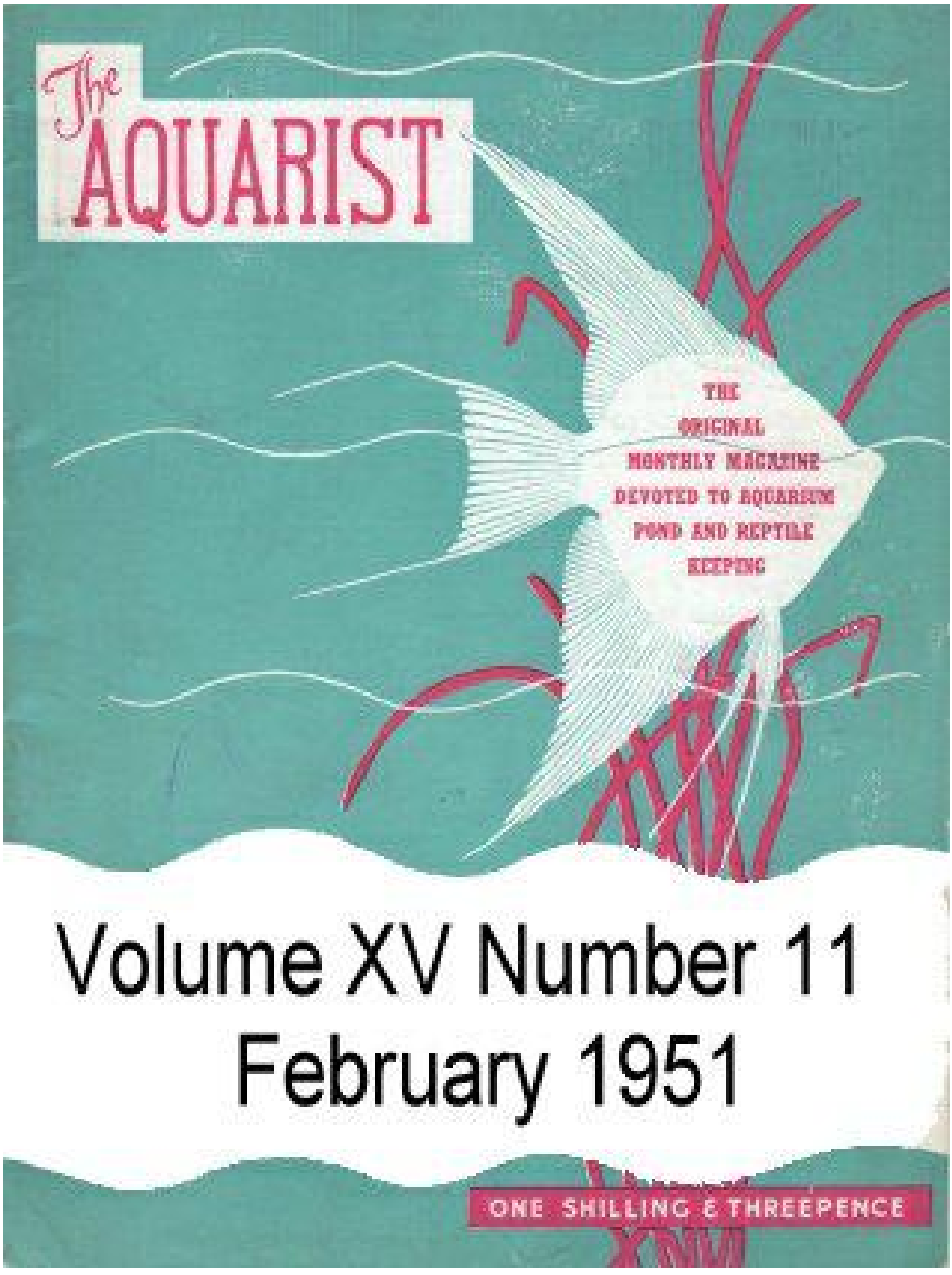


Volume XV Number 11
February 1951

ONE SHILLING & THREEPENCE

The AQUARIST
AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"

[illegible], HALF ACRE, BRENTFORD, MIDDLESEX

PUBLISHED MONTHLY

Editor: ANTHONY EVANS

[illegible] Editor: A. FRASER-BRUNNER

VOL. XV No. 11 1951

[illegible]ments concerning our Hospital Aquarium Fund [illegible] in this issue. Leicester Aquarist Society's [illegible] seen above presenting the society's tank to a [illegible] hospital, writes about the Fund on page 221.

