water in the cage (the relative humidity must be low to allow easy sloughing and to prevent skin diseases) a snake is best given its water by holding it a few inches above a basin of tepid water —it will then generally lower its head into the water to drink. After this, the snake should be immediately returned to its cage with care for if it is even slightly alarmed, most of the water taken in is generally regurgitated.

Give the snake up to a week to settle down before trying to feed it. If possible, for its first few feeding sessions, fit up a small (say 16 inch or 18 inch) tropical tank with about four or five inches of water, a landing-stage (a half-brick is suitable) and planted out with about a dozen plants such as *Vallisneria*. Because of its aforementioned love of water, the Viperine Snake will immediately enter the water and move easily along the bottom exploring its surroundings by means of its eyes and tongue. Runt Guppies, Tadpoles, Sticklebacks or Minnows should be present and the snake rapidly takes to stalking these with great perseverance. Its methods rather resemble those of a cat—using cover to effect. The prey is eaten live underwater and is swallowed head-first. An eighteen inch long Viperine Snake is quite capable of managing a stocky two inch Minnow. At first, seafish (such as Haddock) is not accepted unless the scent is masked by a more familiar one. Although some books state that earthworms are eaten, I have not yet witnessed this—the worms generally being ignored.

Once the snake is readily feeding underwater on live food; it must be "weaned" onto dead food taken in its usual cage. This is done by offering fresh "de-spined," Sticklebacks (which can be caught in most streams and park lakes) on the end of a thread. This is moved along in front of the snake in the water tank. The fish is seized; the thread is removed by a quick flick of the wrist and the snake is left to swallow its meal. The next fish is held *above* the water and the snake follows to get its food. Dead fish can then be offered in its dry cage simply by dangling it just above the gravel.

Eventually, the thread can be dispensed with and fish will readily be accepted from the fingers.

Sloughing occurs every one or two months and is preceded first by the eyes clouding over with a greyish opaqueness which then clears after a few days. It then sloughs and the dead skin should come off in one piece and if this is so it is a sign of the animal's good health. Sloughing will be more frequent if it has been eating with a good appetite.

Thus it may be concluded that if fed well, has plenty of light for sun-bathing and warmth and is generally treated with care, the Viperine Snake makes a very peaceful, interesting and odourless animal to keep.

News from AQUARISTS' SOCIETIES

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

THE **Bedworth Aquarist and Pool Society** held its third open show recently. The show which is one of the largest of its kind in the Midlands, attracted 690 entries.

Prizewinners: Best fish in show: T. Cruickshank (Ealing A.S.). Best Livebearer: J. Igoe (Sherwood A.S.). Best Killie: B. and F. Hirst (Coventry Pool Society). Best Breeders and Egglayers: R. North. Best Coldwater: Mr. and Mrs. Deakin (Nuneaton A.S.). Most Entries: P. Tedds (Bedworth A.P.S.). Most Awards: Mr. Attwood and Mr. Williams (Rubery Select). Best Cichlid: A. Thomas (Bedworth A.P.S.). Best Barb: Mr. and Mrs. Bird (Bedworth and Leamington). Winner in Best Supported Class: Mr. Gregory (Haden Select). Best Large Fish: Mr. Kinsey (Independent A.S.). Best Small Fish: Mr. Cruickshank. Society with Most Entries: Rubery Select. Society with Most Awards: North Staffordshire Society. AV Guppy: 1, 2 and 4, D. Cannon; 3, S. Hartwell. AV Livebearer: 1, M. Clark; 2, Mr. and Mrs. Hall; 3, R. Marlow; 4, D. Cruickshank. AV Mollies: 1, J. Igoe; 2, R. Woodward; 3, Mr. and Mrs. Bird; 4, R. Commander. Characins (up to 3 in.): 1, B. and F. Hirst; 2, Mr. Noble; 3, H. Williams; 4, F. Matthews. Characins (over 3 in.): 1, Mr. Sewell; 2, Mr. Attwood and Mr. Williams; 3, Mr. Kinsey; 4, Mr. and Mrs. Hough. Barbs (adult up to 3 in.): 1, D. Cruickshank; 2, A. S. Dawes; 3, R. Holmes; 4, D. Basinwood. Barbs (adult, over 3 in.): 1, 2 and 3, Mr. and Mrs. Bird; 4, Mr. Gregory. Cichlids (adult, up to 4 in.): 1, A. Thomas; 2, Miss L. Carter; 3, Mr. and Mrs. Hoben; 4, Mr. Matthews. Cichlids (adult, over 4 in.): 1, Mr. Kinsey; 2, Mr. and Mrs. Hough; 3, Mr. Hooper; 4, Mr. Ancas. Angel Fish: 1, Mr. Sewell; 2, F. Underwood; 3, Mr. Wright; 4, M. Igoe. AOV Anabantid: 1, T. Kirkham; 2, R. Bishop; 3, C. V. Kirkham; 4, Mr. Sewell. AV S. Fighter: 1, Mr. Thomas; 2, Mr. Bowles; 3, Mr. Tedds; 4, F. Hirst. Corydoras Catfish: 1, Mr. Cruickshank; 2, Mr. Bowles; 3, Mr. Sewell; 4, Mr. Bates. AOV Catfish: 1, Mr. Gregory; 2, Mr. Noble; 3, Mr. Attwood and Mr. Williams. Killifish: 1, and 3, B. and F. Hirst; 2, H. Towel; 4, J. Igoe. Rasbora, Danios, W.C.M.M.: 1, Mr. Roberts; 2, Mr. Sewell; 3, Mr. Attwood and Williams; 4, K. Ancas. Egglayers (pairs): 1, Mr. and Mrs. Hough; 2, H. Towel; 3, Mr. Attwood and Mr. Williams; 4, J. Igoe. Livebearers (pairs): 1, R. Tedds; 2 and 3, Mr. Attwood and Mr. Williams; 4, Mr. Sewell. Breeders Egglayers: 1, Mr. and Mrs. North; 2, A. S. Dawes; 3, A. Thomas; 4, B. and F. Hirst. Breeders Livebearers: 1, J. Igoe; 2, Mr. and Mrs. Jones; 3, B. and F. Hirst; 4, Mr. Snell. AOV Tropical: 1, Mr. Whitfield and Mr. Massey; 2, K. Ancas; 3, Mr. Kinsey; 4, Mr. Clark. Fancy Goldfish: 1 and 2, Mr. Deakin; 3, D. Basinwood; 4, Mrs. L. Ancas. AOV Goldfish: 1, R. Commander; 2, Master J. Underwood; 3, Miss K. Underwood; 4, T. Hamshire. AOV Coldwater: 1, M. Clark; 2, L. Ancas; 3 and 4, I. and L. Smith (Nuneaton).

* * *

AT a recent meeting of the **Sittingbourne and District A.S.**, Mr. Forder of the F.B.A.S. kindly judged and donated the prizes to the Society's Table Show of Aquatic Plants. The results were: 1, Mrs. J. Macdonald; 2, Mrs. A. Macdonald; 3, J. Perry. He also gave a very interesting and informative talk on this subject, which was highlighted by some extremely good colour slides. The annual Challenge Cup event was judged by Mr. Knutt, F.B.A.S., and Tottenham A.S. and F. Hunter retained the trophy when he exhibited a bronze catfish. Second was Master P. Bean, who is an eleven-year-old junior member, third being Miss H. Pearson and fourth was J. Gamble. Afterwards Mr. Knutt gave, at the Club's invitation, some valuable criticism of the benched fish and useful information on selective breeding and early feeding of the fry.

* * *

THE **Harrogate and District A.S.** meetings are held every second Tuesday of each month, at the Conservative Rooms, 15 Park View, Harrogate, and anyone coming along will be made welcome. The meetings start at 8 p.m. The committee is as follows: secretary, P. Stothard, 5 Regent Avenue, Harrogate; chairman, I. D. Taylor; treasurer, D. Foster; editor, M. Levett; committee, M. Allen, A. Mason, J. Pendleton. At the last meeting there was a smaller attendance which was low, due to people being on holiday. The result of the Table Show was: Characin: 1, Mrs. Atkinson; 2, Dave Taylor. A.O.V.: 1, Dave Taylor (Best Fish in Show); 2, Mr. Slater; 3, Mrs. Briggs. The main programme of the evening was a quiz, which was enjoyed by everyone. J. Pendleton was quiz master.

* * *

RECENTLY **Skelmersdale A.S.** staged an aquatic show as part of a collective exhibition held in Skelmersdale. Despite a series of unsettling events at the start (not the fault of the aquatic section) the Society presented a fine exhibit which earned a great deal of praise. The results of a Table Show run in conjunction with the show were as follow: Egglayers (pairs): 1 and 2, P. Roberts; 3, R. Atherton. A.O.V.: 1, D. Fairclough (Best in Show); 2, W. Rodgers; 3, P. Roberts. Livebearers: 1 and 3, M. Swain; 2, D. Fairclough. Characins: 1, D. Fairclough; 2 and 3, J. B. Handford. Cichlids: 1 and 2, M. Swain; 3, R. Atherton. Livebearers (pairs): 1, J. Colligan; 2, P. Molyneux.

