

The Aquarist

and Pondkeeper

JULY 1966



MONTHLY
Vol. XXXI No. 4

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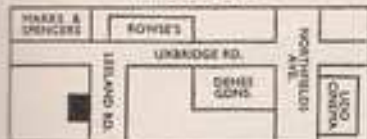
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Special News

See Page ix



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Correspondence with intending contributors is welcomed.

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The Editor accepts no responsibility for views expressed by contributors.

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OUR COVER

Stenotomella maculata. A spiny eel from Thailand. A shy fish which thrives under aquarium conditions so long as it has sufficient stones and rocks behind or under which it can hide itself.

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1966

The Bloodfin

by MICHAEL M. CLARK

THE bloodfin (*Aphyoseanx rubripinnis*) is a member of the family of characins. It appears both lively and hardy and, in suitable surroundings, it is outstandingly attractive. The body colour of the fish is a translucent creamy green, but a blood-red covers the anal, pelvic, dorsal and caudal fins. The anal and pelvic fins also bear a tinge of white at their tips. The black eyes of the fish are comparatively small.

The bloodfin is fairly easy to breed, but distinguishing of the sexes is not easy. The male possesses a small hook on his anal fin but this is barely visible. However, the female should appear deeper bellied than her mate.

The breeding tank, which should measure about 18 by 10 by 12, should be thickly planted with floating fern (*Ceratopteris detroides*) or Indian ferns. The tank temperature should not exceed 80°F. A ready pair will commence spawning in the early hours of the morning after they have been introduced into their new surroundings. For several hours they may be observed to chase each other. Suddenly, they will start leaping out of the water. In the air they come into contact. The female expels a handful of eggs and, at the same time, they are fertilized by her mate. The eggs fall into the water, many being caught on the leaves of plants, while some continue to sink until they settle on the gravel base of the tank.

This action of spawning is repeated many more times. When they have finished spawning, they will both swim separately. Now they should be removed from the tank at once. If they are left it is quite possible that every single egg will be readily devoured by them.

The young fry are born between 24 and 48 hours later. At first they appear barely visible but after four or five days their size may have doubled. At first they should be fed on fine dried foods, *infusoria* and egg yolk. Within nine months they may measure 1½ inches and, at this age, they will reproduce readily.

Fishes of the Congo (Part 2)

by A. VAN DEN NIEUWENHUIZEN, *Translated by* AL KLEE

IN 1956, Dr. Max Poll of the Congo Museum in Belgium described a new species of *Nothobranchius*, *Nothobranchius brevis*. Some three years later, I received the first eggs of this fish from the Graindorge family in Jadoville and at the same time they furnished the data which was presented in my previous article. These data are, without doubt, exact for they were gathered on their many excursions by the members of the now defunct society in Jadoville, "*Barbus Tetrazina*," said society

having the facilities of a laboratory at their disposal. One of the laboratories of the Union Minière Company analyzed these water samples to add to what was not already known about water composition.

The eggs were sent to me by airmail and I divided the pest with eggs among three wide-mouth dishes. These were eggs from wild-caught specimens that the Graindorge family had bred in their aquarium during the months February and March. In May, when I examined a few



One of the large but rather shallow pools in the swamp. As in many other places in the swamp, the vegetation is here quite thick and dotted with large trees. The overall impression is, therefore, that the swampland is nothing more than a large flat surface overgrown with grasses.



The male of *Nothobranchius guentheri* spawns with a female, the other female pseudospawn with the first male.

egg in the peat, I found them to be in the first stage of development. Only towards the end of the summer did I decide to immerse the peat in water finding nothing noteworthy at the hatching of the young. At first, it seemed that all were "bellysliders" but I was astonished when, after a short while, they all swam normally. They grew successfully, reaching a length of one-half inch after four weeks. This was not out of proportion really for at that time I was not able to offer the foods that I would have liked to have given.

I now had about 60 youngsters which I divided among three rearing tanks, (15 x 10 x 10 inches) in order to minimize the risk of losing my new acquisitions. Nevertheless, I received quite a disappointment in the fifth week when, one after the other, the young began to die and in spite of my efforts they were all dead by the sixth week. Before they died they all exhibited very accelerated breathing and lung at the surface of the water. In brief, it appeared to be precisely the same sort of experience that we have had on occasions with *Nothobranchius guentheri*. The young fish were kept in peat-filtered, crystal-clear water that was at the same time passed through a charcoal filter. One could not, therefore, suggest an excess of CO₂ and since feeding was precise there was no uneaten food left in the tank either. In a short while the fish were dead.

In the meantime, due to the unrest in the Congo, the Gumbonge family returned to Belgium bringing with them additional eggs which they sent to me. This time, things went better as evidenced by the following account. In breeding *Nothobranchius guentheri* one can hatch out young in as little as 6 to 8 weeks although results are better if the peat is held longer. If one examines the eggs of *N. brieni* under a magnifying glass, very little development is seen in this amount of time. This is understandable for the eggs of this species go through a drying period in nature from June to the end of October or the beginning of November; in all about 5 months. After 6 weeks, the development of the eggs is scarcely begun. Moreover,

this species lays a great many "resting eggs"; that is to say that such eggs begin their development very late and remain clear for quite some time. Such eggs are insurance against a premature and short rainy period. They are, in fact, a precautionary measure of nature's. This is, by the way, not unique for the same phenomenon is observed in *N. guentheri*, *N. paluipati*, *N. racheoi* and many bottom spawning Aplocheilichthys and south American annuals. Consequently, we can say that the eggs of *N. brieni* (and *N. racheoi*) require, optimally, a drying period of from 6 to 8 months. It is appropriate now to say something about breeding of *N. brieni* and in general, it will be shown to parallel that of the other species of *Nothobranchius*.

(1). It is best to separate the sexes about a week before breeding and to feed normally. This is to say, alternating with mosquito larvae, well-washed tubifex (not too much at one time), small flies, etc.

(2). Prior to breeding, relatively small tanks may be used. My personal preference is for aquaria measuring 10 x 10 x 10 inches since my breeding tanks are of at least this size. The water height in this breeding tank should be about 4 inches; the water itself well-aged, crystal-clear and either soft or hard. (My experience is that the hardness of the water is not significant.) On the bottom of the tank, place a layer of peat about 1 inch deep. The water temperature should be about 72-75°F.

(3). There are many ways in which the breeding tank can be arranged. In the tank, a refrigerator dish containing a layer of peat moss or a layer of dark nylon wool can be placed. In lieu of other opportunities, the nothos eagerly lay their eggs in this substrate. The advantages of such an arrangement will soon be made apparent.

(4). For breeding, one male and two females are used. After several days, the females may be replaced with fresh,



Eggs of *Nothobranchius brieni* in their third week



Spawning *Nothobranchius palmquisti*

conditioned females so that a high egg production can be maintained. If peat is used in the brooding tank, everything may be poured out (after first removing the fishes of course) into a nylon net of the sort used to collect daphnia and squeezed gently to produce a slightly moist product. This peat is then placed into a plastic bag or a covered container. It is not advisable to store the peat in the breeding tank for not only would this preclude using it for many months but moreover, the peat would dry too fast and too much. The latter especially applies to *N. brieni*. This is rather remarkable since in nature these eggs lie in a substrate during the dry season which is so devoid of moisture that it cracks and runs through with fissures.

(5). The peat containers are best stored in an area where the temperature is kept constant (70 to 73°F). At temperatures between 73 and 80°F, my experience is that most eggs go bad. During the long incubation period it is advisable to ventilate the area in which the eggs are stored in their sealed packages. If this is not done, there is a tendency for mould to form, something which is very undesirable.

(6). After the drying period is at an end, return the eggs to a breeding tank and flood them with water. With *N. brieni*, high water levels are not recommended. Many hobbyists complain of bellysliders. At first, I could not explain this or why it happened again and again until one day I sat down and observed the fry hatching from the eggs. The water level in the tank stood at 6 inches. Within the hour, the first fry hatched out and I discovered in general, all were bellysliders. At the same time, it was noticed that all of the fry attempted to reach the surface of the water. Not succeeding in this, they swam in a skipping motion throughout the water. When I lowered the water level to

1½ inches their conduct changed. All of the "bellysliders" swam naturally. Probably air is taken at the water's surface to fill their swimbladders. This has not only been my own, but the experience of many other hobbyists.

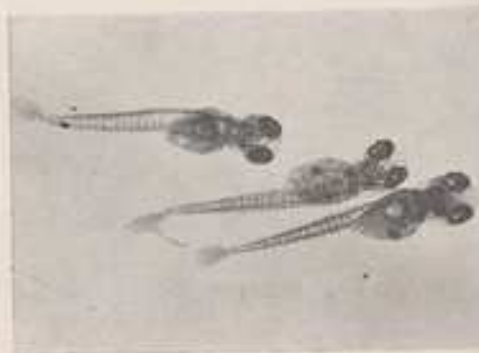
(7). Before flooding the eggs, a brine shrimp culture should be started in order to feed the fry immediately after they are free-swimming, for they take food right in the first hours after hatching.

(8). *Nothobranchius brieni* grows very fast. In the Congo, they reach full growth about 55 days after the start of the rainy season. With good feeding, they reach a length of 1½ inches after two weeks under aquarium conditions. On the third day one can even feed sifted daphnia; later on, larger foods are given. Moreover they grow so rapidly that they should be transferred to larger quarters.

(9). Frequently, these fishes are burdened with parasites. Primarily *Oodinium* (velvet) is found about the borders of the scales. This disease is contagious but in spite of the great danger, I have never lost many fishes from it. Remarkably the disease can even appear in the relatively clean hatching tank. Many hobbyists are of the opinion that many diverse species of *Nothobranchius* are infected at birth.