Editorial

IN the Official Catalogue of the Great Exhibition, 1851 there appeared an apologetic foreword regretting the booklet's incompleteness and imperfections and giving as reason for this the reduced time given to its preparation "occasioned in a great measure by the delay of the return of forms."

At the British Aquarists' Festival this year there will be a special souvenir booklet containing useful information about the hobby, about exhibits, and listed names of exhibitors. No apologetic notes are required for *our* Festival literature, so for this reason as much as any other we are asking for early application for and prompt return of Festival Show Schedules and entry forms, obtainable from our Show Secretary, Mr. R. O. B. List.

It is to be stressed that entries are sought from aquarists who are not members of societies as well as from organised bodies and individual members. Distance need deter no one. Manchester's Belle Vue, site of the Festival, is easily accessible from all parts of Britain. It is only 189 miles from London, 225 miles from Glasgow, and can be reached by road, rail and airway. Arrangements are planned so that fishes entered in the Festival Show can be sent unaccompanied, by rail on selected fast trains from main stations, and the trains will be met at Manchester. Rail return of exhibits at the close of the show by advised trains will also be undertaken when requested beforehand. Individual attention will be given to intending entrants having special travel and carriage problems who write in about them.

Particular importance is attached to this facilitation of exhibiting by aquarists out of the immediate Festival area, for this national undertaking will be the first time that fish and plant stocks and breeding results, in different parts of the country, have been put together in numbers and subjected to close comparison by expert judges. Most of the shows on any large scale in the past, with the exception of those of Nottingham Aquarists and the Scottish Aquarium Society, have been held in the south, and even so many

northern aquarists have regularly entered their stocks. We know that southern aquarists will be keen to show their fishes at the northern venue of the B.A.F. for this reason.

We wish, too, to see aquarists from all over Britain at the Festival not only in spirit but also in the flesh ! There will be plenty of attractions in the Exhibition Hall for visitors and a trip there will be a memorable occasion for any aquarist or pondkeeper. The Federation of Northern Aquarium Societies has formed a Hospitality Committee to seek the help of Federated society members in offering hospitality of aquarists' homes to aquarist visitors to the B.A.F. who have to travel specially long distances to attend. Offers of hospitality of this sort for the Festival period will be gratefully received from Lancashire and Yorkshire readers.

* * *

Several societies have already told us that they have arranged train and motor coach outings for members and their families to visit the B.A.F. This is an idea that other societies may like to take up. We are negotiating with British Railways for reduced fares to operate for organised parties. Society secretaries will find that local coach companies will readily give details of their hire charges and that for even long journeys the cost per head is quite low. Parties of twenty-five or over are to be admitted to the Festival on tickets at reduced prices, to be ordered in advance.

A visit to the Festival at Belle Vue can be made a day's outing for the family with every confidence, for admission prices include all the amenities of these famous pleasure gardens of the north, and the amusement and catering facilities there are excellent. Parties of aquarists travelling together should notify the Catering Department at Belle Vue of their meal requirements in good time before the visit to make certain that their day's trip will be a well-organise and enjoyable occasion.

Festival Show Schedules and Entry Form are now obtainable from Mr. R. O. B. Lis 31, Coronation Court, Willesden Lane, Londo N.W.6. Early notification of entries is r quested please !

* * *

Organisation of the show side of the Festival being looked after by an Organising Committe which, in addition to members of the Festival Executive Council (Dr. J. F. Wilkinson, Mr. G. T Iles, Mr. C. Graham and *The Aquarist's* editorial an executive representatives), who are *ex officio* member of the Committee, comprises the following prominen northern aquarists:

Messrs. J. Ellwood and T. S. Warburton (Bell Vue Aquarium Society); Mr. E. A. Sampson (Black pool Aquatic Society); Mrs. P. D. Hammond (Doncaster Aquarists' Society); Mr. H. Loder (Eas Lancashire Aquatic Society); Messrs. H. Charles an S. W. Cooke (Leeds Aquarists' Society); Mr. E Chapman (Sheffield Aquarists' Society); Mrs. A Ledger (Urmston Aquarium Society).