* * *

THE **Valley A.S.** annual Open Show results: Guppies: 1, H. Baldwin (F.G.A.); 2, D. Charlton (Merseyside); 3, D. Baldwin (F.G.A.). Mollies: 1 and 2, J. Howard (Valley); 3, Mr. and Mrs. Pearson (Sunnybrow). Swordtails: 1, N. R. Gibson (Huddersfield); 2, Mr. and Mrs. Cobb (Bellevue); 3, J. Broadhead (Huddersfield). Platies: 1, Mr. and Mrs. Brierley (Bellevue); 2 and 3, K. Callow (Bellevue). Barbs (up to Rosy Barbs): 1 and 3, F. E. Gregory (Best Fish of Show) (Oldham); 2, D. Charlton (Merseyside). Barbs (Over Rosy Barbs): 1, N. R. Gibson (Huddersfield) 2, B. and B. Booker (Loyne). Small Characins: 1, F. E. Gregory (Oldham); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, P. and H. Batchelor (Loyne). Characins (up to Bleeding Heart): 1, M. Tonge (Oldham); 2, R. McKenna (Nelson); 3, Mr. and Mrs. Warburton (Heywood). Characins (over Bleeding Heart): 1, K. Parkes (Merseyside); 2, Mr. and Mrs. Dean (Ellesmere Port); 3, J. Platt (Ouram). Angels: 1, H. and R. McKenna (Nelson); 2, P. Fairhurst (Valley); 3, W. Smith (Middleton). Dwarf Cichlids: 1, K. Stafford (Oldham); 2, D. Charlton (Merseyside); 3, Mr. and Mrs. Howarth (Morecambe Bay). Large Cichlids: 1 and 2, Mr. and Mrs. Wilkes (Middleton); 3, L. Stock (Bolton). Fighters: 1, Mr. and Mrs. Cobb (Bellevue); 2, Mr. and Mrs. Lord (Valley); 3, P. Kershaw (Castleton). Anabantids (up to 3 in.): 1, Mr. Birchwood (Oldham); 2, Mr. and Mrs. Warburton (Heywood); 3, Mr. and Mrs. Norris (Loyne). A.O.V. Anabantids (over 3 in.): 1, F. Mulla (Merseyside); 2, Mr. and Mrs. Booth (Valley); 3, Mr. and Mrs. Cobb (Bellevue). Rasboras: 1 and 2, D. Charlton (Merseyside); 3, R. Mellacau (Ouram). Danios: 1, T. Hunt (Stretford); 2, Mr. and Mrs. Ross (Bellevue); 3, Mr. Birchwood (Oldham). Minnows: 1, K. Stafford (Oldham); 2, Mr. Birchwood (Oldham). Sharks: 1, Mr. and Mrs. Howarth (Morecambe Bay); 2, B. Norris (Morecambe Bay); 3, S. Berry (Valley). Flying Foxes: 1, K. Parkes (Merseyside); 2, B. and B. Booker (Loyne); 3, D. Charlton (Merseyside). Corydoras: 1, Mr. and Mrs. Cobb (Bellevue); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, Mr. and Mrs. Norris (Loyne). Loaches: 1, F. Mulla (Merseyside); 2, W. Chapman (Valley); 3, B. Norris (Oldham). Catfish: 1, T. Hunt (Stretford); 2, P. Chetham (Bolton); 3, B. and B. Booker (Loyne). Killies (Single): 1, H. Tonge (Oldham); 2, Mr. and Mrs. Thorne (Middleton); 3, J. Platt (Ouram). Egglayers (pairs): 1, F. E. Gregory (Oldham); 2, P. and H. Batchelor (Loyne); 3, D. Charlton (Merseyside). Livebearers (pairs): 1, J. Broadhead (Huddersfield); 2, J. Snowden (Independent); 3, H. Baldwin (F.G.A.). Breeders (Egglayers): 1, J. E. Shore (Ouram); 2, Mr. and Mrs. Cooper (Bury); 3, Mr. and Mrs. Pearson (Sunnybrow). Livebearers: 1 and 3, Mrs. Gibson (Huddersfield); 2, Mr. and Mrs. Cobb (Bellevue). Cold Water Fancy: 1 and 3, S. Walsh (Accrington); 2, Mr. and Mrs. Cobb (Bellevue). Common Goldfish: 1, Mr. and Mrs. Cobb (Bellevue); 2, Mr. and Mrs. Breasley (Bellevue); 3, Mr. Whitsey (Accrington). A.O.V. Coldwater: 1 and 2, S. Walsh (Accrington); 3, Mr. Whitsey (Accrington). A.O.V. Tropical: 1, Mr. and Mrs. Lord (Valley); 2, T. Hunt (Stretford); 3, K. Parks (Merseyside). Juniors: A.V. Egglayers: 1, Miss A. Gregory (Nelson); 2, W. L. Booker (Loyne); 3, Master P. Ashton (Middleton). A.V. Livebearers (Valley Club only): 1, 2 and 3, J. Quinnon. Egglayers (Valley Club only): 1, H. Jones; 2, I. Snowden; 3, H. Goodchild. Section (Valley Club only): 1, M. Goodchild; 2, Mrs. A. Hough; 3, Mr. and Mrs. Lord.

* * *

FULL steam ahead now for the **King's Lynn A.S.** first ever Open Show on Saturday, 30th October. Schedules are available from Brian Capper, 15 Marsh Lane, King's Lynn. The Club have decided that as the October Club night, Tuesday, 5th October, coincides with the function at the Cambridge Club it would be a good idea to combine both events making the Event a night out at the Cambridge Club.

* * *

AT the last monthly meeting of the **Gloucester Fishkeeping and Social Club** members were introduced to their guest for the evening, Mr. John Fellows of Redditch, who with his two assistants presented an interesting Quiz on tropical fish in which all members were able to participate. Arrangements were concluded at this Meeting for the Club to make a presentation of a fully furnished and equipped tropical fish tank for the benefit of the mentally handicapped residents of Oak House Trust at Newland, near Coleford, Glos.

* * *

THE **Hull A.S.** Open Show results were as follow: Coldwater: 1, Mr. Toyne (Sheffield); 2, John and Stella (Sheffield); 3, Mr. Derbyshire (Hull). Cats and Loaches: 1, I. and R. Heppinstall (Castleford); 2, M. Buxton (Sheffield); 3, Mr. Booth (York). Guppy Male or Female: 1, G. Andrews (Hull); 2, I. & R. Heppinstall (Castleford); 3, L. Stephenson (York). Molly: 1, B. Stabler (Hull); 2, Mr. Booth (York). Platy: 1, Mr. Booth (York); 2, I. and R. Heppinstall (Castleford); 3, Mr. Singleton (York). Swordtail: 1 and 3, B. Stabler (Hull); 2, T. Douglas (Hull). Rasbora—Danios—Minnows: 1 and 2, Mr. Stanton (Sheffield); 3, T. Douglas (Hull).

Barbs: 1 and 2, John and Stella (Sheffield); 3, L. and R. Heppinstall (Castleford). Cichlids (Large): 1, Mr. and Mrs. Gates (Castleford); 2, Mr. Booth (York); 3, T. Collingwood (Hull). Cichlids (Dwarf): 1 and 3, L. and R. Heppinstall (Castleford); 2, Mr. Turner (York). Characins: 1, Mr. Singleton (York); 2, Mr. Stanton (Sheffield); 3, T. Collingwood (Hull). Fighters—Male or Female: 1 and 3, A. Douglas (Hull); 2, L. and R. Heppinstall (Castleford). Anabantids (excluding Fighters): 1, John and Stella (Sheffield) (Best Fish—Aquarist Gold Pin and C. Hodgson Shield Awarded); 2, Mr. Allison (York); 3, Master I. Hollingsworth (Hull). Breeders (Livebearers): 1, T. Douglas (Hull); 2 and 3, G. Andrews (Hull). Breeders (Egglayers): 1, G. Andrews (Hull) (Best Exhibit A.Y.A.S. Diploma Awarded); 2, T. Collingwood (Hull); 3, Mr. Mawe (Hull). Toothcarps (Egglayers): 1, I. Stephenson (York); 2, L. and R. Heppinstall (Castleford); 3, Mr. Allison (York). Sharks and Flying Foxes: 1, Mr. Turner (York); 2, T. Collingwood (Hull); 3, A. E. Whitelock (Tadcaster). Any Other Variety: 1, L. and R. Heppinstall (Castleford); 2, Mr. Booth (York); 3, Mr. Walker (Hull). Pairs (Livebearers): 1, L. and R. Heppinstall (Castleford); 2, B. Stabler (Hull); 3, I. Stephenson (York). Pairs Egglayers: 1, A. Douglas (Hull); 2, T. Douglas (Hull); 3, I. Stephenson (York). Best Fish in Show: John and Stella (Sheffield). Best Exhibit: G. Andrews (Hull). Furnished Tanks: Senior: 1, J. Mitchell (Hull); 2, A. Douglas (Hull); 3, Mrs. B. Batch (Hull). Junior: 1, Miss L. Hastings (Hull); 2, Master D. Hollingsworth (Hull); 3, Miss S. Hastings (Hull).

* * *

AT the July meeting of the **Grimsby and Cleethorpes A.S.** the members held a general discussion evening. Mr. A. Metcalf gave a talk on plants of the tropical aquarium. Table Show results: A.O.V. (Coldwater): 1, B. Pulford. Mollies: 1, C. Easton; 2, L. Dearden. Angels: 1, K. Svenson; 2, R. Jennings; 3, L. Dearden. Loaches: 1 and 3, M. Robinson; 2, C. Easton. Dwarf Cichlids: 1, I. Thompson; 2, M. Robinson; 3, R. Jennings. Plants: 1, M. Robinson; 2, L. Dearden; 3, C. Easton. Killies: 1, L. Dearden; 2 and 3, J. Clovis. Female Guppy: 1, J. Hawdon; 2 and 3, C. Easton. Fighters: 1, J. Dawson. Breeders Egglayers: 1, P. Jenson; 2, M. Robinson; 3, C. Easton.

Members were entertained at the August meeting by a quiz programme followed by a tape and slide show entitled "So you want to be an Aquarist." Table Show results: Small Barbs: 1, P. Jenson; 2 and 3, D. Hughes. A.O.V. Livebearers: 1 and 2, L. Dearden. Large Characins: 1 and 2, C. Easton; 3, M. Robinson. Danios: 1, C. Easton; 2 and 3, L. Dearden. Furnished Jar: 1 and 3, L. Dearden; 2, S. Walker. Breeders (Livebearers): 1, L. Dearden. Platy (Pairs): 1, C. Easton; 2, L. Dearden.

* * *

A debate was the main item at the August meeting of **Ilford & District Aquarist' & Pondkeepers' Society.** Three issues relating to the maintenance and conditions in which aquariums are kept and their environments were the subjects involved. The first discussion being Filtration or Not? This revolved around a massive variety of types of filter and combinations. The majority of the member present, were without doubt in favour of external filters and a good deal of heated discussion took place before a vote was taken deciding that filters were a necessary commodity in the aquarium. The second discussion was on lighting and this again proved very interesting, with most members agreeing that a combination of tungsten lamps (40 watts per foot of quaurium), plus a fluorescent tube (Growlux at 10 watts per foot of aquarium) were the most desirable for the promotion of good plant growth and pleasantness of effect. The third discussion was on Live Food or Dry? and there was some considerable difference of opinion on this subject, with a large number of members stating that some of the finest specimens had been reared on nothing but dry foods. Another drawback against live foods was the possibility of introducing unwanted pests into the aquarium with fatal results to the inhabitants. All in all a final decision could not be reached due to the complete difference of individual preference.

Results of the monthly Table Show was as follow: A.V. Tropical Plant: 1, 2, 3 and 4, D. Seaman. A.V. Cichlid: 1, 2 and 3, C. Ollie; 4, Mr. Rendol.