Finally, it has been shown that high water temperatures are injurious to this fish. It cannot be emphasized enough that temperatures above 80°F coupled with extensive feeding of but a single food often results in a dropy-like condition. In my next article, I shall describe other things, the advantages of using refrigerator dishes containing nylon mops (mentioned previously), and also the living conditions of other Katanga and neighbouring species.

(to be continued)



Newly hatched fry of *N. brieni*

Insect Individualists:

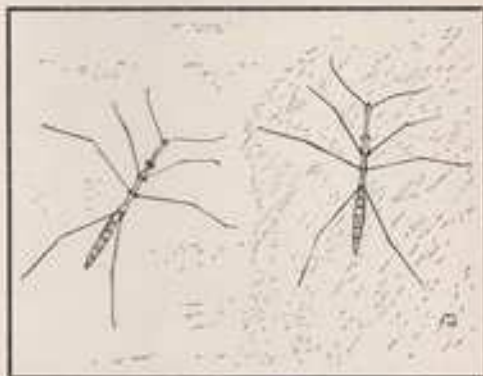
Hydrometra—the Water Measurer

by F. WILMOT

THE tiny Water Measurer or Water Gnat (*Hydrometra*) is a creature both of the surface-film—the thin covering which is a natural property of all surface water—and the damp parts around the margins of ponds. Like the Pond Skater (*Gerris*), as it moves over the rubber-like surface-film its feet merely make little dents and do not become immersed. But unlike the Pond Skater it never ventures below the surface, neither does it run or jump. For it can manage nothing more with its long hair-like legs than a slow and laborious walk—a thing more uncommon in insects. Indeed it is difficult to imagine, if the Water Measurer did somehow become immersed, how it would succeed in getting back through the underside of the surface-film.

I remember that on the occasion when I first saw *Hydrometra* walking slowly on the surface of a pond, I thought it must be either injured or affected by cold. Certainly, with its thin body and legs, it well merits the descriptions "waning" and "fantastically slender" given to it by ornithologists.

Presumably, because of its flimsiness, the Water Measurer doesn't venture outside sheltered nooks at the water's edge. Its body is only $\frac{1}{4}$ inch long and being no thicker than a pin is not easily seen, although the insect is quite common on still and slow running water during the summer months.



It is rather surprising that an insect which is unable to escape or protect itself from other creatures should still exist. One can only assume that when in search of a meal they know that *Hydrometra* cannot really be anything more than "skin and bone." But whatever the reason for its immunity the fact remains that this strange little creature has up to now succeeded in its struggle to avoid extinction.

Fish Diseases (26) Mouth fungus

by R. E. MACDONALD



An illustration showing fungus protruding from the mouth

ALTHOUGH mouth fungus looks similar to skin fungus (*Saprolegnia*) it is not, in fact, caused by a mould but by a slime bacterium.

The mouth and cheeks of a fish suffering from this disease will swell and a substance looking like white cotton wool will protrude from the mouth. The fish will become extremely languid and serious damage may be caused if the disease is not treated early. The fish's breathing frequency and appetite will become affected and death may follow. The disease appears to be contagious.

Mouth fungus (not a very accurate name for a non-fungoid disease!) may be treated by swabbing the mouth of the infected fish with a solution of the dye—Brilliant Green. The fish is then placed immediately after swabbing in a tank containing clean, fresh water.

The recommended solution is prepared by using just enough ethanol to dissolve 4 grains of brilliant green. The dissolved dye is then diluted with 1 Imperial gallon of water. Brilliant green can be obtained from dispensing chemists.

The Junior Aquarist



Reader's Letter

Pen Friend Required

FIRST I will excuse me for all the grammatical and other mistakes I will make in this letter. My name is Karl De Groode and I live in Berchem, a suburb of Antwerp. I am 16 years old and I speak Flemish (you know some people in Belgium speak French). I am a member of the Antwerp Aquarium Society "De Gierur-sciend" ("The Ornamental Fish Lover"). For the moment there are 20 or 21 fish tanks in my fishroom of varying size and a capacity between 2 gallon and 50 gallons (5 liter and 200 liter). Some days ago I saw an old issue of *Water Life and Aquaria World*. So I wrote a letter to the address of the editor. Some days later, I received a letter from *Cape and Aviary Birds*. I read that *Water Life* had ceased publication four or five years ago. In that letter there was also the address of the publication *The Aquarist and Pondkeeper*. So I would ask you, if possible, to send me a letter too and some newer aquarium magazines (1960, 1961, 1962, 1963, 1964, 1965 or so). I would be very pleased if you could give me the address of somebody who would correspond with me, naturally also an aquarium friend (boy, girl, man, woman: everything is good). I am also interested in terraria, so I keep some lizards, frogs, snakes and turtles in 10 large terraria. Perhaps my letter will help to make more ties of friendship between English and Belgium aquarium-fans and that would be fine. O, I should prefer if my correspondent had an age between 17 and 37 years.

Again I will present you my excuses for my possibly bad English, but here in Belgium, our first English lesson is only given when we are 14 years old. I will finish my letter by saying, Dank by voorlaar en hartelijke groeten vanuit België.

KARL DE GROODE,
De Witte Street 49,
Berchem/Antwerp,
Belgium.

P.S.—Except my aquaria and terraria I'm also the owner of 2 dogs (real fox-terriers), 1 cat, 2 chickens, a duck, some rabbits, 5 hamsters, a parrot, an aviary with 35 exotic birds, a monkey and a pheasant. Further, a hedge-hog, 3 scorpions, a young turkey, a fox and a peacock.

Editor's Note.—Perhaps a reader may like to send this enthusiastic pet-keeper some unwanted back copies of the *Aquarist*.

Aquatic Notebook

HAVE you ever considered keeping an aquatic notebook or diary? Such a book can form a very useful reference book for items of information which could normally be forgotten. Although a normal printed diary will do for the job, an even better one can be made from a school exercise book. What sort of information should be included in such a notebook?

One can include short notes on useful information obtained from books or magazines, or from dealers or other aquarists. It is also useful to keep several pages devoted to notes on each separate aquarium which one has. Such notes can begin with the particular date on which a tank is set up, the sort of gravel and rocks used, the numbers and kinds of fishes and plants kept, the temperature of the water, the wattage and type of lighting used and the number of hours during which the tank is lit, daily. Three columns can be ruled on one page, these being used for the date, the pH, and the hardness of the tank water—shown by tests at, say, monthly intervals. Types of food used can also be noted.

Dates on which, and sources from which, new plants and fishes are obtained, can be recorded. Personal breeding records of various fish can be kept. These should contain information on how the fish were conditioned, the water conditions in which they spawned, the date on which the fry were born, how many were raised, first foods on which they were fed, etc.

Other useful facts could include corresponding scales on Centigrade and Fahrenheit thermometers, conversion scales for say, ounces to grams, and grams to grains for use with chemicals when dealing with diseases or algae growths in aquaria. A note of water contained by different sizes of aquaria (remembering to allow for rocks and gravel) is useful information when calculating amounts of chemicals to add to water when treating diseases.

There are a host of other personal details of aquatic interest which could be included in such a notebook, and it is interesting, after a few years, to look back and recall various stages in the development of one's aquatic hobby. A notebook can cost only a few shillings and is a very worthwhile investment.

Colourful Diet by Doris H. Nicholson

It was nearly midnight when the schoolmaster suddenly remembered that he would need some sea water for a lesson on marine biology next day. Rather than leave it till the mad rush of the morning, he decided to go down to the shore there and then. The tide was out. The full moon made his torch unnecessary as he picked his way carefully over the slippery mud and seaweed to the rock pools at low water mark.

There, in the quiet night, he stopped to listen. What was that extraordinary scraping, sucking sound? He bent to stare in amazement at the dozens of limpets, normally clamped so firmly to the rocks. With their shells raised a good quarter of an inch off the ground, they were moving about feeding on the algae, scraping them off the rocks with the edges of their shells. In the stillness of the night the combined noise they made was quite extraordinary.

Yet no one really knows how often limpets need to eat. One professor decided to spend his six weeks vacation studying their feeding habits. He found a thriving colony and camped beside it, but the shellfish refused to co-operate. The wretched creatures simply refused to budge during the whole six weeks.

Periwinkles, too, are known to go without food for a month or more. But if you go down to the water's edge at low tide you can often see them moving about.

Did you know that the colour of a whelk's shell depends on its diet? When it feeds mainly on mussels, the shell is dark, but when it lives on barnacles the shell is off-white or yellow. A striped shell probably means that the whelk has had a varied diet. Wouldn't it be odd if this applied to humans? It is true that people who live mainly on bread and carbohydrates are often pasty-faced, but supposing meat-eaters turned scarlet and vegetarians green! The famous Tyrian purple dye used by the Romans for their imperial robes was obtained from a species of whelk, the *purpura*.

There is competition for food among shore animals, just as there is on the land. To reduce this competition, each kind of shellfish keeps to its own regular zone between high and low tide levels, so there is very little overlapping. A few shore animals live above the high water line where they only get splashed with sea water. You will find periwinkles and other shellfish wedged into cracks in the rocks. On Portland Bill, for instance, the splash zone is so high that there are sea animals living thirty feet up on the cliffs. Warm water shells come only just as far along the south coast as the Isle of Wight and Dorset, where about two hundred varieties



Limpets on rock

Photo: W. Howell

have been recorded. However, only about twenty of these are common.

Most shellfish make their homes on the under sides of rocks or in crevices, where they are protected from the full force of the waves and from the heat of the sun at low tide. Others, like the cockle and razor shells, bury themselves in wet sand or mud by pulling themselves down with their strong muscular feet. By contracting and then suddenly extending its feet, the cockle can leap into the air, jumping along the shore like a frog.

To a limpet there is nothing like 'Home, sweet home'. When it goes for a walk it always comes back to the same spot and settles down in exactly the same position. If you manage to take a limpet off guard with a sudden knock, try turning it round to face the other way. Then, if you spend the rest of the day watching it, you can see it gradually wriggle itself round until it fits into its own particular groove. Its shell grows to fit the rock and it stays there all its life. In fact, on chalk cliffs limpets sometimes dig themselves in so deeply into the soft rock that they can't get out again, and their tunnels help to cause cliff erosion.