* * *

One section of the Festival for which we are now inviting entries is that of photography. It is intended to have a display of photographs of aquatic and herpetological interest and photographers wishing to place work in this section should write in without delay. Photographs may be of fishes, water plants, aquaria, ponds, water gardens, aquatic invertebrates, reptiles, amphibia. The address of the Exhibition Offices of *The Aquarist* is 24, Wood Lane, Isleworth, Middlesex ('Phone: HOUnslow 9301).

Photo: Valerie Lilley

Furnished Aquaria

—a special feature

PROVISION has been made for ninety furnished tropical and coldwater aquaria at the B.A.F., and good support for this feature—a good aquarist-recruiting medium and one always popular with established aquarists, is hoped for. Classes are given in the Festival Show Schedule, entries being invited from individuals, societies and other bodies. Tanks are provided and will be set-up by entrants in the Festival Exhibition Hall. Considerable scope for novelty and ingenuity in design exists in this sphere, and for the Festival's Best Furnished Aquarium an unique prize, the like of which has not been awarded before at any aquarium show, has been kindly donated by Messrs. Cussons and Sons & Co. Ltd.

Zebra Among the Cichlids

by JACK HEMS

l us, among other things, that in general the re the big fellows of the aquarium and that . The trouble with this piece of knowledge t to influence the newcomer away from an (except its genus *Pterophyllum*) that have m than all the rest put together.

tion that large aquaria are necessary to house cies (bar the few dwarfs), I venture to say that swimming space makes for happier domestic en the sexes and (given proper and sufficient maximum growth, there is no reason why nks of, say, seven gallons capacity should o accommodate single pairs of all but the st belligerent kinds.

g a tank for cichlids, it must be borne in spawn on smooth surfaces, or at the bottom ed depressions fanned in the sand. They are es, and like to choose their own slab of rock on of different sized and different coloured d by the kindly aquarist.

s can tolerate submerged vegetation. To the em, all forms of plant life suggest a lurking ies (in the wild, larger species of fish and fish- and as such is uprooted as quickly as its tected. All the same, it is possible to keep foliaged plants with extensive root-systems uarium ; but do not imagine for one moment e able to grow any of them to perfection, for asking too much from fish whose jaws are gh to crack a snail's shell into splinters, or ength of slate through the sand from one end m to the other. Furthermore, cichlids create muddy sediment.

Fast-moving Cichlid

nigrofasciatum from Central America is one of inating members of the family. European it the zebra cichlid, but American hobbyists o it by the elusive name of Kongo cichlid. grows to a length of between three and four will breed when only half the latter size. ichthyologist Günther described the fish ury ago, it was not until the early part of the e species became known or available to the rld. Until then its scientific appellation had applied to the larger, rather inactive and more ck Dempsey "—*C. biocellatum* Regan.

cichlid is not a sedate swimmer. It dashes arium at express speed, usually from one rock s though its very existence depended on these eys. In between times, the fish is very fond er archways of piled rock. It is easy to feed : , uncooked or cooked, coarse-grained packet all snails, worms and so on are taken with . What it cannot consume on the spot it will its hiding place among the rockwork, there to e.

ch of the imagination can the species be termed ered fish. From early days it acts the bully : t for the zebra cichlid. At an inch long it ke an enraged bull at any fish that is enjoying

Photo: Valerie Lilley

A pugnacious appearance typical of the large cichlids is shown by this zebra cichlid

its food, or goggling innocently through the glass of the aquarium. It relies on its domed, battering-ram of a head to knock submission into its companions. At two inches it should be given a tank to itself. But there is no question that a pair of zebra cichlids will give the aquarist plenty of entertainment. If a true pair cannot be obtained from a dealer, it is a good plan to buy several youngsters and wait for them to sort themselves out.

The ground colour of this fish varies from old ivory to light grey, shading down to lighter underparts. Several dark bars adorn the sides and extend into the dorsal fin. Golden-yellow patches ornament the spaces between the bars on the upper back ; yellow patches are also present between the dark markings on the dorsal fin. The serrated edges of the dorsal and anal fins are lined with emerald green. A greenish sheen also overlays the head. The scales on the breast flash silvery gold. The ventral fins are sooty black ; the tail fin is translucent grey. A dark marking covers the root of the tail.

The black markings appear and disappear according to the mood of the fish. At its handsome best, it rather resembles a dusky coral fish. Its custom of hovering over rockwork with its gold-rimmed, beady black eyes intelligently alert adds to the deception. Strangely enough, the plumper-sided female has the richer colours. She is also more of a bully than the male and often keeps him well down among the rocks.