* * *

THE first Open Show of **Runcorn A.S.** was held recently and the results were as follow: Guppies: 1, Mr. Whitney (Independent); 2, Mrs. Addison (Warrington); 3, Master A. Kaye (TopTen). Mollies: 1, M. Berry (Valley); 2, Mr. and Mrs. Lewis (Merseyside); 3, D. Walker (Runcorn). Platies: 1 and 3, C. and M. Riseley (Ashton-u-Lyne), Section Winner; 2, L. Kaye (Top Ten). Swordtails: 1, C. and M. Riseley (Ashton-u-Lyne); 2, K. Shaw (Huddersfield); 3, N. R. Gibson (Huddersfield). Small Barbs: 1 and 3, N. Peterson (Merseyside), Section Winner; 2, R. and A. Johnson (Ashton-u-Lyne). Large Barbs: 1, N. Peterson (Merseyside); 2, I. Rowbottom (Hyde); 3, N. R. Gibson (Huddersfield). Labeos, Sharks and Flying Foxes: 1, D. Charlton (Merseyside), Section Winner; 2, N. Peterson (Merseyside); 3, S. Berry (Valley). Loaches: 1, G. Stewart (Hyde), Section Winner; 2, D. Walker (Runcorn); 3, N. R. Gibson (Huddersfield). Corydoras, Catfish: 1 and 3, K. Ankers (North Staffs); 2, M. Clarke (North Staffs). A.O.V. Catfish: 1, P. Gibson (Merseyside), Section Winner; 2, R. Antonio (Northwich); 3, K. Blease (Runcorn). Anabantids: 1, F. Mulla (Merseyside), Section Winner; 2, D. Walker (Runcorn); 3, Master J. Faulkner (Merseyside). Fighters: 1, Mr. and Mrs. Faulkner (Merseyside); 2, A. Thompson (Runcorn). Dwarf Cichlids: 1, N. Peterson (Merseyside); 2, P. Rodgers (Stretford); 3, F. Ledger (Top Ten). Large Cichlids: 1, S. Berry (Valley), Section Winner; 2, K. Parkes (Merseyside); 3, Mr. and Mrs. Lomas (Merseyside). Angels: 1 and 3, G. W. and A. K. Jackson (Belle Vue); 2, E. Rowlands (Hoylake). Small Characins: 1, Miss B. Kaye (Top Ten); 2, A. Hulmes (Runcorn); 3, K. Ankers (North Staffs). Large Characins: 1, N. Peterson (Merseyside), Section Winner; 2, Mr. and Mrs. Lomas (Merseyside); 3, K. Parkes (Merseyside). Tooth Carps: 1, J. Lawton (Warrington), Section Winner; 2, L. Kaye (Top Ten). Rasboras and Danios: 1, D. Charlton (Merseyside), Section Winner; 2, T. Hunt (Stretford); 3, Mr. and Mrs. Lomas (Merseyside). Breeders (Egglayers): 1 and 2, N. R. Gibson (Huddersfield), Section Winner; 3, K. McMurry (Runcorn). Breeders (Livebearers): 1, N. R. Gibson (Huddersfield), Section Winner; 2, G. Hardwick (Hoylake); 3, B. Newport (Runcorn). True Pairs (Egglayers): 1, Miss B. Kaye (Top Ten); 2, F. Mulla (Merseyside); 3, Mr. and Mrs Faulkner (Merseyside). True Pairs (Livebearers): 1, G. Stewart (Hyde), Section Winner; 2, Mr. and Mrs. Faulkner (Merseyside); 3, K. Shaw (Huddersfield). A.O.V.: 1, K. Parkes (Merseyside), Section Winner; 2, T. Hunt (Stretford); 3, L. Kaye (Top Ten.) Junior A.O.V.: 1, S. Kell (Illesmere Port), Section Winner; 2, Miss A. Johnson (Ashton); 3, Master T. Dean (Illesmere Port). Ladies A.O.V.: 1, Miss B. Kaye (Top Ten), Section Winner; 2, Mrs. A. Gaskell; 3, Mrs. Dean (Illesmere Port). Fancy Goldfish: 1, K. Ankers (North Staffs), Section Winner; 2 and 3, Master A. Kaye (Top Ten). A.O.V. Coldwater: 1, M. Clarke (North Staffs); 2, B. Newport (Runcorn). Common Goldfish: 1, Mr. and Mrs. Brearley (Belle Vue). Fish of the Show was won by P. Gibson (Merseyside) and Merseyside won the trophy for the Club with the Most Points. The Award for the Runcorn members with most points went to D. Walker, and B. Newport won the Junior Members' Trophy.

* * *

ONCE again the attendance and entries were up at the **North Staffs. A.S.** third open show. Best fish in the show was exhibited by Messrs. Whitfield and Massey of Rubery Select. Other results were: Breeders (Livebearers): 1, J. Igoe (Sherwood); 2, A. Smith (Stone); 3, Mr. and Mrs. Carter (Bedworth); 4, B. A. Bush (Mkr. Drayton). Breeders (Egglayers): 1, J. E. Shore (Osram); 2, J. Sanders (Stone); 3, G. Bold (Stone); 4, Mr. and Mrs. Carter. Pairs (Livebearers): 1, Mrs. L. Whitfield (Rubery); 2, Mr. Attwood and Mr. Williams (Rubery); 3, J. Igoe; 4, H. Williams (N. Staffs.). Pairs (Egglayers): 1, K. Ankers (N. Staffs.); 2, A. Smith; 3, W. Hickman (Dudley); 4, Mr. Attwood and Mr. Williams. Guppies: 1, R. Harlow (Derby); 2, 3 and 4, R. Holmes (Derby). Platys: 1 and 2, Mr. Attwood and Mr. Williams; 3, Mr. and Mrs. S. Hall (Nuneaton); 4, W. Day (N. Staffs.). Swordtails: 1, P. Leese (Stone); 2, W. D. Brown (Mkt. Drayton); 3, R. Harlow; 4, W. Copestick (N. Staffs.). Mollies: 1, J. Igoe; 2, V. Knowles (N. Staffs.); 3, R. Woodward (Rubery); 4, Mr. and Mrs. Lofthouse (Huddersfield). Rasboras: 1, Mr. and Mrs. Downing (Sherwood); 2, Mr. Attwood and Mr. Williams; 3, Mr. and Mrs. Downing; 4, A. Smith. Danios, W.C.M.M. and Rainbows: 1, A. H. Webb (N. Staffs.); 2, R. Holmes; 3, Mrs. Blades (Worksop); 4, D. Wilson (Lower Gornal). Toothcarps: 1 and 2, Mr. and Mrs. Lofthouse; 3, Mr. Hadden (Stone); 4, G. Bold. Siamese Fighters: 1 and 3, J. S. Booth (N. Staffs.); 2, N. Furness (Rubery); 4, S. Bloor (N. Staffs.). AOV Anabantids: 1, R. Mayer (N. Staffs.); 2, W. Hickman; 3, W. Day; 4, F. R. Shakespere (Bedworth). Small Barbs: 1, R. Holmes; 2, A. Colclough (N. Staffs.); 3, A. Smith; 4, D. R. Cleaver (Rubery). Large Barbs: 1 and 2, N. Hubert (Ind.); 3, J. Sanders; 4, W. Day. Dwarf Cichlids: 1, A. Thomas (Bedworth); 2, A. Smith; 3, W. Hickman; 4, F. Martin (Alfreton). Angel Fish: 1, Mrs. M. Igoe (Sherwood); 2, B. Hughes (Stone); 3, Mr. Rowlands (Hoylake); 4, Mr. Hadden. Large Cichlids: 1, V. Knowles; 2, N. Hubert; 3, Mr. Stanway (N. Staffs.); 4, N. Hubert. Small Characins: 1 and 2, J. S. Booth; 3, H. Williams; 4, J. Sanders. Large Characins: 1, Mr. Attwood and Mr. Williams; 2, W. Hickman; 3, Mr. Evans (Crewe); 4, W. D. Brown. Sharks and Flying Foxes: 1, K. Ankers; 2, W. Hickman; 3, R. Harlow; 4, A. Thomas (Bedworth). Corydoras Catfish: 1, N. Furness; 2, D. Aldred (Stone); 3, K. Ankers; 4, J. B. Tucker (Stone). AOV Cats.: Mrs. J. Woodward (Rubery); 2, J. S. Booth; 3, A. Ankers (N. Staffs.); 4, Mr. Attwood and Mr. Williams. Loaches: 1, A. G. Hallam (N. Staffs.); 2 and 3, K. Thomas (Lucas); 4, H. Williams. AOV Tropical: 1, Mr. Whitfield and Mr. Massey (Rubery); 2, K. Ankers; 3, Mr. and Mrs. Hall (Nuneaton); 4, M. Clarke (N. staffs.). Junior AV: 1, R. Ankers (N. Staffs.); 2, R. and R. Commander (Tamworth); 3, D. Ankers (N. Staffs.); 4, J. Ankers (N. Staffs.). Fancy Goldfish: 1 and 3; M. Deakin (Nuneaton); 2, Mrs. L. Ankers (N. Staffs.); 4, R. and R. Commander. AOV Coldwater: 1, Mrs. L. Ankers; 2, M. Clarke; 3, Mr. and Mrs. Downing; 4, P. Bryan (Ind.).

* * *

MEMBERS of the **Harlech A.S.** recently paid a most enjoyable visit to the Bristol Zoological Gardens to undertake, by kind permission of the Director, a "behind the scenes" tour of both the aquarium and reptile house. The day was completed by a mystery tour terminating at Cheddar Gorge.

An interesting and varied programme is being compiled for the coming year, and prospective new members are most welcome to attend any meetings of the society, which are held on the third Tuesday of each month at the Gabalfa Junior School, Colwill Road, Cardiff, commencing at 7.45 p.m. The secretary is Mr. M. J. Parry, 7 Thornhill Street, Canton, Cardiff. (Telephone 397628.)

* * *

RESULTS of the **Irish Federation of A.S.** annual show: Common Goldfish, London Shubunkins: T. McCutcheon. Comets and Bristol Shubunkins: P. Robbins. AOV Fancy Goldfish: G. Taylor. AOV Coldwater: G. Taylor. Male Guppies: H. Mawhinney.

DISINFECT NEW PLANTS AND FISH WITH holamid
Hillside Aquatics London N12

Female Guppies: G. Murphy. Mollies: S. Mooney. Platies: G. McComb. Swordtails: C. Lamont. Small Rasboras and Small Danios: Mrs. J. M. Carr. Large Rasboras and Large Danios: H. Mawhinney. Small Gouramies: W. McAuley. Large Gouramies: Mr. and Mrs. L. Burrows. AOV Labyrinth Fish: H. Dunn. Siamese Fighters: A. Sherlock. Small barbs: R. Revie. Large barbs: M. Carlisle. Corydoras: S. Mooney. AOV Catfish, Loaches, Botias: J. Taylor. Neons, Cardinals, Black Neons, Glowlights and Belgian Flags: H. McWaters. Small Characins: R. Revie. Large Characins: D. Robbins. Small Cichlids: A. Sherlock. Large Cichlids: R. Revie. Killifish: A. Sherlock. Rainbows: R. Revie. AOV Egglayer: A. Sherlock. Breeders (Livebearers): T. McCutcheon. Breeders (Egglayers): S. Mooney. Pairs (Egglayers): W. McKee. Pairs (Livebearers): T. McCutcheon. Angel Fish: T. Griffiths. Sharks: T. Griffiths. Echinodorous plants: S. Mooney. Cryptocoryne plants: D. Jamison. Vallisneria and Sagittaria plants: H. Dunn. Cabomba, Ambulia, Elodea and Myriophyllum plants: S. Mooney. AOV Aquatic plant: S. Mooney. Furnished Aquaria: P. Lavery. Novelty Furnished Aquaria: J. Cowan.