Barnacles, too, live all their lives on one spot, but unlike limpets they don't go off in search of food. Their food comes to them in the microscopic plants of the plankton which drifts in the sea. Perhaps this is why the barnacle larvae will only settle in a place where there are, or have once been, other barnacles. Here they can cement themselves to the rock knowing that the right kind of food is available. Nobody knows just how long ago the first lazy barnacle decided to fasten on to a ship's hull and be taken for a ride, instead of swimming around on its own. That is just one of the many mysteries of the sea.

Living Space

ONE of the most important things to remember when keeping fishes is that they must have sufficient swimming space. Even with artificial aeration it may be possible to keep more than the usual number of fishes in a tank, but they will not thrive and grow unless they have enough room. The old idea was to have an inch of fish to each gallon of water. This is dangerous as the shape of the tank can make all the difference as to whether or not this old rule applies. For instance, let us consider a tank which has a frame 48 inches by 12 by 12 inches. If the tank was glazed so that it stood on end then there would only be 144 square inches of surface area (12 by 12 in.). This would only hold six inches of fish. If on the other hand the tank was glazed so that the surface area was 48 in. by 12 in., then it would hold four times as many fishes but only the same amount of water, namely, 24 gallons (approximately).

This rule then, should be an inch of fish (not counting the tail) to each 24 square inches of surface area. When collecting such fishes as minnows for your tank make sure that you do not overcrowd them in the carrying-can. If you do it is practically certain that you will have nothing but dead fishes when you get home. It is much better to carry two or three and arrive home with the fishes in good health than to chance trying to have too many and lose the lot.

Do also remember that fishes do not have to be fed every hour or so. They can exist for long periods with no artificial feeding. Most fishes can eat much of the soft vegetation in the pond or tank and so no more feeding than twice a day is enough for most fishes in captivity. Any un eaten food can soon pollute the water, with eventual fatal results to the fish which will die through lack of oxygen.

White Cloud Mountain Minnow

by M. J. PARRY

THE White Cloud Mountain Minnow (*Tanichthys albanella*), a true jewel of the aquarium, was first introduced into Britain as an aquarium fish in the 1930s, following its discovery in the White Cloud Mountains of Canton, China, by a Chinese Boy Scout—Tan. Since this time it has enjoyed great popularity, now being a fish eagerly sought after by both new and experienced aquarists.

During the summer months it is possible to keep the species in unheated aquaria. Indeed, in this respect it can be said to be a "coldwater fish", being able to withstand water temperatures as low as 45°F. It is surprisingly catholic in taste, being not too particular about water conditions, nor food, accepting virtually anything and everything. It is an excellent shoaling fish, two dozen to a three foot tank well planted with *Cryptocorynes* and Amazon Sword plants (*Echinodorus* varieties) providing a beautiful, ever-moving picture.

The general body colour of the fish is a reddish-brown, the sides being adorned by three horizontal stripes of gold, green, and brownish-black. Maximum length of the species is 1½ inches. Breeding is easily accomplished with adult fish, females being easily recognised by their plumper appearance over the slimmer male.

Both fishes should be separated for a period of seven days and fed on lavish amounts of *Daphnia* and *Tubifex* together with a little white worm in order to bring them into breeding condition. The spawning tank, preferably not smaller than the standard 24 in. x 12 in. x 12 in., should be set up with water pH 6.8-7.2. Coarse gravel should carpet the bottom, which should be thickly planted with anchored bushy plants such as *Elodea densa*, hornwort, *Najas* etc. Water depth should be 4 inches, and temperature maintained at 75°-78°F.

The pair should be introduced into the breeding tank late in the evening in order that they may rest before the rigours of spawning which usually occurs early the next morning. There are exceptions to this rule, however, as I have had infrequent spawnings during the late afternoon and early evening.

The mating act itself is very reminiscent of the breeding performance of the Danio family (Zebra fish etc.) in that vigorous driving of the female is undertaken by the male, resulting in the former scattering up to 150 eggs, which are immediately fertilised by the male.

Upon termination of this act it is always an advisable precaution to remove both parents as although it is widely reputed that neither fish take any further interest in either the eggs or the resultant offspring it is better to be safe than sorry.

As an added precaution methylene blue in the form of five drops of 5% aqueous solution per gallon of water may be added to the aquarium in order to discourage bacterial growth.

Hatching occurs within 48 hours, the fry becoming free

swimming on the third day after the absorption of their yolk-sac. They will now be ready to accept their first food, which for the first week to ten days (depending upon growth), should be restricted to infusoria. Thereon the now familiar foods of newly hatched brine shrimp, microworms, sifted *Daphnia* etc. may be fed on which rapid progress will be made until within six months they will be displaying adult liveliness.

An alternative method of breeding favoured by some aquarists is that known as "flock breeding," when perhaps a dozen, or even more fish (an equal number of males to females), are housed in an aquarium exclusively devoted to this species.

This is perhaps an ideal method for those aquarists with just one or two aquaria, though to my mind it does not allow the choice of selective breeding in order to bring out desired characteristics in future stock.

Market Review

Review of the Dynaflo Motor Filter

by

Stan Harmon

Filters and Aerator are as numerous as the leaves in the forest, but here is a "Power Filter" that is ideal both for breeding and show tank alike.

Given the title of the split-diaphragm and the knock of the piston and in its place we have the unbelievably quiet and unobtrusive Dynaflo Magnetic Drive Filter.

Description

This Power Filter is constructed from its easily assembled units: Filter Box, Return Tube and Grid, Siphon with Removable Screen, Starter-Locking Stick and self-switched Drive Motor.

The Filter Box is rectangular (7" x 2" x 8") and made from durable clear plastic; it has a hooked flange at the top for attachment to the aquarium. Inside the filter is the Return Tube and Grid which also houses the magnetic impeller vane pump.

The Drive Motor (Magnetic not Diesel), compact and easily attached or removed from the bottom of the Filter Box by a sliding water Locking of Drive to Filter is done with its Starter-Locking Stick.

Performance

Filtration through glass wool and charcoal is fast and efficient.

Starting the siphon is easy with the use of the Starter Stick, and ample water is sent to the Filter.

Flow of water through the Directional Return Tube is powerful, and provides both circulation and aeration.

The Motor runs cold, silent and almost vibrationless.

Observations

A modification of the Return Tube on 100 Yards opened the Filtration and replacement of the charcoal with peat or water-softener crystals sandwiched between two layers of glass wool was an asset in the breeding tank.

Gastropod Gastronomics

by B. WHITESIDE

HAVING glazed a couple of aquaria about six months ago, using a well-known brand of aquarium glazing compound, I was surprised to find recently that the glass seemed to be leaving the compound at various places around the points where glass met glass in the corner uprights, and where the glass met the frame at the top of the aquarium. This seemed unusual as the tanks had only been set up for six months. On investigating further I noticed an accumulation of a white dust-like precipitate on the gravel in each of the four corners of the tanks. As the glazing compound visible on the outside of the tanks was normal, I assumed that the water in the tanks was dissolving the compound.

With the aid of a hand lens, I found a lot of the white precipitate to be composed of disintegrating snail droppings. I had at last traced the cause.

Examination of the glazed joints showed a host of small snails, mainly ramshorns, which were obviously enjoying the aquarium cement as a food. Eating expensive aquarium plants is a bad enough problem with which to contend, but the prospect of having to strip down an aquarium, re-glaze it, and set it up again, all because of snails, makes the former problem a relatively minor one. Obviously the glazing compound contains something which the snails can use as food and which is non-poisonous to them. In both tanks the glass was cut slightly smaller than that which would have been ideal, hence there was enough compound exposed for the snails to be able to eat. Larger joints of glass would have helped to solve the problem but a glazing compound which the snails will not eat is the answer. Poisonous additions to glazing compounds to discourage attacks by snails would obviously kill fish as well. Aquaria glazed with another compound have not suffered attacks from snails.

The usual precautions can be taken when setting up the aquarium as regards the cleaning of plants, using solutions of various chemicals such as potassium permanganate, but none of these is completely effective against the introduction of snails' eggs. Sooner or later snails will be introduced into the planted aquarium and, unfortunately, once they are in it is almost impossible to get rid of them. Removal by hand is an obvious method, even if slow and time consuming.

One method which I have found to be of some use is to introduce into the tank a small piece of raw meat such as steak, on a piece of thread. It should be allowed to remain in the tank overnight, resting on the gravel. The snail will feed on the meat for a time. Next morning, with luck, a number of the snail population should be found adhering to the meat which can be removed. It should not be allowed to remain in the tank for too long

or it may foul the water. This procedure may be repeated at intervals and will help to cut down the snail population.

With the large number of remedies available for the treatment of diseases in aquarium fishes, it is a pity that none of the makers of such products has, as yet, produced a compound which can be used to control water snails in the home aquarium. Let's hope they soon do.

Book Review

Aquarium Plants by Gerhard Brunner, translated by Gwynne Vevers. Studio Vista Limited, London. Price 10s. 6d.

BOOKS on aquarium plants are few in number, but here we have a paperback book of 94 pages at a reasonable price. Translated from the original German, the book is well illustrated with drawings which are an aid in the identification of aquatic plants, and the cover has an attractive colour photograph of a variety of plants. Originally published in 1963, the book includes some of the more recent introductions missing in older books on aquatic plants.

Beginning with an introduction on the purposes of plants in aquaria, the book continues with an interesting section on lighting and the most suitable types of lamps and fluorescent tubes. Water conditions are quite well treated both as regards p.H. and hardness, as well as sources of water for aquarium use. The author has also noted the necessity of the correct choice of rocks and gravel as regards their calcium content.