* * *

THE first meeting of the **Pisces Aquarist Club, Bournemouth** was held in February. A visit and guided tour behind the scenes of the aquarium at the Zoological Society of London has been made already. This was a first class tour and the zoo staff were very helpful. The Society meets every three weeks at 5 Cecil Road, Boscombe and have their own club breeding House, open to all members and equipped with thirteen breeding tanks, two rearing tanks and two quarantine tanks. It is intended to add more tanks later.

New members are welcome and there is now an average meeting of twenty members. The officials are Secretary: M. Abraham; Chairman: J. Gibson; Committee: R. Taylor, D. Nichols, B. Pink. Visitors from other clubs are always welcome if in the area and are requested to write giving two dates.

* * *

THE second open show results of the **Scarborough and District A.S.** Were as follow: Guppies: 1 G. Andrews (Hull); 2, I. Stephenson (York); 3, Mr. and Mrs. Wells (Doncaster). Platys: 1, P. Booth (York); 2, I. and R. Hepinstall (Castleford); 3, J. S Hall (Aireborough). Mollies: 1, J. S. Hall (Aireborough); 2, B. Stabler (Hull); 3, J. Whitely (Aireborough). Swordtails: 1, B. Stabler (Hull); 2, Mr. and Mrs. Cohen (Castleford, 3, N. Stabler (Hull). AOV Livebearers: 1, I Stephenson (York); 2, I. and R. Hepinstall (Castleford); 3, J. S. Hall (Aireborough). Pairs (Livebearers): 1, I. Stephenson (York); 2, I. and R. Hepinstall (Castleford); 3, Mr. and Mrs. Lofthouse (Huddersfield). Pairs (Egglayers): 1, J. Whitely (Aireborough); 2, Mrs. Richardson (Ind.); 3, I. and R. Hepinstall (Castleford). Breeders (Egglayers): 1 and 3, Mr. and Mrs. Cohen (Castlefored); 2, A. Corchin (Swillington). Breeders (Livebearers): 1, G. Andrews (Hull); 2 and 3, Mr. and Mrs. Cohen (Castlefored). Barbs (up to but exc. Rosy): 1, J. Whitely (Aireborough); 2, W. Messruther (Scarborough) 3, P. Carey (York). Barbs (over and inc. Rosy): 1, J. Robertson (Mount Pleasant); 2, G. Batch (Hull); 3, Mr. and Mrs. Cohen (Castleford). Sharks and Flying Foxes: 1, D. Hockley (York); 2, J. Whitely (Aireborough); 3, Mr. and Mrs. Gates (Castlefored). Characins (up to but exc. Bleeding Heart Tetras): 1, E. Leadley (York); 2, Mr. and Mrs. Gates (Castleford); 3, Mr. Hart (Keighley). Characins (over and inc. Bleeding Heart Tetras): 1, F. Sonley (Ind.); 2, P. Reynolds (Swillington); 3, T. Leighton (Scarborough). Cichlids (up to but exc. Jewel Cichlid): 1, P. Reynolds (Swillington); 2, S. Rhodes (4 Star); 3, I. and R. Hepinstall (Castleford). Cichlids (over and inc. Jewel): 1, I. Stephenson (York); 2, J. Robertson (Mount Pleasant); 3, S. and A. Thomas Castleford). Rasborras, Danios and Minnows: 1, Mr. and Mrs. Cohen (Castlefored); 2, Mr. and Mrs. Wells (Doncaster); 3, I. and R. Hepinstall (Castleford). Siamese Fighters: 1, Mr. and Mrs. Low (Cleveland); 2 and 3, Mr. and Mrs. Cohen (Castleford). AOV Anabantid: 1, Mr. and Mrs. Cohen (Castlefored); 2, Mr. and Mrs. Wells (Doncaster); 3, P. Booth (York). Corydoras Catfish: 1, M. Buxton (Sheffield); 2, P. Booth (York); 3, I. and R. Hepinstall (Castleford). AOV Catfish and Loaches: 1, Mr. and Mrs. Hepinstall (Castleford); 2, Mr. and Mrs. Low (Cleveland); 3, Mr. and Mrs. Gates (Castleford). Toothcarps: 1 and 3, M. M. and A. Crowther (Swillington); 2, Mr. and Mrs. Lofthouse (Huddersfield). AOV Tropicals: 1, M. Donaldson (York); 2, Master N. Cook (Doncaster); 3, I. and R. Hepinstall (Castleford). Goldfish: 1 and 2, Mr. and Mrs. Toyne (Sheffield); 3, J. S. Hall (Aireborough). Fancy Goldfish: 1, 2 and 3, J. S. Hall (Aireborough). AOV Coldwater: 1, I. Stephenson (York); 2 and 3, J. S. Hall (Aireborough). Best fish in show: F. Sonley's Characin—Leporinus Fasciatus.

* * *

AFTER the success of their open show, last May, **Derby Regent A.S.** followed up with an exhibit at the local Kingsway Hospital show, with fish supplied by T. Jerram and D. Gibson, and organised by E. Haraldine, with the able support of a number of members. In July, Alfreton A.S. joined Derby for an inter-club competition in which there were 112 entries. The judge was B. Inman of Nottingham, and the award for best fish went to Mr. Hill of Alfreton. Derby's new Show Secretary, Reg Harlow, of 180 Mansfield Road, Derby, has fixed a return date of October 1st. In August, R. Tench spoke on Fish Foods and Feeding and the Speakers during the next few months will include R. Skipper, of Discus fame, and I. Beards, the club's electrical expert. Other activities include regular weekend outings and a Dinner with a talk by R. V. F. Torrington on Britain's waterways, called "The Gentle Roadway."

* * *

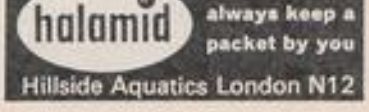
THE results of the **Ashton-under-Lyne and District A.S.** open show were as follow: Guppies: 1, Mr. and Mrs. Ross; 2, Mr. and Mrs. Ormesher; 3, Mrs. J. Shackleton. Swordtails: 1, Mr. and Mrs. Lofthouse; 2, Mr. and Mrs. Clark; 3, P. Danielson. Platies: 1, Mr. and Mrs. Ormesher; 2, Mrs. Davies; 3, W. Smith. Mollies: 1, Mr. Abelbowling; 2, Mr. and Mrs. Grimshaw; 3, M. Walne. Section Winner: Mr. and Mrs. Ormesher. Small Anabantids: 1, P. Rogers; 2, Mrs. J. Shackleton; 3, Mrs. Davies. AOV Anabantids: 1, G. W. A. K. Jackson; 2, F. Mulla; 3, E. Birchwood. Fighters: 1, Mrs. Davies; 2, P. Shackleton; 3, J. Wike. Section Winner: G. W. A. K. Jackson. Dwarf Cichlids: 1, M. Tonge; 2, Mrs. S. Hoyle; 3, J. S. Hall. Large Cichlids: 1 and 3, Mr. and Mrs. Wilkes; 2, Mrs. Davies. Angels: 1, G. W. A. K. Jackson; 2, P. Rodgers; 3, S. Robinson. Section Winner: Mr. and Mrs. Wilkes. Small Barbs: 1, R. and A. Johnson; 2, Mr. and Mrs. Pearson; 3, Mr. Abelbowling. Large Barbs: 1, K. Parkes; 2, Mr. Abelbowling; 3, I. Rowbottom. Section Winner: K. Parkes. Small Characins: 1, G. W. A. K. Jackson; 2, Mr. and Mrs. Wilkes; 3, D. and R. Standen. Large Characins: 1, K. Parkes; 2, J. S. Hall; 3, P. Leese. Section Winner: G. W. A. K. Jackson. Rasboras, Minnows, Danios: 1, Mr. and Mrs. Ashton; 2, D. Charlton; 3, Mr. and Mrs. Ross. Section Winner: Mr. and Mrs. Ashton. Toothcarps: 1, Mr. and Mrs. Lofthouse; 2, J. Roberts; 3, M. Tonge. Section Winner: Mr. and Mrs. Lofthouse. Small Catfish: 1, Master F. Cobb; 2, Mr. and Mrs. Ashton; 3, S. Robinson. AOV Catfish: 1, Mr. and Mrs. Beswick; 2, J. S. Booth; 3, L. Dunn. Loaches: 1, F. Robinson; 2, Mr. and Mrs. Pearson; 3, F. Mulla. Section Winner: F. Robinson. Sharks: 1, Mr. and Mrs. Ashton; 2, G. Hodgekinson; 3, H. Lees. Flying Foxes: 1, N. R. Gibson; 2, Mr. and Mrs. Riseley; 3, Mr. and Mrs. Wilkes. Section Winner: Mr. and Mrs. Ashton. Pairs (Livebearers): 1, B. Phillips; 2, M. Brearsley; 3, S. Robinson. Pairs (Egglayers): 1, Mr. F. Mella; 2, E. Dawson; 3, K. Parkes. Section Winner: Mr. Mulla. Breeders (Livebearers): 1, C. Greenough; 2, P. Danielson; 3, Mr. and Mrs. Ross. Breeders (Egglayers): 1, Mr. and Mrs Beswick; 2, Mr. and Mrs. Pearson; 3, N. R. Gibson. Section Winner: Mr. and Mrs. Beswick. AOV Tropical: 1, R. Barber; 2, T. Hunt; 3, Mrs. J. Tonge. Section Winner: R. Barber. Common Goldfish: 1, D. Charlton; 2, J. S. Hall; 3, Master F. Cobb. Fancy Goldfish: 1 and 2, J. S. Hall; 3, J. Eyres. AOV Coldwater: 1, Mr. and Mrs. Grimshaw; 2, J. S. Hall; 3, J. Eyres. Section Winner: J. S. Hall. Juniors AOV: 1, Master F. Cobb; 2, Master P. Ashton; 3, Miss A. Gregory. Section Winner: Master F. Cobb. Mini-Furnished Jars with Fish: 1, E. Birchwood; 2, Mrs. Pearson. Section Winner: E. Birchwood. Best Fish in Show and Aquarist Gold Pin: K. Parkes. Livebearer Trophy: Mr. and Mrs. Ormesher. Catfish and Loach Trophy: F. Robinson. Pairs Trophy: F. Mulla. Breeders Trophy: Mr. and Mrs. Beswick. Juniors Trophy: Master F. Cobb. Exhibitor Gaining Most Points: J. S. Hall. Lady Exhibitor Gaining Most Points: Mrs. Davies.

* * *

IN August at the **Chelmsford A.S.** monthly meeting when the guest speaker, on a return visit, G. Yarrop, gave a very interesting talk on fishkeeping and general items on breeding and keeping fish in top condition. The table show was well entered, the class being Tropical Pairs. Winners were: 1, T. Heath; 2, Mrs. V. Heath; 3, K. Turner. This meeting was well attended taking into consideration that this was one of the peak holiday weeks.