Food requirements of plants is well covered and suitable temperatures are given in both Fahrenheit and Centigrade scales, with an interesting note on the fact that temperatures in the gravel may be lower than in the general body of tank water. Sections on plant propagation and choice of plants are useful. Plants are classified by leaf forms and not by flowers, the latter type of classification being of little use as many aquatic plants do not commonly flower in the home aquarium. An explanation of botanical terms used is useful to the aquarist not schooled in this area of plant nomenclature.

Continued on page 73

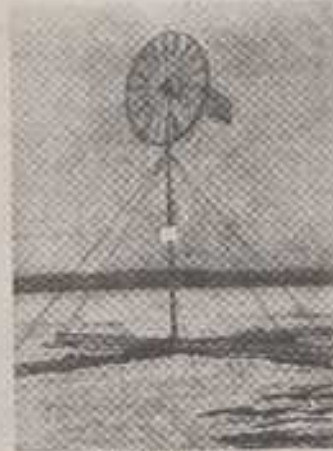
МНОГИЕ озера и пруды в нашей стране отмирают в результате или ежегодных заморозов. Заморы снижают рыбопродуктивность, а часть водоемов становится безрыбной.

ХОРОШИЙ МЕТОД БОРЬБЫ С ЗАМОРАМИ

В. БАЛАНОВА,
наладчик Кочевниковской вод.



Кочевниковская вод.



Аппарат П. И. Фурцева



Площадь оттаявшего льда и зона безрыбья

photo from Soviet Publication

Russian

Canadian



THE AQUARIST

Fish 'Winterkill'

by FRANCIS DICKIE

IT is one of the remarkable workings of the human mind that men, many thousands of miles apart, and unknown to each other, have sometimes achieved exactly the same solution to overcome a problem never previously satisfactorily solved.

The most unusual of these was recently carried out. The striking feature of this is the coincidence that fishermen in Russia did their experiment about the same time as that in British Columbia. This is borne out by the fact that the official Soviet government publication, *Fish and Fish Culture*, printed the pictures (shown here), that reached Vancouver, British Columbia, the same month as similar photographs were made at Kilpoola Lake, B.C., of the same experiment. The comparative pictures are shown here.

Here are the extracts from the article in the official Soviet government publication. The striking similarity between the pictures here and those of British Columbia experiment are apparent. The translation reads approximately as follows: "Many lakes and streams in Russia are subjected to early freezing. This freezing reduces fish population in some and kills completely in others".

The project developed at Osoyoos, British Columbia, is so much like that described in the Russian journal that the Soviet text could have been translated to describe the British Columbia successful experiment. It is truly amazing that a group of fishing enthusiasts in a small British Columbia town named Osoyoos, and Soviet technicians some 5,000 miles away, should both have tackled the problem of 'winterkill' in exactly the same manner at exactly the same time.

When someone suggested that the installation of a windmill at distant Kilpoola Lake, B.C., would overcome the regular 'winterkill' of fish there, it sounded like a pretty wild idea. The Osoyoos Fish and Game Club had undertaken some difficult projects in the past but the windmill proposition seemed as unlikely an undertaking as they had yet encountered.

'Winterkill' is a phenomenon observed in many British Columbia lakes. Such lakes are usually shallow, and warm up readily in summer. This encourages a heavy growth of microscopic plant and animal life known as plankton. During the summer there is plenty of oxygen

available at the lake's surface, but this is cut off each fall when the lake is covered with ice. The continuing decay of the plankton produced in summer results in heavy depletion of oxygen and, as winter conditions continue, the oxygen may be so much depleted that fish life is destroyed.

Many attempts have been made to oxygenate the water in such lakes and so overcome 'winterkill'. Manual destruction of lake ice, mechanically operated pumps to stir lake waters and the scattering of lamp-black to induce ice-melt, are among the methods that have been tried. As far as can be ascertained, the Kilpoola Lake experiment marks the first time in North America that a windmill has been used, although the principle has just been adopted in the Soviet Union. (See photographs). The first step was to lay a perforated pipe along the bottom of Kilpoola Lake. Then the erection of the tower and the installation of an air pump geared to the reciprocating action of the windmill. The force of the wind would press air along the pipe on the lake's bottom thereby circulating the warmer water at lower levels and preventing the surface of the lake from freezing. Five inches of ice covered Kilpoola Lake when at last the windmill went into action and a large crowd had gathered to see what would happen. The people grouped themselves around a hole, that had been cut through the ice at the foot of the windmill. As great air bubbles were seen being forced up through the hole, a loud cheer went up. The plan had worked. Within forty-eight hours the warmer sub-surface waters cut through the ice in five large, round rings. The battle of 'winterkill' in Kilpoola Lake had been won; also in northern Russia.

continued from page 71

Book Review

The book gives valuable information on the cultivation of individual species of plants, with special reference to light, water hardness and feeding requirements, although not much information is given on p.H. values of water for specific plants. But exact figures for this latter facet of plant growth are often of doubtful value anyway. Helpful sections on the identification of different species of plants in four of the most popular plant groups concludes the book which has an index.

For the novice or the more advanced aquarist, this attractive book has a lot of very useful information to impart, and at such a relatively low price deserves a place in the aquarist's library. Three other books on aquarium keeping subjects are also available in this series, and other paper-backs are being prepared.

1. Windmill Kilpoola Lake, B.C. First unique conservation of commercial and game fish

2. Fishermen's first experiment with air pressure clears ice in 48 hours to a depth of 5 inches

3. "Winter miracle!" said William Ward game official. The windmill clears 5 inch thick ice on shallow lakes in 48 hours. Some fish otherwise winter killed

OUR EXPERTS' ANSWERS TO TROPICAL FISH-KEEPING QUERIES

What are the most natural ways of making soft water acid?

Strain it through a thickish layer of dried oak or beech leaves or waterlogged peat. Alternatively, store it for several weeks in a container made of teak, cedar or oak.

Will the Japanese weatherfish (*Misgurnus aspidirostris*) live in an unheated tank, and will it live on peaceful terms with other fishes?

M. aspidirostris will stand a temperature down to the forties (°F), but specimens bought from a dealer who has been keeping them under tropical conditions should not be subjected to any sudden change of temperature. In other words, acclimatization to cold water should be brought about very gradually. It is not a pugnacious species, but the fact that it attains a length of nearly a foot, and stirs up the compost tends to limit its appeal.

I have just purchased four baby *Symphysodon discus*. What sort of conditions and treatment do you advise?

Give these fish a well-planted tank filled with a soft, non-alkaline water and disturb them as little as possible. That is to say, don't poke about in their aquarium with with a dip-tube and the like. If other fishes are present, see that they do not chase after the discus, or scare them away from food. And speaking of food, see that the young discus get their fill. Young ones in captivity often lack appetite and can be extremely faddy.

I have an angel fish which has developed fungus disease on its tail. Will this disease spread to the other fish in the tank?

We do not think so, provided the tank is kept scrupulously clean and the other fishes do not have any open sores or bad bruises or split fins to attract infection.

I siphon the water out of my 18 in. by 12 in. by 12 in. community tank every fortnight or so, and fill up with fresh from the tap. I also give my fish plenty of live food. Yet with all this care, I cannot keep my fishes alive. Where am I going wrong?

Generally speaking, tropical fishes do not last long if they are given frequent complete changes of water, unless it is of the same quality (chemically speaking) as that in which they have been living. Another thing that tropicals cannot stand is an abrupt change of temperature. If your tank is overcrowded—if some of the fish gasp at the surface a few days after fresh water has been introduced—reduce their numbers, or install a pump to maintain an adequate supply of oxygen. But leave the water alone. Unless you overfeed the fish and leave the uneaten food to turn bad on the bottom, the water in a properly stocked and cared for aquarium should stay wholesome indefinitely.

What is the scientific name of the bald shark? Is this beautiful fish suitable for a community tank?

The scientific name of this species is *Balaeniceps melanocephalus*. It is a peaceful species that grows to a large size—about 6 in. in the aquarium against 14 in. or so in the wild. Therefore, it needs spacious quarters to allow for proper development.

I hope to obtain several black-banded sunfish before the month is out. What sort of food, set-up, and temperature range do you advise?

Feed this centrarchid on live *Daphnia*, gnat larvae and worms. Few black-banded sunfish will accept dried food. A temperature of about 65°F (18°C), with a range of a few degrees (°F) in either direction is recommended. In the wild state this species inhabits the acid swamps that are quite common in New Jersey and many of the eastern states of the U.S. southwards to Florida. Therefore, the black-banded sunfish needs soft, acid water in the aquarium. Plenty of swimming space and dense thickets of plants to play hide-and-seek in are necessary, too.

Many queries from readers of "The Aquarist" are answered by post each month, all aspects of the fancy being covered. Not all queries and answers can be published, and a stamped self-addressed envelope should be sent to that a direct reply can be given.



Astronotus ocellatus or marbled cichlid

Is it possible to keep a young *Astronotus ocellatus* in a community tank?

The short answer is yes. But do bear in mind that as this handsomely marked cichlid increases in size—and it will attain about 12 in. in length—so does its appetite, and any fish small enough to be swallowed will be eaten before long.

I have been told that the so-called Indian fern (*Ceratopteris thalassoides*) is eaten as a vegetable by some of the inhabitants of south-east Asia. Is this true?

It is true. Both the rooted and the floating forms of this aquatic fern are eaten as a greenfood (presumably when there is nothing better to be had) in parts of Indonesia and Malaya.

Can you give me some information about a floating plant botanically known as *Ritidocarpus nasuta*?

This plant is found in a variety of climates in many parts of the world. It is rare and localised in Britain. Our native species does not appear to prosper in the aquarium. Maybe this is because it needs cool and very shallow water over a rich acid mud and plenty of bright daylight.

I have a plecostomus catfish which is growing fast in a 30 tank. What length is it likely to attain and what foods suit it best?

This interesting sucker catfish, referred to by some authorities as *Hypostomus plecostomus* instead of the more widely used name of *Plecostomus plecostomus* (commoner), can attain a length of about 7 in. to 12 in. It should certainly reach at least 7 in. in your aquarium provided you keep the water well-aerated and at a temperature of about 75°F (24°C). The foods most likely to keep it in tip-top condition are tiny worms (red or white), minced raw beef and frequent feeds of cooked lettuce, spinach or tomato or young nettle tops. (In the wild state this catfish feeds largely on soft algae.)

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I am writing to ask for information on Dog Fish. I have one about 21 in. long but no-one seems to know anything about this fish.

This is the name given by some people to one of the Mud-minnows, probably *Umbra limi*, or another called *Chebra pygmaea*. They are found in the Mississippi valley and the Great lakes. They grow to about four inches long and are not difficult to keep as they will take most foods as eaten by goldfish. They do not require high temperatures and in their native habitats eat crustaceans, insects and soft vegetation. I remember that one was caught in a pond some years ago by one of Hendon Aquatic Society members, and no doubt it had been placed there by another aquarist but how long it had lived under those conditions it is impossible to say.

Some of my fishes in the pond have been attacked by fungus disease. Why is this and what is the cure?

Many goldfish get attacked by fungus during the spring. It is probably caused by several factors. In the first place the cause is a form of spore of the disease *saprolegnia*, which is found in most waters. A healthy fish has a covering of mucus or slime which protects it from attacks by diseases. Once a fish gets out of condition it loses some of this mucus covering or it is weakened. It is then that the spores of the disease can get a hold. A healthy unharmed fish is seldom attacked. The fungus may also get a hold on a fish which may be quite healthy but which has had some damage which has broken the skin or removed some scales. Even the careless handling or netting of a fish can remove some of the mucus and the fish would then be liable to be attacked. The cure is to place the fish in a spare clean tank. Add a tablespoonful of sea salt, Tishman's will do well, to a gallon of water. Do not stir but allow the salt to dissolve gradually. Leave the fish in this solution, in the shade for a few days. If no improvement is seen add another similar amount of salt. This should cure the fish unless it had become so weakened by a severe attack which was not seen in time. Once the disease reaches the gills it is usually fatal, but it is always possible to cure a fish if caught in time. As the disease clears up fresh water should be added to weaken the solution until it is back to normal. Do not use deep containers as curing tanks, a plastic washing-up bowl is ideal. The shallower the water the more likely is it to remain well oxygenated.

Last summer I sunk a galvanised bath in the ground and used it as a fish pond. The fishes died and I wonder if I should have painted the bath with anything to make it safer?

If the galvanising was fairly fresh it is possible for it to poison the fishes. The bath could be painted with a waterproof paint or by a strong wash with cement. If the latter is used it will only be safe if first washed out well to remove any fresh lime.

I have a stream at the bottom of the garden with two pools covered by a waterfall. It is usually fairly placid except after some or heavy rains. Could I grow water lilies in the pools?

Water lilies prefer a fairly still water and do not thrive well in running water. It may be possible to so construct a weir so that any excess water would flow away from the normal course, thus missing the pools. You could so arrange it that fresh water could be run into the pools if and when necessary.

I would like to know how to keep a pike and where I can obtain one?

Pike feed almost entirely on live food, other fishes being their main diet. They will however take garden worms or other forms of live foods. A small one of not more than 6 to 8 inches long would be a very attractive fish to keep in a 36 by 12 by 12 in. tank. Pike grow to a very

large size, up to 35 lbs., or more, but you might keep a small one for a few years. I do not know of any dealer able to supply one, but it would be possible to get in touch with a local angler who might be able to catch you one. If you knew of a local water where Pike abound it might be possible to catch a small one by netting among the water weeds at the side.

I have had golden orfe on their sides in my outdoor pond and cannot make out what is the matter with them?

Golden orfe will turn on their sides when the water lacks oxygen. During thundery weather the water gets too warm and foul for these river-type fishes. If you find one on its side again just play the hose on it with fresh water for a little while and the fish will soon return to normal and be none the worse for the experience.

Which is the ingredient which brings out the colour in fish?

This is ground paprika pepper as used to colour-feed canaries, etc.

What is agar-agar, please?

This is a substance used by biologists to make a culture for growing bacteria, etc. It is made from a red seaweed.

What is Kelp meal?

This is made from seaweed.

What is the best way to bring up fish to big sizes?

Plenty of swimming space is the most important point in my opinion. Then an adequate supply of varied foods together with the correct temperature. A well oxygenated water at all times ensures that the fishes are able to feed at their maximum and so keep growing.

I have a large pond with golden orfe, fancy goldfish and golden robbi. I would like to add a pair of Terrapins. Would they live with the other inhabitants?

The Terrapins would have to have a rock or small island on which to climb at times. They can take a bite from a fish if they get near enough to one. They would live in the pond during the summer, but would have to be taken inside for the winter.

I have six 3 in. and two 2 in. goldfish, could I keep them in a tank 24 by 12 by 12 ins., well planted and aerated?

Your tank will hold 12 in. of fish, not counting the tail. If you have more they may not thrive, even with aeration.

My pond water does not keep clear even though it gets plenty of rain water from the roof. Is there anything I can do to improve matters?

The first thing to do is to stop using rain water from the roof. Rain water might be all right for the pond if one could be sure it came in clean and pure. The water from a roof is unlikely to be either clean or pure. Just as an experiment, tie an old sock over the bottom of the rain water pipe for a month or so. Then turn it inside out and you will get a surprise. I don't think that you would like to know that your fishes have to endure the mixture of soot, fish and sulphur you find in the sock.

I am anticipating breeding shubunkins. Can you recommend a book on breeding them? Also, do all Bristolis have long tails, and if so when do they grow longer than the average tail?

You can get all the information on breeding shubunkins and other types of goldfish from the Aquarist book, "Coldwater Fishkeeping," price 5s. 6d. post free from The Aquarist, Bristol shubunkins differ from London shubunkins as follows:—Londons are shaped as for the common goldfish but Bristolis are more streamlined with larger finnage. The caudal fin or tail is broader and a bit longer. Young shubunkins should show the difference at six months of age, although the tail will not develop fully for some months after, a lot depends on the way they are grown on as to when they would be fully developed.

The Common Carp

by B. FRY

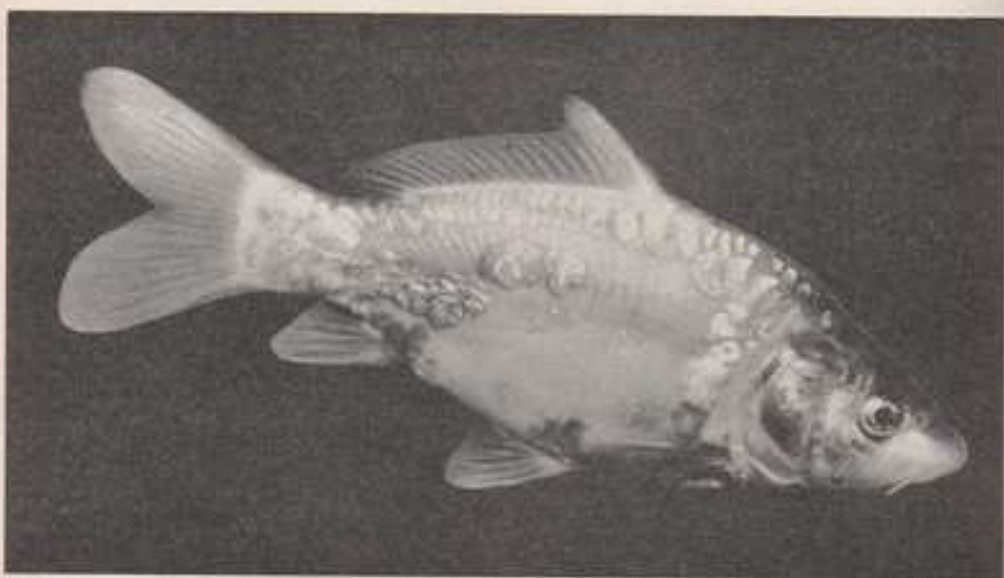
THAT the common carp (*Cyprinus carpio*) is so widely and plentifully distributed over the world today—it was first introduced into Europe from Asia some five or six hundred years ago—is largely due to its usefulness to man as food, its prolificity, and its tolerance of conditions (climatic as well as environmental) that would kill most other coldwater fishes in the proverbial no time. Moreover, it provides the angler with excellent sport.

The common carp can live a long time—twenty or more years—in waters favourable to its development. The waters that suit it best are those which are still or sluggish and cover a soft bed in which it will make itself snug during the coldest days of winter. There it will remain quiescent and live on the fat it has accumulated over the past months until milder days return. And when these do it starts seeking food again.

The natural food of *C. carpio* consists of insects and

their larvae, tiny molluscs and crustaceans (many of which it sifts from the mud), worms, the eggs and fry of its own or other species, and the tender leaves and shoots of submerged plants. Essentially it is a bottom-haunting fish, but in favourable weather it will rise to the surface every so often to gulp in anything edible which floats its way, or a mouthful of air. Sometimes it will even linger awhile among the lily pads or water-invading sedges to bask in the sun.

The largest carp ever caught in Britain (in 1952) weighed 44 lb. and was presented to the London Zoo Aquarium. This fish, however, was a very exceptional specimen, for ordinarily carp in Britain seldom exceed 2 ft. in length or weigh more than about 9 lb. Yet on the Continent, where the fish is bred and fattened especially for the table, *C. carpio* sometimes attains a length of more than 3 ft. and a weight of up to 80 lb. Incompletely scaled and/or beautifully



Mirror or king carp



A fine specimen of the golden variety of carp known as Hi-goi

coloured forms of this species, such as the mirror (spiegel, or king) carp, the leather carp, and the red or yellow carp so dear to oriental gourmets and fish-fanciers and popularly referred to by their Japanese name of hi-goi (though bearing a Japanese name the fish are said to have been first developed in China), may be regarded as triumphs of the breeders' art. A few of these forms (the least decorative, of course) are eaten with relish on Fridays and feast-days in many north or central European households; the rest, sensibly enough, are cultivated for their beauty alone and are sought after for stocking ornamental ponds and lakes.