* * *

RESULTS of the first Open Show of the **Sandgrounders A.S.:** Guppies: 1, K. Callow (Belle Vue); 2, P. M. J. Lunt (Merseyside); 3, J. Peck (Loyne). Swordtails: 1 and 2, N. R. Gibson (Huddersfield); 3, Mr. and Mrs. Ormesher (Sandgrounders). Platies: 1 and 3, J. S. Hall (Aireborough); 2, Mr. and Mrs. Cobb (Belle Vue). Mollies: 1, Mr and Mrs. Grimshaw (Sunnybrow); 2, K. Knowles (Northwich and Dist.); 3, W. Nixon (Sunnybrow). Small Anabantid: 1, K. Callow (Belle Vue); 2 and 3, E. Birchwood (Oldham). Large Anabantid: 1, F. Mulla (Merseyside); 2, Mr. and Mrs. Lewis (Merseyside); 3, Master John Faulkner (Merseyside). Fighters: 1, J. S. Hall (Aireborough); 2, Mr. and Mrs. Cobb (Belle Vue); 3, Master S. Robinson (Sunnybrow). Dwarf Cichlids: 1, M. Tonge (Oldham); 2, P. Ground (Sandgrounders); 3, Mr. and Mrs. Ormesher (Sandgrounders). Large Cichlids: 1, K. Parkes (Merseyside); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Norris (Loyne). Angels: 1, E. Rowlands (Hoylake); 2, F. Robinson (Sunnybrow); 3, T. Ainsworth (Oxram). Small Barbs Characins: 1, M. D. Wilson (Merseyside); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, G. Blease (Merseyside). Large Barbs Characins: 1, K. Parkes (Merseyside); 2, Mr. and Mrs. Dean (Ellesmere Port); 3, Mr. and Mrs. Booker (Morecambe Bay). Small Barbs: 1, Mr. and Mrs. Cobb (Belle Vue); 2, P. M. J. Lunt (Merseyside); 3, E. Smith, Jnr., (Sheffield). Large Barbs: 1, N. R. Gibson (Huddersfield); 2, I. Rowbottom (Hyde); 3, Master John Faulkner (Merseyside). Rasboras: 1, D. Charlton (Merseyside); 2, Mr. and Mrs. Norris (Loyne); 3, M. Tonge (Oldham). Minnows: 1, Master P. Kewley (Independent); 2, E. Birchwood (Oldham); 3, E. Smith (Sheffield). Danios: 1, T. Hunt (Stretford); 2, Mr. and Mrs. Ormesher (Sandgrounders); 3, E. Smith, Jnr (Sheffield). Toothcarps: 1, E. Smith, Jnr (Sheffield); 2, M. Tonge (Oldham); 3, R. Knowles (Northwich and Dist.). Small Catfish: 1, Mr. and Mrs. Cobb (Belle Vue); 2, Mr. and Mrs. Wells (Doncaster) 3, Mr. and Mrs. Grimshaw (Sunnybrow). A.O.V. Catfish: 1, T. Hunt (Stretford); 2, Mr.



and Mrs. Booker (Morecambe Bay); 3, P. Gibson (Merseyside). Loaches: 1, Mr. and Mrs. Lewis (Merseyside); 2, Mr. and Mrs. Coward (Loyne); 3, F. Mulla (Merseyside). Sharks: 1, Mr. and Mrs. Howarth (Morecambe Bay); 2, Master S. Robinson (Sunnybrow); 3, Mr. and Mrs. Norris (Loyne). Flying Foxes: 1, Mr. and Mrs. Norris (Loyne); 2, Mr. and Mrs. Booker (Morecambe Bay). Pairs (Livebearers): 1, G. Stewart (Hyde); 2, Mr. and Mrs. Ormesher (Sandgrounders); 3, Mr. and Mrs. Pearson (Sunnybrow). Pairs (Egglayers): 1, B. W. Carter (Merseyside); 2, Master S. Robinson (Sunnybrow); 3, P. Robinson (Sunnybrow). Breeders (Livebearers): 1, N. R. Gibson (Huddersfield); 2, Mr. and Mrs. Cobb (Belle Vue); 3, Mr. and Mrs. Wells (Doncaster). Breeders (Egglayers): 1, Mr. and Mrs. Wells (Doncaster); 2, P. Ground (Sandgrounders); 3, Mr. and Mrs. Pearson (Sunnybrow). A.O.V. Tropical: 1, T. Hunt (Stretford); 2, K. Parkes (Merseyside); 3, T. S. Hall (Aireborough). Common Goldfish: 1, Mr. and Mrs. Cobb (Belle Vue); 2 and 3, J. S. Hall (Aireborough). Fancy Goldfish: 1 and 2, J. S. Hall (Aireborough); 3, C. H. Whitney (Accrington). A.O.V. Coldwater: 1 and 3, J. S. Hall (Aireborough); 2, C. H. Whitney (Accrington). Junior (Livebearers): 1, Kevin Nicholson (Loyne); 2, Linda Nicholson (Loyne); 3, Miss S. Rowlands (Hoylake). Junior (Egglayers): 1, Miss A. Gregory (Nelson); 2, Master N. Cook (Doncaster); 3, Master G. Wilkinson (Hyde). Ladies Any Variety: 1, Mrs. J. Tonge (Oldham); 2, Mrs. D. Lomas (Merseyside); 3, Mrs. M. Dean (Ellesmere Port). Exhibitor gaining most points "Fish Pad Trophy": J. S. Hall. Best in Show: K. Parkes. Sandgrounders Livebearer Trophy: N. R. Gibson. Stephen Hughes Anabantid Trophy: F. Mulla. Chairman's Characin Trophy: K. Parkes. Peter Ground Cichlid Trophy: M. Tonge. A.O.V. Aceanarium Trophy: T. Hunt.

* * *

RESULTS of the **High Wycombe A.S.** Open Show: Club Furnished Aquaria: 1, Finnamore F.F.; 2, Riverside A.S.; 3, High Wycombe A.S.; 4, Portsmouth A.S. Individual Furnished Aquaria: 1, M. Goss; 2, Mr. and Mrs. S. Collins; 3, Mr. and Mrs. G. Whitby; 4, Mr. and Mrs. M. Edwards. Barbs: 1 and 3, C. Pike; 2, Mrs. B. L. Cowell; 4, P. Grosvenor. Characin: 1 and 3, S. Cowell; 2, A. J. H. Smith; 4, M. Carter. Hyp. Hem. Cher.: 1, R. Bowes; 2, A. J. H. Smith; 3, M. Carter; 4, B. Sargent. Cichlid: 1, A. M. Kinsey; 2, M. Strange; 3, Mrs. M. Nethersell; 4, A. Marshall. Apist. Pel. Nann.: 1, M. Strange; 2, R. Bowes; 3, R. J. Weston; 4, N. Davis. Labyrinths: 1, S. Cowell; 2, J. Stamp; 3, Reg Peck; 4, R. Wright. Siamese Fighters: 1, P. Shepherd; 2 and 4, Mrs. C. Sheldon; 3, R. Peck. Egglaying Toothcarps: 1, Mr. and Mrs. J. E. Myers; 2, D. W. Crowe; 3, C. Pike; 4, R. C. Burton. Tropical Catfish: 1, D. H. Walls; 2, J. Batts; 3 and 4, Mrs. M. Nethersell. Corydoras and Brochis: 1, B. E. Bullock; 2, D. Reilly; 3, Mrs. M. Nethersell; 4, R. Wright. Rasbora: 1, C. Pike; 2, M. Carter; 3, D. Putt; 4, Mrs. J. Garrad. Danio and W.C.M.M.: 1 and 2, M. Carter; 3, A. M. Kinsey; 4, D. Reilly. Loach: 1, M. Carter; 2, A. Marshall; 3, R. Leslie; 4, A. Wood. A.O.S. Tropical Egglayer: 1, R. Ilsley; 2, Mrs. J. Garrad; 3, Mrs. C. Bowes; 4, P. Newman. Pairs: 1, J. Batts; 2, T. A. Cruickshank; 3, P. A. Grosvenor; 4, A. M. Kinsey. Swordtails: 1, T. A. Cruickshank; 2, J. Batts; 3, D. Lyne; 4, J. Keeley. Platy: 1, A. M. Kinsey; 2, D. Reilly; 3, D. Schramm; 4, L. G. Little. Molly: 1 and 2, Mrs. D. Cruickshank; 3, J. Batts; 4, J. Stamp. A.O.S. Livebearer: 1, Mrs. D. Cruickshank; 2, Mrs. J. Garrad; 3, Mrs. C. Bowes; 4, L. G. Little. Us, Ub, Ud: 1, Mr. Pinder; 2, R. L. C. Blight; 3, R. Schramm. Ue: 1, 2, 3 and 4, K. C. Speaks. Vb, Vd, Vf: 1, K. C. Speaks; 2 and 4, R. L. C. Blight; 3, K. Dryden. A.O.S. Coldwater: 1, J. Batts; 2, A. Wood; 3, Master M. Ridley; 4, C. Beavis. Breeders (Egglayers): 1, Mr. and Mrs. S. Fagan; 2 and 4, C. Pike; 3, M. Strange. Breeders (Livebearers): 1, L. G. Little; 2 and 3, R. G. Cox; 4, C. Pike. Breeders (Coldwater): 1, C. Beavis.

* * *

THE **Riverside A.S.** was host to the North West London Group in July, which consisted of five other clubs. A quiz, run by Mr. Dobkin, was won by Riverside by a narrow margin. Results of points: Riverside and Independent, 52 points; Hendon, 40 points; Hampstead, 17 points; Hornsey, 5 points. Best Fish of the Show was won by Hendon with a Barb.

* * *

THE lecturer at the August meeting of the **Keighley A.S.** was Mr. Prince, the Waterboard chemist, who gave a very interesting lecture on water and discussed the different types in local areas. Table Show winners: Fish of the Month —Barbs: 1, Mrs. Taylor; 2, Mr. Bottomsley; 3, Master Mosley. A.O.V.: 1, J. Mosley; 2, Master Illingworth; 3, Master Mosley. Novice A.O.V.: 1, Master Mosley; 2, Mr. Hart; 3, J. Mosley. Junior A.V.: 1 and 2, Master Beckett; 3, Master Mosley.

* * *

AT the July meeting of the **Gloucester Fishkeeping and Social Club**, the club treasurer and show secretary, Tom Collier, gave a demonstration on the art of making all-glass aquariums by using a rubber silicone solution.

The chairman, Mr. R. B. H. Moulder, welcomed the new members present and a vote of thanks was recceded to all those who had assisted with the club's display stand at the Gloucester Carnival Exhibition. A raffle, which had been organised in conjunction with the display had been a tremendous success. The draw was made by Miss Gloucester 1971 and the winner of the spring visit for two people to the tulip fields in Holland was a Mr. A. Eyre of Hucclecote. Miss Carol Pinkney, one of the youngest members of the club, presented Miss Gloucester with a bouquet of red roses.

The club meets at the above venue on the last Wednesday of every month at 7.30 p.m. Any person who may be interested in the activities of the club are cordially invited to come along to any of the meetings without obligation.

* * *

MEMBERS of the south western group of the **B.M.A.A.** held a deep water rally off Berry Head, Brixham on Sunday, 1st August. Co-operating with the members were divers and divers boats of the Brixham Sub Aqua Club.

Although conditions weather-wise were far from ideal the outing, the first of its kind, was successful. The divers did an excellent job foraging the sea bed for specimens and these were brought to the members boats to study keep or return to the sea. A few of the items brought up by the divers were: Sponges—Sycon ciliaton, Geodia mueller, and Halichondria panicea. Tube worms—Serpula vermicularis, Spriographis spallanzari, and Sabella pavonina. Several varieties of Crabs including some nice species of Hermit Crabs (Eupagurus bernardus). Among the shellfish were the Great Scallop (Pecrin maximus) and Queen Scallop (Chlamys opercularis). Among the many Star Fish were some hard to come by Feather Stars (Antedon mediterranea). Several members in the boats fished with baited drop nets, but only had limited successes producing a few Gobies and Wrasses some of these being too big to keep and were put back.

The divers were as enthusiastic about the expedition as the marine Aquarists. J. Farr who organised the divers said he hoped that from this little beginning more divers would co-operate with marine aquarists, so that the hobby of Sub Aqua diving could add an interesting branch of knowledge to their hobby.

THE Teesside Agricultural Show Aquarist section organised by the **Cleveland A.S.** was held under canvas at Middlesbeough. Although the classes were restricted to ten classes there were 185 enteies. Wieners: AV Guppy: Mr. Gray (Mount Pleasent). AV Livebearer: Mr. and Mrs. Enright (Houghton). AV Cichlid: Mr. and Mrs. Enright (Houghton). AV Characin: Mr. Sonley (Ind.). AV Barb: Mr. and Mrs. Attwell (Billingham). AV Anabantid: Mr. and Mrs. Low (Cleveland). E.L.T.C.: Mr. Sonley (Ind.). Catfish and Loaches: Mr. Greenly (Stockton). AOV: Mr. Douglas (Hull). Furnished Jars: Mr. Bailey (Sunderland). Best Fish in Show: Mr. Gray (Guppy).

* * *

RESULTS of **Hoylake A.S.** second open show were as follow: Guppies: 1, Mr. and Mrs. Warburton (Heywood); 2 and 3, Mrs. J. Shackleton (Belle Vue). Mollies: 1, B. Lewis (Merseyside); 2, B. W. Carter (Merseyside); 3, Mr. and Mrs. Riseley (Ashton-under-Lyne). Swords: 1, P. M. J. Lunt (Merseyside); 2, Mr. and Mrs. Riseley (Ashton-under-Lyne); 3, L. Derbyshire (Runcorn). Platies: 1 and 2, Mr. and Mrs. Riseley (Ashton-under-Lyne); 3, Mr. and Mrs. Ormesher (Sandgrounders). Fighters: 1, Mr. and Mrs. Cobb (Belle Vue); 2 and 3, P. Shackleton (Belle Vue). AOV Anabantids: 1, J. Hibbert (Hoylake); 2, Mrs. Shackleton (Belle Vue); 3, Mr. and Mrs. Cobb (Belle Vue). Small Barbs: 1, C. Bowyer (Chester); 2, N. Peterson (Merseyside); 3, Mr. and Mrs. Cobb (Belle Vue). Large Barbs: 1, N. Peterson (Merseyside); 2, A. J. Bland (Hoylake). Dwarf Cichlids: 1, W. Smith (Merseyside); 2, N. Peterson (Merseyside); 3, A. J. Bland (Hoylake). Large Cichlids: 1, Mr. and Mrs. Cobb (Belle Vue); 2, Mr. and Mrs. Brearley (Belle Vue); 3, H. Kitchen (Hoylake). Small Characins: 1, N. Peterson (Merseyside); 2, K. Callow (Belle Vue); 3, Mr. and Mrs. Cobb (Belle Vue). Large Characins: 1, A. Lomas (Merseyside); 2, W. Smith (Merseyside); 3, J. Cobb (Merseyside). Rasboras and Danios: 1,&Mr. and Mrs. Ross (Belle Vue); 2, Mr. and Mrs. Heap (Belle Vue); 3, A. Lomas (Merseyside). Flying Foxes and Sharks: 1, Mrs. W. Heap (Belle Vue); 2, N. Petersen (Merseyside); 3, J. H. Terry (Hoylake). Corydoras: 1, R. Davies (Belle Vue); 2, Mr. and Mrs. Cobb (Belle Vue); 3, D. Walker (Runcorn). Loaches and Botias: 1 and 2, J. Cobb (Merseyside); 3, N. Petersen (Merseyside). AOV Cats: 1, T. Wayles (Hoylake); 2, R. Davies (Belle Vue); 3, Mr. and Mrs. F. Dean (Ellesmere Port). Pairs (Livebearers): 1, Mrs. W. Heap (Belle Vue); 2, Mr. and Mrs. Ormesher (Sandgrounders); 3, Mrs. M. Corns (Heywood). Pairs (Egglayers): 1 and 3, Mr. and Mrs. Faulkner (Merseyside); 2, P. and J. Taylor (Heywood). Breeders (Egglayers): 1, J. H. Terry (Hoylake); 2, W. V. Gee (Ellesmere Port). Juniors (Livebearers): 1, P. Bates (Belle Vue); 2, M. J. Dean (Ellesmere Port); 3, L. P. A. Corns (Heywood). Junior (Egglayers): 1, Miss A. Davies (Belle Vue); 2, Miss S. Rowlands (Hoylake); 3, M. T. Dean (Ellesmere Port). AOV Coldwater: 1, Mr. and Mrs. Brearley (Belle Vue); 2, W. Smith (Merseyside); 3, Mr. and Mrs. Cobb (Belle Vue). AOV Tropical: 1, C. Bowyer (Chester); 2, Mrs. W. Heap (Belle Vue); 3, B. Lewis (Merseyside). Best Fish in Show: C. Bowyer (Chester) 88 pts.—Siamese Tiger.

* * *

MEMBERS of **Sherwood A.S.** have had three home inter-society competitions this year. They had wins over Alfreton and District A.S., Worksop A. and Z.S. and held Dukeries A.S. to a draw in the first leg of the competitions. Sherwood is a small active society and since it was founded in May last year it has had one of the best attended open shows in the country and has won ten best fish in show awards. The society wishes to thank the following members for gaining these awards, through their dedication to the breeding and showing of fish: B. Blackburn; Mrs. M. Igoe; J. Igoe; and D. Sewell.

THE poor attendance at meetings in July and August of the **Yarmouth A.S.** was attributed mainly to the holiday season. The Society's visit to the Alexandra Palace Exhibition was enjoyed by all who went. Spending his holidays in Yarmouth was R. Holmes of Derby A.S. who came to the August meeting. He judged the table show and his added comments on why he favoured some fish as opposed to others was of benefit to all members. Mr. Holmes also gave the Society a talk on his experience in fishkeeping. The meetings are held on the first Monday of each month at the St. Johns Ambulance Rooms, Northgate Street, Gt. Yarmouth at 7.30 p.m.

* * *

OPEN Show results of the **Oldham and District A.S.** were as follow: Best Fish of Show: K. Parkes (Merseyside). Guppies: 1, H. Baldwin (F.G.A.); 2, W. Bastow (Castleford); 3, P. Wilson (Independent). Mollies: 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, J. Abbot (Horsforth); 3, Mr. and Mrs. Pearson (Sunnybrow). Swordtails: 1, Mr. and Mrs. Cohen (Castleford); 2 and 3, N. R. Gibson (Huddersfield). Platies: 1, Mrs. Davies (Privateers); 2, J. S. Hall (Aireborough); 3, Mr. and Mrs. Risley (Ashton-u-Lyne). Anabantids: 1, Mr. and Mrs. Cohen (Castleford); 2, B. Dawson (Middleton); 3, F. Mulla (Merseyside). Fighters: 1, 2 and 3, Mrs. and Mrs. Cohen (Castleford). Small Barbs: 1, 2 and 3, F. E. Gregory (Oldham). Large Barbs: 1, R. Bowling (Sunnybrow); 2, G. Wilkinson (Hyde); 3, Mr. and Mrs. Grimshaw (Sunnybrow). Small Cichlids: 1, Mr. Goodman (Middleton); 2, Mr. Charlton (Merseyside); 3, K. Stafford (Oldham). Large Cichlids: 1, Mr. and Mrs. Wilkes (Middleton); 2, Master P. Ashton (Middleton); 3, Mr. and Mrs. Gates (Castleford). Angels: 1, N. R. Gibson (Huddersfield); 2, Mr. Charlton (Merseyside). Small Characins: 1, Mr. and Mrs. Gates (Castleford); 2, G. Thickbroom (Castleford); 3, M. Tonge (Oldham). Large Characins: 1, K. Parkes (Merseyside); 2, G. Thickbroom (Castleford); 3, M. Tonge (Oldham). Rasboras: 1, Mr. Charlton (Merseyside); 2, Mr. Mellalieu (Independent); 3, Mr. and Mrs. Wilkes (Middleton). Danios and Minnows: 1, Mr. and Mrs. Cohen (Castleford); 2, K. Stafford (Oldham); 3, T. Hunt (Stretford). Sharks and Foxes: 1 and 2, Mr. Charlton (Merseyside); 3, Mr. and Mrs. Gates (Castleford). Tooth Carps: 1, B. R. Forrester (B.K.A.); 2, E. Smith (Sheffield); 3, M. Tonge (Oldham). Corydoras Catfish: 1, M. Buxton (Sheffield); 2, Mr. and Mrs. Grimshaw (Sunnybrow); 3, Mr. and Mrs. Gates (Castleford). A.O.V. Catfish: 1, Mr. and Mrs. Risley (Ashton-u-Lyne); 2, Mr. and Mrs. Wilkes (Middleton); 3, G. Thickbroom (Castleford). Loaches: 1, F. Mulla (Merseyside); 2, G. Gillespie (Castleford); 3, N. R. Gibson (Huddersfield). Breeders (Egglayers): 1, J. Higgins (Oldham); 2, F. E. Gregory (Oldham); 3, Mr. and Mrs. Pearson (Sunnybrow). Breeders (Livebearers): 1, Mr. and Mrs. Cohen (Castleford); 2, N. R. Gibson (Huddersfield); 3, G. Thickbroom (Castleford). Pairs (Egglayers): 1, Mr. and Mrs. Grimshaw (Sunnybrow); 2, Mr. Charlton (Merseyside); 3, D. Higgins (Oldham). Pairs (Livebearers): 1, G. Stewart (Hyde); 2, D. Godbehere (Stocksbridge); 3, Mr. Charlton (Merseyside). Fancy Goldfish: 1 and 3, S. Walsh (Accrington); 2, J. S. Hall (Aireborough). Goldfish Common: 1, Mr. Whitsey (Accrington); 2, Mr. and Mrs. Toyne (Sheffield); 3, J. S. Hall (Aireborough). A.O.V. Coldwater: 1, G. Thickbroom (Castleford); 2 and 3, S. Walsh (Accrington). A.O.V. Tropical: 1, K. Parkes (Merseyside); 2, T. Hunt (Stretford); 3, P. Rogers (Stretford). Mini Jars: 1, E. Birchwood (Oldham); 2, B. Robinson (Huddersfield); 3, J. Higgins (Oldham).