Externally the most characteristic features of the common carp are a noticeably humped back, large scales, two pairs of barbels on the fleshy-bipped mouth, and a dorsal fin that rises about the middle of the body and extends almost to the tail. The colour varies greatly with age and locality, but generally it is drab-brown to greeny grey above, brassy on the flanks, and white inclining to yellow below. The fins are grey to brown flushed with red.

C. carpio attains sexual maturity in its third or fourth year and broods as early as April and as late as June. In this it follows the pattern of most coarse fish. When the spawning season comes round, the gill covers of the potent male develop a slight rash of white blébs or tubercles, and

the ova-loaded female shows, quite naturally, distended sides.

Countless adhesive eggs are extruded during vigorous pomings and bumpings in the weedy shallows, and it is not uncommon for a single female to be driven by two or three males. It is said on good authority that up to 300,000 eggs can be laid at a spawning by a female not more than five years old. At a temperature of 60°F (16°C) to 68°F (20°C) quite a large proportion of these eggs hatch out within the space of a few days and the fry absorb the yolk sac and become free-swimming a day or two later. Thenceforward they live on infusorians until they are large enough to go after bulkier food.

Two or three young carp which, for the first few months of their lives, are of an attractive burnished bronze hue, make a worthy addition to any coldwater aquarium large enough to accommodate them in comfort and leave room for some growth. Unless there is something very exceptional about them or their conditions, they will stand quite a wide range of temperature without ill effects and accept any small live or dried food. When they reach an embarrassing size nothing suits them better than life in a well planned and correctly proportioned garden pond—that is to say a pond that is wide enough to absorb plenty of oxygen from the contacting air and deep enough (at least 2 feet) to give protection against winter's freezing touch.

our readers



write

Readers are invited to express their views and opinions on subjects of interest to aquarists. The Editor reserves the right to shorten letters when considered necessary and is not responsible for the opinions expressed by correspondents.

Address letters to The Editor, *The Aquarist*,
The Butts, Half Acre, Brentford, Middlesex

Llanerch Deer Park

IT is with some surprise that I read in an article by Mike Shoozy that Mr. Petrie of Llanerch Deer Park told him that he (Petrie) was responsible for the Aquarium at the Deer Park.

I would point out that it was I who, before Mr. Petrie took over, conceived, designed and indeed did most of the construction work on the Wine Cellar Aquarium. The only reason I protest against the statement is that as so many people who visit my own Aquarium in Rhyl know that I was responsible for the Llanerch Aquarium they are now asking questions about it, I might add that I have been responsible for the designing and running of a number of public Aquariums for the past twenty years, the present one has been running for the past eight years.

I. T. Williams, F.Z.S.
Dyserth, Flint.

Co-operation overcomes Disaster

ON behalf of the Prestwich and Bury A.S., I would like to convey through the medium of your magazine, my appreciation and admiration of the behaviour of exhibitors at our recent open show. Half way through benching, a large table collapsed, shooting tanks, jars, fish and water on to the floor. Everybody sprang into action, another table was found, spare jars appeared as if by magic, and in a miraculously short space of time, only the wet floor remained to indicate that anything out of the ordinary had occurred.

Not one murmur of complaint or criticism did I hear and I consider this a splendid example of the bond which so closely unites people who keep fish as a hobby.

T. Campbell,
Show Secretary,
Bury, Lancs.

A Problem Answered?

REFERRING to Mr. MacKinnon's letter in the May issue, I have thought out and tried this variation.

I had an old 18 by 10 ins. sheet of glass I saved from an old tank which suited my requirements. My 24 by 12 ins. tank hood was just 10 ins. deep.

I then proceeded to make four aluminium brackets to fix to the hood. These were fixed by one set of nuts and bolts to each. The glass was then carefully slid in leaving two inches either side of the hood, for ventilation. In my view (no boasting) this is a neater but more expensive job than that of Mr. MacKinnon's and still retains his advantages.

Here ventilation and cooling is no problem; the gaps left either side prevent (1) over heating, experienced by many, (2) the damage done by drops of water from the air stone. This is overcome by concealing the air stone in the middle of the tank, under the gravel or surrounded by plants.

I hope this is of some use to the person who wants that something extra.

A. GARDNER,
Chelmsford, Essex.

A Slight Clarification

THE article on "Why not try marines?" in the May edition was, I feel, just what is needed; a simple straightforward guide to anybody starting on this most interesting branch of the hobby. Mr. Soanes clarifies the subject so that even the most inexperienced aquarist cannot fail to see the advantages of having a tank whose inmates cost little or nothing, with no electricity bills (save the aerator) and little trouble to maintain.

One or two points, however, are mentioned: firstly, that seaweeds cannot be grown under aquarium conditions and, secondly, that the common dog-whelk can be kept successfully. It has been stated categorically by several books on the subject that seaweeds cannot be grown, but this is in fact only partially correct as many species such as *Ulva* and certain other chlorophytes adapt to aquaria life quite successfully and I myself have kept them in native and tropical marine aquaria. Secondly, I believe Mr. Soanes mentions the fact that the dog whelks live on algae, but I was under the impression that whelks lived on other molluscs, basically mussels, and did not eat algae. Could Mr. Soanes be confusing them with the winkles, all of which are vegetarian?

G. JENNINGS,
Hon. secretary, Marine Study Aquatic Society
of Great Britain

Cure for Hydra

WITH reference to many articles in fish books dealing with *Hydra* and the difficulties of removing these pests once settled, brings me to tell of my own experience a few months back.

I had collected rather a lot of daphnia from natural sources. After feeding for a couple of days, I noticed *Hydra* in all tanks and I was horrified. I rushed indeed looked up all books and saw to my relief that they will not

affect larger fish. I then noticed a lot of work was needed to clear this pest from my tanks, such as drying out for a couple of days or a potassium permanganate bath; so I left it for a week until I had time to do this.

When the time came I noticed five tanks previously having *Hydra* in were clear, while all other tanks were much worse. These tanks after a lot of comparison, I discovered, had only one difference, and that was my little tiger eating fish, the sucking loach. I believe it was (*Cyrtocochilus aysonensis*) from Thailand, so these I transferred to the other tanks and left for two weeks. They were, after this time also clear from *Hydra*.

I had no reason to reinfest my tanks with *Hydra* to experiment, as I was well satisfied with the results of my accidental infestation.

All I can say is I was very grateful to this fish for many hours saved on a heartbreaking job of taking tanks to pieces.

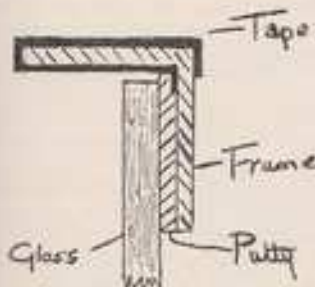
I do hope this letter will be published as it may help many people to get rid of this pest.

B. L. WELCH,
Shepperton, Middx.

Rust-proofing tanks

It was suggested that the following idea used by many in our Society would be of use and interest to other aquarists.

It involves the use of self-adhesive P.V.C. tape.



By lining the inside top angle and round the outside top of a frame, prior to glazing, this will reduce rusting by maintenance to nil. The tape is sold under the name Scotch Tape.

R. SYERS,
Secretary, Boston and District A.S.

Aquaria Frames

COULD you kindly insert the following in your 'Our Readers' column.

I thank all correspondents for their letters on my albino catfish which I still have in good health (with no more babies).

Could any reader tell me of a firm that can supply aquaria frames in a reasonable time, i.e., 10-14 days after order.

I have tried all advertisers in *Aquarist*. One returned P.O. after seven weeks; one delivered in nine weeks and I am still awaiting delivery from the third firm after six weeks. All were stock-size frames which could have been sent by

return. I think these firms are taking aquarists for a ride.
W. BOWMAN.

Referring to March "Aquarists' Notebook"

IN reference to P. M. Fuller's article in the March issue of *The Aquarist*, regarding the Proteous Fish from Yugoslavia. Page 221, *Aquarists' Notebook*.

I think you will find that this is not a fish but an amphibian—probably *Proteus a. nasimus*, cave salamander or olm (purely aquatic).

K. DODD,
Roxford, Essex.

BORROW'S NOTE—This is most likely.

Java Moss

A FRIEND of mine, Mr. Aldens by name, receives your fine magazine. A little while back you featured an article on Java Moss, the very plant that I have been trying to procure from sources both in Canada and the United States, but to no avail. Would you please be so kind as to direct me to a source of this plant; it would be highly appreciated.

You no doubt have heard of the American Killifish Association, an organization which I have the pleasure of belonging (I am on the present Board of Trustees). We at present are trying to locate a source of Java Moss, a most valuable plant in a killifish set-up, and would gladly attribute any credit due to you if this plant was secured.

Anxious to hear from you. Thank you for anything done on our behalf.

Rev. GUY M. CARRIERS,
Sacred Heart Parish,
Box 85,
Chauvin, Alberta,
Canada.

Terrapins and Guppies

ON reading Mr. G. W. William's letter in the February edition of *The Aquarist* on keeping terrapins in the tropical aquarium, I decided that I would like to try it.

I kept the water in my 24 by 12 by 12 in. tank at 76°F and placed on the water a small wooden raft. I then purchased two terrapins which I placed in the tank and then watched them swimming about the tank looking for food.

They fed greedily on raw meat, fish, small earthworms and dried flies.

About a week later I introduced a pair of guppies to the tank. At first the terrapins followed them suspiciously, but after a few days they settled down and since then the guppies have bred twice in the same tank. The young fish are growing quickly and healthily in a fry-nursery.