* * *

NEWS from the **Elliott A.S.** gives the election of officers at the annual general meeting. Chairman: S. Andrews; secretary, E. G. Woods, 30 Frittenden Road, Wainscott, Rochester; treasurer, G. Smith; show secretary, I. Lake; other members, A. Reeves, A. Tanner, G. Hollands, P. Goodearl; show committee members, A. Hambleit, C. Marsh; F.B.A.S. representative, A. Clack.

The society meet every other Tuesday at the Amalgamation Club Room, Station Road, Strood, Kent, commencing at 8 p.m. and at these meetings there is either a speaker or a film or tape/slide show. There is also a Table Show at each meeting. A trip to London Zoo Aquarium has been arranged for the 24th October. An open invitation is extended to all other aquarists to attend any of the meetings if they either live in or are visiting the area at any time.

* * *

THE **Kingston and District A.S.** are preparing for their annual Open Show on 16th October (see Aquarist Calendar for address) and are very pleased to welcome and share the occasion with the South Park Aquatic Study Society as participants in a combined effort. S.P.A.S.S. will be exhibiting many coldwater species particularly those rare varieties of Goldfish plus other fish not necessarily indigenous to tropical waters. Both Societies anticipate a record number of entries this year and a report and results will be published in the December *Aquarist*.

* * *

MR. R. JOHNSON, chairman of the **Mid Sussex A.S.**, warmly welcomed the president, T. Croucher and his wife, to the monthly meeting in August. This year, the Society is holding a Children's Christmas Party on the 11th December. Anyone able to help with the catering should contact D. Soper (Burgess Hill 2251). N. Short of Nero Aquatics, Haywards Heath and a Society committee member, gave an illustrated lecture on construction of garden ponds. C. A. T. Brown (F.B.A.S.) judged the Table Show for Characins and Catfish. The prizes were awarded as follow: Characins: 1, N. Bridle; 2 and 4, B. Slade; 3, J. Walker; 5, A. Jackson. Highest Junior: P. Ratcliffe. Tropical Catfish: 1, 2 and 5, C. Corbin; 3, D. Soper; 4, C. West; Highest Novice: Mrs. Stringer. Tropical Catfish: 1, A. Temple; 2, Mrs. Stringer; 3, P. Ratcliffe; 4, D. Soper; 5, C. West. Junior Back awards: D. Ransom (Sexed pairs, Livebearers. Male Guppy). L. Temple (Sexed pairs, Livebearers). P. Ratcliffe (Coldwater). T. Bridle (A.O.V.). Any further information on the Society may be obtained from the secretary, J. Reeve, 36 Rumbolds Lane, Haywards Heath 3702 (evenings only).

* * *

RESULTS of the fifth Annual Open Show were as follow: Guppies (Male): 1, 3 and 4, Mrs W. Burton (Trowbridge); 2, G. Ball (Bath). Guppies (Female): 1, C. Rossiter (Gloucester); 2, P. A. Lewis (Bristol Trop.); 3, T. Hayward (Y.A.D.S.); 4, Miss L. Smith (Y.A.D.S.). Swordtails: 1, S. Daniels (Bath); 2, A. Higgs (Gloucester); 3, G. Furber (Bristol Trop.); 4, C. Russell (Bath). Mollies: 1, D. Sullivan (Bath), 2; D. Hodge (Bath); 3, S. Daniels (Bath); 4, Mr. Dolling. Platies: 1 and 4, Mrs. W. Short (Bath); 2, D. Carey (Bath); 3, Mr. Pomford (Bath). Barbs Named: 1, D. Noble (Y.A.D.S.); 2 and 3, J. Powell (Y.A.D.S.); 4, R. Adams (Y.A.D.S.). Barbs (A.O.V.): 1, 2 and 4, A. Hillcard (Bath); 3, Mr. Hyett (Bath). Danios, Rasboras and Minnows: 1, G. Furber (Bristol Trop.); 2, D. Walsh (Y.A.D.S.); 3, R. Harvey (Keynsham); 4, Mrs. M. Butcher (Trowbridge). Characins, H. & H.: 1, 2 and 4, D. Noble (Y.A.D.S.); 3, S. Daniels (Bath). Characins A.O.V.: 1, Mrs Daniels (Bath); 2, R. Bennett (Y.A.D.S.); 3, R. Harvey (Keynsham); 4, IR. Lunt (Bath). Anabantids: 1, R. Harvey (Keynsham); 2, C. Phipps (Bath); 3, S. Green (Y.A.D.S.); 4, C. Stickland, (Y.A.D.S.). Siamese Fighters: 1 and 3, S. Daniels (Bath); 2, R. Harvey (Keynsham); 4, Mrs. W. Burton (Trowbridge). Angels: 1, S. Hampshire (Y.A.D.S.); 2, P. Hampshire (Y.A.D.S.); 3, J. Rymill (Y.A.D.S.); 4, B. Webb (Bath). Cichlids (A.O.V.): 1, J. Roberts (Bath); 2, S. Green (Y.A.D.S.); 3, P. Hiscock (Y.A.D.S.) 4, R. Adams (Y.A.D.S.). Dwarf Cichlids: 1, M. Butcher (Trowbridge); 2, R. Lawrence (Bristol Trop.); 3 and 4, R. Bennett (Y.A.D.S.). Corydoras: 1, P. A. Lewis (Bristol Trop.); 2, D. Phippen (Bath); 3, Mr. Pomford (Bath); 4, R. Lawrence (Bristol Trop). Catfish A.O.V.: 1, D. Noble (Y.A.D.S.); 2, S. Daniels (Bath); 3, S. Green (Y.A.D.S.); 4, J. Powell (Y.A.D.S.). Sharks, Eels and Botias: 1, A. Hillcard (Bath); 2, P. A. Lewis (Bristol Trop.); 3, G. Davies (Y.A.D.S.); 4, R. Harvey (Keynsham). A.V. Sexed Pairs: 1, Mr. Pomford (Bath); 2, C. Stickland (Y.A.D.S.); 3, C. Russell (Y.A.D.S.); 4, P. A. Lewis (Bristol Trop.). Breeders (Livebearers): 1, Mrs .W. Short (Bath); 2, C. Phipps (Bath); 3 and 4, J. Powell (Y.A.D.S.). Breeders (Egglayers): 1, M. Butcher (Trowbridge); 2, C. Russell (Bath); 3 and 4, Mr. Hyett (Bath). Killifish: 1 and 3, R. Lawrence (Bristol Trop.); 2, R. Bennett (Y.A.D.S.); 4, Mr. Smith (Bath). A.O.V. Tropical: 1, Mr. Pomford (Bath); 2 and 3, C. Russell (Bath); 4, R. Harvey (Keynsham). Goldfish: 1, T. Hampshire (Y.A.D.S.); 2, 3 and 4, L. Menhinnick (New Forest). Shubunkins and Fancy Goldfish: 1, K. Daniels (Bath); 2, J. Ball (Bath). A.V. Pond and River Fish: 1, R. Watts; 2 and 4, Mr. Wood (Gloucester); 3, T. Hayward (Y.A.D.S.). Junior Any Variety: 1, D. Sullivan (Bath); 2, T. Hayward (Y.A.D.S.); 3, T. Sullivan (Bath); 4, C. Bull (Trowbridge). Furnished Jars: 1 and 4, R. Bishop (Y.A.D.S.); 2, J. Rymell (Y.A.D.S.); 3, D. Hodge.

* * *

A summary of activities of the **Brighton and Southern A.S.** showed that the Club is expanding rapidly and more new members joined the ranks this past period. Club activities in June included a lecture on plants by Mr. Ron Feeder and this proved to be tremendously popular and informative as was emphasised by the lively discussion period. The Club also staged a Table Show for Toothcarps and Guppies with a Plant show in support. The standard of the Guppies was not good and this led to one of the most entertaining evenings involving the Judge, Mr. P. Ginger, with the local F.G.A. Judge, Mr. David Soper, who discussed the tail shapes etc., of Guppies according to F.G.A. Standards.

One important Committee change has taken place in that, due to ill health Mr. Bert Shelton has retired as Secretary and all wish him a speedy full recovery. The new Secretary is Mr. M. Whittington, 408 Portland Road, Hove, Sussex.

* * *

EARLY in August the **Bracknell A.S.** had a visit from an old friend, P. Ginger of Uxbridge A.S., who gave a very descriptive talk on Barbs. The Table Show was for Danios and Minnows. The results being as follow: 1, G. Carter; 2, and 3, M. Carter. A.O.S.: 1 and 3, J. Ridley; 2, T. Berryman.

At the second meeting in August the Society were hosts to fellow-member Clubs of The Three Counties Group for the Fish League. The results were as follow; Individual Best Fish in Show: 1, R. Ilsley (Basingstoke); 2, A. Blake (Basingstoke); 3, M. Strange (Basingstoke). Breeders: 1, D. Ridley (Basingstoke); 2, R. Armstrong (Bracknell); 3, M. Davies (Reading); 4, O. Lesley (High Wycombe). Teams: 1, Basingstoke; 2, High Wycombe; 3, Bracknell; 4, Reading; 5, Didcot.

* * *

A TOTAL of 480 entries were benched at the annual Open Show of **Riverside A.S.** The results were as follow: Individual Furnished Aquaria: 1 and 2, M. Goss (Riverside); 3, J. Batts (Ealing). Barbs: 1, B. Cowell (Bethnal Green); 2, B. Furnell (Uxbridge); 3, P. Beenchley (E. Dulwich); 4, A. Marshall (Basingstoke). Characins: 1, S. Cowell (Bethnal Green); 2, J. Batts (Ealing); 3, B. Busson (Basingstoke); 4, B. Cowell (Bethnal Green). Angels: 1, J. Batts (Ealing); 2, D. Dare (Walthamstow); 3, J. Howe (Anson); 4, M. Nethersall (Riverside). Dwarf Cichlids: 1, J. Batts (Ealing); 2 and 3, A. Blake (Basingstoke); 4, M. Strange (Basingstoke). Cichlids: 1, M. Strange (Basingstoke); 2, A. M. Kinsey (Independent); 3, J. Healry (Ealing); 4, M. Nethersall (Riverside). Labyrinths: 1, S. Cowell (Bethnal Green); 2, G. Greenhalf (Kingston); 3, J. Hughes (Roehampton); 4, P. Sawford (Kingston). Egglaying Toothcarps: 1 and 3, T. W. Glass (Hendon); 2, R. Wright (E. Dulwich); 4, P. Lambourne (Roehampton). Tropical Catfish: 1 and 2, G. Greenhalf (Kingston); 3, A. Kinsey (Independent); 4, D. King (Kingston). Corydoras: 1 and 4, R. Wright (E. Dulwich); 2, G. Greenhalf (Kingston);