ALAN LEADING (14),
Flintsham, Wakefield.

Care with Phenoxetol

I WOULD like to refer to the article on Fish Diseases by Mr. MacDonald—page 55 of your June issue.

May I point out that it is cheaper and easier to use Liquitox rather than Phenoxetol as suggested by Mr. MacDonald. Liquitox is pure Phenoxetol and is produced in capsule form so that one capsule will treat four gallons of aquarium water to give a one in 10,000 solution which is approximately the strength recommended in the article.

I would also like to point out that it is extremely important to use a special grade of Phenoxetol since some grades contain free Phenol which can kill the fish.

J. N. CARRINGTON,
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Aphyosemion vexillifer

by JACK HEMS



Aphyosemion vexillifer (male)

THIS species which, given the right conditions, breeds readily in captivity is, without doubt, among the showiest and most active of the oviparous cyprinodonts or killifish native to West Africa. In fact, no one could see a few specimens cavorting in a dealer's tank without purchasing a pair before leaving, or carrying away the memory of their lively charm.

The general appearance of the male is a beautiful blue-green darkening to blackish on the back and shading to pale greeny-gold on the belly. Numerous red blotches, spots and streaky markings ornament the body from the head to the tail. Red spots on a blue-green ground add attraction to the banner-like dorsal fin. The green caudal fin has red spots in the centre, a red posterior margin, and bottom and top margins of red, or orange, with an outer lining of yellow, or white. A red stripe underlined with yellow extends along the bottom of the yellow anal fin. The paired fins are either greenish or ochre yellow in hue. Telling the sexes apart is not difficult; for the female is more brownish than green and the red markings that decorate her sides and fins are fewer in number and more subdued than those of the male. Normally, the male is larger than the female, and attains about 2½ in. in length.

Above all things that contribute to the fish's well-being (apart from a generous diet of live food and/or suitable substitutes) are soft, acid water (preferably over a peat-darkened bottom), and a rather subdued light. Among the submerged plants suited to such an environment are Java moss (*Vesicularia dubyana*), stonewort (*Nitella flexilis*), ivy-leaved duckweed (*Lemna trisulca*) and *Cryptocoryne* spp. A temperature of about 75°F (24°C) suits the species best though, provided the change is neither rapid nor prolonged, a drop to 68°F (20°C) or a rise to 80°F (27°C) will do no harm. Another thing, although a pair of *A. vexillifer* will live in amity with other fishes (small, inoffensive ones, that is) it is better in every way to give them a tank to themselves. A tank measuring about 18 in. by 10 in. by 10 in. will suffice for a pair. It is

important to ensure that the cover glass fits quite closely at the sides for the fish is an excellent jumper.

It is the custom of *A. vexillifer* kept in a tank to their liking to deposit tough-shelled, adhesive eggs in tangles of thickets of plants at irregular intervals throughout the year. Spawning usually takes place close to the floor of the aquarium and, though the female seemingly extrudes only one egg at a time, as many as a dozen or more may be laid daily for a week, or weeks, on end. Sometimes a pair may choose to spawn at, or near, the surface as well as near the floor below. It seems hardly necessary to add that the colours of the male literally glow when spawning is in progress.

As a rule, well-fed fish take little or no interest in their eggs or newly-hatched young, which appear after about sixteen days have passed. The two absolute essentials for raising the fry are clean conditions and frequent feedings of live food grading from *Infusoria* and brine shrimps up to the tiny thread-like worms. As the eggs of *A. vexillifer* are deposited on different days over a short or protracted period, it follows that the incubated fry vary considerably in size, and to prevent overcrowding and bullying or worse (cannibalism is a common occurrence among a lot of different-sized fry) it is a good plan to remove the more robust-looking youngsters to fresh quarters every now and again. Another point to bear in mind is that the fewer fry left in the tank to tempt the parent fish the better.

Aquarists who are greedy for fry should remove the eggs daily to shaded jars of the right quality water maintained at spawning temperature. Any eggs that develop fungus must be removed as soon as noticed to prevent the organisms spreading to their neighbours. As the fry emerge they should be removed with the least possible delay to one of a series of small growing tanks. With proper care and attention, the fry reach a length of about an inch before six weeks are out. Maximum size should be attained in about six to nine months.

Lagenandra thwaitesii

by LEBISTES

LAGENANDRA *thwaitesii*, a swamp or bog plant indigenous to Ceylon, makes a highly attractive addition to the decorative tropical aquarium; for, like so many of its near allies the *Cryptocorynes*, it produces handsomely marked and extended lanceolate leaves which, provided there is no disturbance at the roots (an event rare, though it will not damage the plant permanently, will lead to a rapid deterioration of the existing foliage), will last in full beauty for months on end.

At the start of their lives, that is to say when they unfold from the purplish stems, the leaves are bright grass-green. But as they age and increase in size, they darken to deep blue-green relieved by an irregular band of silvery grey along the crinkled-edged margins.

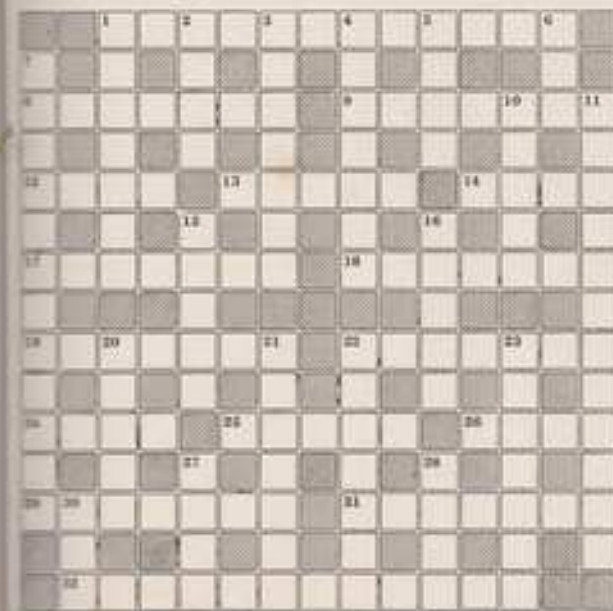
The essential requirements of this species are soft, acid water, a temperature above 70°F (21°C), and a rather subdued light. One other point worth noting is that it does ask for a bedding medium richer than grit or sand

alone before it can be seen at its best. A most satisfactory mixture may be made from equal quantities (by volume) of moist peat, grit and dried and pulverized clay. Sufficient of this mixture should be placed in a glass or earthenware dish to half-cover the roots of the plant, after which a layer of grit or, better still, small gravel should be added to prevent the fish upturning the peat and clay.

Naturally after the container has been introduced into the aquarium the parts that show should be hidden from view behind a screen of smaller growing plants. (*Sagittaria subulata* and *Vallisneria spiralis* are well-suited to this purpose).

In the aquarium *L. thwaitesii* seldom exceeds a height of 10 ins., but taller specimens are common in the wild. Propagation is easily effected by dividing a large plant at the crown and planting each piece with a stem or two and some roots afresh.

The AQUARIST Crossword Compiled by L. BRADLEY



CLUES ACROSS

1. *Colia fasciata* (5, 7).
2. Precious stone from *Cichlasoma bolivianum* (7).
3. *Ateloceratops monophthalmus* (4, 11).
4. And French team is within but get out through it (4).
5. They are in the opposite of 21 down (5).
6. Much current becomes moist (4).
7. Vow of (7).
8. ——— Rainbow. In Latin *Rainbow* *arcus* (7).
9. One-eyed crustacean useful as live food (7).
10. Niece (7).
11. Barden due to removing a pet from 3 down and shuffling the remains (4).
12. Bird (5).
13. ——— but twice shy (4).
14. Live fish food within the order of the Clariidae (7).
15. Intercoster (7).
16. *Euphorbia helioscopia* from Russia? (3, 9).

CLUES DOWN

1. Air ring (anag.) (7).
2. He arrived on earth by beholding maiden (4).
3. Larva of *hemaphysalis* (7).
4. Blinks by mouth (7).
5. Leap to remove one hundred from 20 down.
6. Fruity (3).
7. *Hemichromis bimaculata* (5, 7).
8. There is country to the east for this antelope (5).
9. Sovereign of the charaxes (7, 9).
10. 31 across.
11. Why (5).
12. Give credit to a Member of Parliament for producing this tool (5).
13. Highest female voice (7).
14. Seed by the name *Stenopeltis nigrofulva*? (7).
15. Bottom region of waters (7).
16. It is on it, this burden (4).
17. Ambassis ——— (Indian glandfish) (4).
18. 4th oxygen, 15th nitrogen (3).

Solution on page 84



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

AT the last three meetings of the Northwich and District A.S. lectures have been given by Mr. Gubbey of Chester, Mr. Stridals of Crewe and Mr. Millington, the secretary of the Chester Society. This last lecture was illustrated with interesting films of salmon stripping on the Dee and of merlet fish.

The Northwich Society is most grateful for the support it has received from Mr. Gubbey and his friends, to help it over its first few difficult months.

RECENTLY the Portsmouth A.S. were hosts to Brixham, Brighton, Bournemouth, Datchet, Gosport, Isle of Wight, Mid-Sussex, Reading, Ramsgate and Seaford, Salisbury, and Southampton Aquarists Societies, at an inter-club table show. The classes were: barbs, characins, tetras, rainbowfish, labyrinth, livebearers, delfids, danios-carpe-salmones, single tail goldfish and twin tail goldfish. Each club was limited to twelve entries in the show, and a plaque was awarded to the club with the highest number of prize points. The results were, as follows: 1, Portsmouth A.S.; 2, Gosport; Brixham A.S. and Ramsgate and Seaford A.S.; 3, Reading A.S.; 4, Gosport; Datchet A.S. and the Isle of Wight A.S.

THE Newcastle Guppy and Livebearer Society held its presentation to the winners of the eight Jar Shows Competition, recently the result being as follows: 1, R. Skyles, 45 points (Gold Plaque); 2, N. Little, 40 points (Silver Plaque); 3, J. Read, 35 points (Bronze Plaque). Mr. W. Cunningham was the winner of the Late Thompson Trophy for the second year running. This trophy being awarded to the member gaining most points over the year. The result of a table show of main guppies was: 1 and 2, R. Skyles; 3, J. Read. Anyone interested in the club should contact Mr. W. Cunningham, Secretary, 30, Greenway, West Denton, Newcastle-on-Tyne.

THE South London Section of the Fancy Guppy Association held their annual general meeting recently and with most of the 34 members present in addition to visitors, the show bench was well supported. The new committee elected for the following year was as follows: Chairman, Mr. R. Simmons; Vice-Chairman, Mr. A. Jackson; Secretary, Mr. A. Goodall; 44 Roddell Estate, London, S.E.19; Treasurer, Mr. A. Tatum; Show Secretary, Mr. H. Gwyer; and Show Secretary, Mrs. J. George; P.R.O., Mr. H. Masella; A.S.L.A.S. representative, Mr. G. Ross.

The class winners were: Multi-ends, B. Collier; fanella, Goodall and Masella; delfid, Goodall and Masella; s.v. sword, A. Tatum; flag and scarf, B. Simmons; s.v.v. poles, T. Thax; coxer males, Goodall and Masella; waffer, G. Ross; redgirdler, D. Curry; scoldtail, R. Biggs; original, A. Jackson; s.v.v. female, G. Ross; four matched males, Goodall and Masella (Gold Star); two matched males, Goodall and Masella (Gold Star).

The nomination for the best entry was awarded to Goodall and Masella and two silver badges were awarded to Mr. R. Collier and Mr. G. Ross.

AT the May meeting of the Valley A.S. Mr. Shore gave a lecture on organizing an open show, and the Society, which has yet to have

its first open show, received a great deal from a most informative talk.

Mr. Shore then went on to give some good constructive criticism on the running of the table show, which was done by two of the members. The class of delfid and minnow was won outright by Mr. W. Armstrong who gained first, second and third place. In s.v.v. minnow first was Mr. R. Swales, with a halfbanded barb, second was Mr. H. Goodchild, with a dwarf guppy, and third was Mr. C. Ellis, with a red swordtail.

A RETURN match took place recently between Kingston A.S. and Crawley College A.S. and was judged by Mr. G. D. Foster, F.R.A.S. The results were: 1, Mrs. J. H. Partridge (Crawley), *Nannostomus equidens*; 2, Mr. Goodchild (Kingston), *Betta sword*; 3, Mr. T. Guggin (Crawley), *Corydoras paleatus*. Kingston won the winner with 1,223 points to Crawley 1,198 points.

THE second annual open show of the Heywood and District A.S. was held recently and the following is the list of awards: A.V. goldfish: 1, R. Bush (Heywood); 2, E. Davis (Heywood); 3, T. Butterworth (Gosport); 4, J. Setton (Ossett); 5, Mr. H. Hoag (Salford). Minnow: 1, Mrs. Wandle (P. & Bury); 2, Mr. Gardner (Ottensand); 3, Mr. Reynolds (Swillington). Swordtail: 1, Mr. Wood (P. & Bury); 2, B. Whitmore (Stockport); 3, Mr. Cross (Blackpool). Plagues: 1, O. Rich (Stockport); 2, L. McCourt (G. & Opreman); 3, Mr. Hamill (T.A.B.). Barbs (small): 1, 2 and 3, F. Gregory (Ossett). Barbs (large): 1, Mr. Kilner (Heywood); 2, H. W. Hughes (T.A.B.); 3, M. Spencer (Heywood). Labrus and sharks: 1, Mr. Williams (Valley); 2, H. Wilshaw (Ossett); 3, Mr. Gardner (Heywood). Leachet: 1, Mr. Gardner (Ossett); 2, K. Hill (Heywood); 3, Mr. Grundy (Lough). Catfish: 1, L. McCourt (G. & Opreman); 2, H. W. Hughes (T.A.B.); 3, K. Wilshaw (Ossett). Anabantid: 1, Mr. Pook (T.A.B.); 2, Mr. Ralston (Lough); 3, K. Hill (Heywood). Fishes: 1, Mr. Jennings (Bury & P.); 2, Mr. Kay (Huddersfield); 3, Mr. Muller (Marsden). Clitellid (small): 1, Mr. Mather (Ossett); 2, Mr. Parley (T.A.B.); 3, Mr. Muller (Marsden). Clitellid (large): 1, 2 and 3, Mr. Mellor (Ossett). Anguis: 1, J. Wood (Heywood); 2, G. Hodgkinson (Gosport); 3, J. Logan (Gosport & O.). Characins (small): 1, Mr. Gregory (Ossett); 2, S. Collins (T.A.B.); 3, T. Mallon (Catherine). Characins (large): 1, H. W. Hughes (T.A.B.); 2, Mr. Pook (T.A.B.); 3, Mr. Muller (Marsden). Characins (medium): 1, Mr. Winer (Marsden); 2, J. Robinson (Marsden); 3, A. Pausley (Stockport). Toothcarp: 1, K. Wilshaw (Ossett); 2, R. Reynolds (Swillington); 3, J. Robinson (Marsden). Delfid: 1, T. Gwyn (Heywood); 2 and 3, A. Beasley (Heywood). Rainbow: 1, F. Gregory (Ossett); 2, J. Robinson (Marsden); 3, H. Jones (Marsden). Broodier, livebearer: 1, J. Setton (Ossett); 2, W. J. Horton (Salford); 3, Berrisford and Jeffrey (F.G.A.). Broodier, egglayer: 1 and 2, K. Wilshaw (Ossett); 3, Backley (Bury & P.). Pairs, livebearer: 1, F. Reynolds (Swillington); 2, G. Rich (Stockport); 3, W. T. Horton (Salford). Pairs, egglayer: 1, F. Gregory (Ossett); 2, L. McCourt (Gosport & O.); 3, Mr. Helms (Aldbrough). A.O.V. tropical: 1, G. Hodgkinson (Gosport); 2, Mr. Helms (Aldbrough); 3, D.

Kilner (Heywood). Juniors—A.V. tropical: 1, F. Hodgkinson (Gosport); 2, J. T. Smith (Ossett); 3, T. Helms (Heywood). Juniors—A.V. coldwater: 1, England and Rochester (Heywood); 2, F. Taylor (Heywood); 3, S. Birch (Heywood).

The Fancy Guppy Association ran a show in conjunction with the Heywood Show and Mr. H. Bradford won the best in show award in this section. The shield for the Society gaining most points was won by the Ossett Society. The Waterscrob Shield for the member of the Society who worked hardest for the Club during the previous twelve months was presented to Mr. J. Wood, the retiring secretary, and who is now the treasurer of the Society. Club meetings continue on the first and third Thursdays of the month at the King's Hotel, Heywood, and anybody from other societies will be made welcome.

AT the recent meeting of the Accrington and District A.S. the members listened to a very interesting lecture on the marine life on which showed around Manxcombe Bay. The lecture was given by that well-known authority on marine life in that area, Mr. Jones of Mersey-cumbe. He also illustrated his lecture with some very fine colour slides. His collection of preserved specimens was also much admired by the members.

The results of the table show were as follows: Any coldwater fish: 1 and 2, Mr. H. Smith; 3, Mr. J. Hodgson. Any delfid: 1 and 2, Mr. C. Whalley; 3, Mr. Lally.

THE Hastings and Beahm A.S. announces a change of secretary. The new secretary is Mr. R. Golding, 118, Ashburnham Road, Hastings, Sussex. Other officers elected at their recent annual general meeting were as follows: Chairman, Mr. F. Smith; vice-chairman, Mr. I. Martin; assistant secretary, Miss V. Rogers; treasurer, Mrs. F. Martin; committee, Mr. K. Doe and Mr. R. Rannar. The chairman then presented the following awards: Table show—plaque: B. G. George; rainbow, Miss I. Turner; characin, Miss V. Rogers; labyrinth, P. Martin; Home Aquaria Cup, C. George and A. McCormick; Bagnopore Bowl, C. George; A.O.V. Cup, A. McCormick; Clitellid Challenge Cup, C. George. Published Aquarist Shield, G. Hargrave. Member of the Year Cup, C. George.

AT the two latest meetings of the Uxbridge and District A.S. members enjoyed a quiz between the amateurs and the expert, the amateur running out as worthy winners. The chairman commented that last time a quiz was held many questions were not answered, whereas, this time very few were not answered. The next quiz will certainly have to be stiffer.

The third table show of the year attracted thirty-four entries and was a winner with: Egg-layer tooth carp: Mr. McGaw, with a Jordanella fishbowl. Characin: Antonia Tuzantia entered by Mr. Summers; Labyrinth: Mr. Lee, with a thick lip guppy; Mr. Wiley won the swordtail class with a red sword. The novice class went to Mr. Sheel, who entered a Burzee Anis tetra, and the brooder class was won by Mr. Fitzwater with red plays.

Although no open show is being held this year members will be able to put furnished aquarium or display in the horticultural marquee at the Hillingdon show, as a good display is hoped for. Owing to the rapid increase in the membership and the small club premises it has been decided to limit the numbers to seventy-five. However, a waiting list will be formed and interested members will be able to put their names on it. A coach outing to Hayling Island has been planned for the 24th July.

RECENT activities of the Swindon and District New Aquarist Society have included an inter-club competition with Bath and Towbridge, at Bath, where a good social evening was had by everybody, with Towbridge coming out easy winner. The club evening meeting held on 19th May was spent looking at over one hundred slides on tropical and coldwater fish. The interesting points about the slides were their unusual size of 4 in. square. The club committee went to some lengths in obtaining the very finest

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continued on page xvii

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