3, D. Reilly (Anson). Rasbora: 1, K. Barrett (Kingston); 2, P. Maslin (Riverside); 3, Mr. and Mrs. P. Hudson (Roehampton); 4, B. Bissoon (Basingstoke). Danio and W.C.M.M.: 1, K. Quennell (E. Dulwich); 2, G. Carter (Bracknell); 3, A. Blake (Basingstoke); 4, P. Maslin (Riverside). Loaches: 1, Mrs. P. Lambourne (Roehampton); 2, M. Carter (Bracknell); 3, A. Wood (Anson); 4, L. Garrad (Runnymede). A.O.S. Tropical Egglayer: 1, J. Batts (Ealing); 2, I. Strange (Basingstoke); 3, T. Berryman (Bracknell); 4, J. Howe (Anson). Guppy Male: 1, Mrs. P. Sawford (Kingston); 2, J. Howe (Anson); 3 and 4, M. Nethersall (Riverside). Guppy Female: 1, D. Baggot (Anson); 2, J. Gorvett (Roehampton); 3, M. Nethersall (Riverside); 4, J. Batts (Ealing). Swordtail: 1, T. Lecvirot (Roehampton); 2, J. Healry (Ealing); 3, G. Greenhalf (Kingston); 4, D. Lyne (High Wycombe). Platys: 1, A. Blake (Basingstoke); 2, B. Bissoon (Basingstoke); 3, K. Quennell (E. Dulwich); 4, D. Cruickshank (Kingston). Mollys: 1, J. Batts (Ealing); 2, S. Cowell (Bethnal Green); 3, B. Furnell (Uxbridge); 4, D. King (Kingston). A.O.S. Livebearers: 1, B. Furnell (Uxbridge); 2, M. Strange (Basingstoke); 3, J. Batts (Ealing); 4, D. Cruickshank (Kingston). Single-tailed Goldfish: 1 and 2, V. P. Voysey (Salisbury); 3, K. Hudson (Roehampton); 4, V Thompson (Roehampton). Twintail Goldfish: 1, A. Marshall (Basingstoke); 2, B. Burke (Riverside); 3, Mrs. P. Lambourne (Roehampton). A.O.S. Coldwater: 1 and 2, V. P. Voysey (Salisbury); 3, J. Hughes (Roehampton); 4, E. Binstead (Portsmouth). Breeders Egglayers: 1, Mr. and Mrs. Fagan (Clapham); 2 and 4, R. Newman (Uxbridge); 3, K. Barrett (Kingston). Breeders Livebearers: 1, D. Lyne (High Wycombe); 2, D. Barrett (Kingston); 3, A. Blake (Basingstoke); 4, R. G. Cox (High Wycombe). Plants: 1 and 2, M. Goss (Riverside); 3 and 4, D. Dare (Walthamstow). Best Fish of the Show: Mosquito, B. Furnell (Uxbridge).

* * *

A VERY successful show and exhibition was staged by the **Leicester A.S.** recently. The winners were as follow: Coldwater Furnished Aquaria: 1, C. Cartwright; 2, H. Brakes; 3, N. Giles; H/Com., D. Harding. Tropical Furnished Aquaria: 1, Mrs. A. Walker; 2, C. Cartwright; 3, D. Harding; H/Com., M. Witham. Junior Section: Coldwater: Ian Robertson, also Best Fish in Coldwater Section: Tropical: 1, T. White; 2, J. Giles; 3, I. Robertson. Best Fish in Show: Tropical: R. Lewis; Coldwater; I. Robertson. Best Plant in Show: C. Cartwright. Breeders Class: Coldwater: 1, H. Brakes; 2, D. Harding. Tropical: 1, 2 and 3, C. Cartwright; H/Com., Mr. Pepper. Result of Home Aquaria and Pond Competitions held during June and July: 1, Mrs. Hextall; 2, Mr. Harris; 3, Mr. Pepper. Pond: 1, B. Payne 2, C. Cartwright; 3, Mrs. Hextall. On Thursday, 7th October, the Society have invited both Bedworth and Loughborough Societies to come along. P. Bird from St. Albans will be the speaker on this occasion. An inter-Society table show will be staged and there will be four classes: Barbs, Characins, A.V. of Pairs, and Catfish and Loaches.

* * *

THE **Suffolk Aquarist and Pondkeepers Association** held their monthly meeting in August, when a general discussion on colour fish 71 took place which will be held in October. Winners of the Table Show were as follow: Coldwater: 1, Mr. Clark; 2, Mr. Stock; 3 and 4, Master Clark. Tropical: 1 and 2, Mr. Jermy; 3, Mr. Crown; 4, Mr. Richardson.

DURING August members of the **Merseyside A.S.** were treated to a most unusual evening's entertainment. Trader-member Len Thomas, of Wirral Pets Limited, talked on the subject of importing and wholesaling tropical freshwater and marine fishes. Having told of the many snags and hazards involved, he showed an excellent cine film which he has made showing the background to the arrival of the fishes at the airport and following through to the unpacking and housing of the fishes in his quarantine tanks. Earlier in the month Ken Parkes talked about equipment, kindly loaned by trader member Eddie Pillinger. As each item was shown, discussion between members argued its good points and its bad. Even the most expensive and sophisticated equipment came in for criticism from one member or another, a fact which might give manufacturers food for thought.

* * *

AT the August main meeting of the **Bradford and District A.S.** the speaker was Mr. Winterburn, the subject of his talk being cultivating plants for the aquarium. Mr. Winterburn's vast experience of this part of the hobby was passed on to those present in a way that all could understand. The attendance at the Discussion Evening was poor, probably due to the holidays. Those who were in attendance were given cuttings of a very quick growing plant and live food cultures by our speaker, A. Daughtery. His talk covered a large number of subjects from the range of our aquarium fish, to showing two pieces of wood that he hoped to use in his aquarium; he told members where he found these and how to get to the spot.

* *

NEW SOCIETY

A new society has been formed in Honiton and meets fortnightly at 8 p.m. at the Kings Arms, Honiton. The title is the **Honiton and District A.S.** (Sidmouth and Otnery St. Mary) and the Secretary is S. Richardson, 12 Jerviard Crescent, Honiton.

* * *

SECRETARY CHANGES

British Cichlid Association: David Attwell, 103 Jossey Lane, Scawthorpe, Doncaster, Yorkshire.

Holyhead and District A.S.: Mrs. B. J. Farlow is no longer the Secretary of this society, and clubs are requested to alter their records accordingly.

Kings Lynn A.S.: B. Capper, 15 Marsh Lane, Kings Lynn.

Ashton-under-Lyne and District A.S.: The new Show Secretary is J. Eyres, 6 Grasmere Grove, Ashton-under-Lyne, Lancs.

* * *

CHANGE OF VENUE

Torbay A.S. now meets on alternate Wednesdays at 8 p.m. at The Cine Club, Winner Hill Road, Paignton.

* * *

AQUARIST CALENDAR 1971

2nd October: 25th Annual Open Breeders Show, East London. Aquarist and P.A. Judges: C. A. T. Brown, B. Baker, F. Tomkins. Schedules available F. Vicker, 13 Irons Way, Romford, Essex.

3rd October: Ealing A.S. Open Show at Northfields Community Centre, Northcroft Road, London, W.13. Schedules are now available from the Show Secretary, R. Sellers 3a Lady Margaret Road, Southall, Middlesex.

3rd October: Hetton County A.S. annual Open Show at Sherburn Hill Community Centre, Sherburn Hill, nr. Durham City, Co. Durham. Details from Mrs. C. Wilkinson, c/o County Aquatics, Front Street, Hetton-le-Hole, Co. Durham.

8th October: North Kent A.S. Inter-Club Show at the Sweyne School, Swanscombe, Kent. Details from A. Cox, 35 Bridge Road, Slade Green.

9th-10th October: British Aquarists' Festival, Zoological Gardens, Belle Vue, Manchester.

10th October: Reigate and Redhill Aquarist Society fourth annual open show at Old Reigatians Rugby Club, Park Lane, Reigate. Schedules from Show Secretary, J. Wood, 22 Rickman Hill, Coulsdon, Surrey.

16th October: Kingston and District A.S. and S.P.A.S.S. annual open show at Territorial Army Centre, Farringdon House, Stonecott Hill, Mordon, Surrey. Schedules from G. Greenhalf, 39 Garth Close, Morden, Surrey.

17th October: Suffolk Aquarist and Pondkeepers Association *Colour Fish 71*. An Exhibition of Tropical and Coldwater Fish at the Suffolk Show ground, Bucklesham Road, Ipswich. Trades Stands.

17th October: Sherwood A.S. Second Open Show. Show Secretary, D. Birkbeck, 173 Peter Smith Drive, New Ollerton, Notts.

17th October: Sherwood A.S. Second Open Show. Venue—Thoresby Miners' Welfare Hall, Edwinstowe, Nr. Ollerton, Mansfield, Notts. Schedules available from Show Secretary, J. Igoe, 25 Marples Avenue, Mansfield Woodhouse, Notts.

23rd October: Catford Open Show. Schedules from show secretary, J. D. Wilson, 130 Paston Crescent, Lee, London, S.E.12.

24th October: Doncaster and District A.S. Second Open Show to be held at the T.A. Barracks, Sandford Rd., Balby.

30th October: Kings Lynn Aquarium Society —first open show—schedules from B. Capper, 15 Marsh Lane, Kings Lynn.

31st October: Buxton and District A.S. first Open Show will be held at the St. Thomas Moore School, Palace Road, Buxton. Details from Secretary, J. A. Snadden, "Rosedale," 29 Dale Road, Dove Holes, Buxton, Derbyshire.

31st October: Halifax A.S. Tenth Annual Open Show at Standeven House, Broomfield Avenue, Halifax. Show Secretary, J. Grundy, 19 Tower Gardens, Wakefield Grate, Halifax.

7th November: Mixenden Tropical Fish Societies Open Show will be held at the Mixenden Community Centre, Clough Lane, Mixenden, Halifax. All enquiries to S. Leedham, 74 Clough Lane, Mixenden. Halifax. Yorks.

13th November: A meeting of the British Cichlid Association (Northern Area) will be held at Ashgate Rise, Raw Gap, Knaresborough, Yorks., at 7.30 p.m. All details from D. Taylor at the above address.

14th November: Horsforth A.S. Third Open Show. Further details later.

20th November, 6 p.m.: Hendon and District A.S. Annual Congress at Whitefields School, Claremont Road, London, N.W.2. Speaker: Mr. A. Fraser-Brunner. Details and tickets from R. J. Deacon, 88 Cotswold Gardens, London, N.W.2.

21st November: Castleford and District A.S. Annual Open Show at Castleford Secondary Modern Boys' School, Castleford, Yorks. Details from Secretary, Mr. Eyre, 41 Leatham Crescent, Purston, Featherstone, Yorks.

THE BRITISH AQUARISTS' FESTIVAL,

will be held this year at Belle Vue Zoological Gardens Manchester on

SATURDAY 9th OCTOBER and SUNDAY 10th OCTOBER