Family-raising

Eggs are almost always deposited where the aquarist cannot see them—in holes scraped away behind rockwork, or in dark caves. The very fact that the fish seem to be spending most of their time fussing about in some shady crevice usually denotes a family. With all their faults zebra cichlids are good parents, and one always stays on guard while the other swims to the front of the aquarium to receive food ; and having snatched a mouthful of whatever is on the menu, the fish will streak back to the nursery so that its partner can take a turn.

The babies, which in the first stages of their development resemble a vibrating greyish to brownish jelly, become free-

Heat Treatment for Disease

by Dr. A. STOLK

Translated by W. J. VAN DER KOLK

In general we can distinguish three methods in the treatment of fish diseases: (*a*) the chemical method (baths in solutions of kitchen salt, formalin, sal-ammoniac, ammonia, permanganate of potash and hydrogen peroxide); (*b*) the biological method (placing the fish in oxygenated surroundings, with the desired acidity, the application of various baths); (*c*) the physical method, of which we can consider the application of heat, by increasing the water temperature, as the most important.

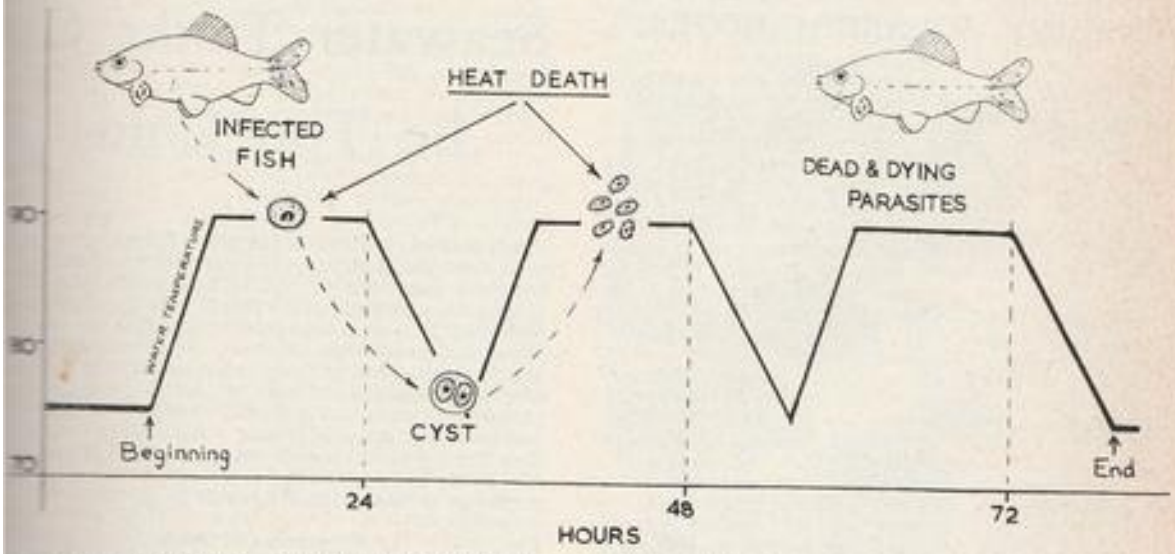
In this article I want to draw particular attention to heat therapeutics. The treatment deserves full mention for, though the biological method may play a big role in the treatment of "air-bubble disease," carbonic acid poisoning, suffocation and all possible injuries, it is not effective for infectious diseases. The chemical method can be applied with success in a number of cases. This latter method, however, demands a great measure of accuracy: the solution must be of the right concentration, and the duration of the bath has to be fixed accurately. Moreover, there are several fish diseases known in which almost all chemical means have failed.

In this connection, we think of the well-known fish disease, perhaps most feared by all aquarists, "white-spot," which is caused by the ciliate *Ichthyophthirius multifiliis* Fouquet. With regard to this disease, Mr. van Laar in his book *Diseased Aquarium Fishes* writes the following:

"All kinds of remedies are mentioned to combat the dreaded white spot disease. It is wise, however, to accept these remedies with the greatest reserve; for only one remedy we must make an exception, viz. the raising of the water temperature to 30 or 32 degrees Centigrade. According to reliable informants, good results have been obtained with this method. It is an old remedy, which had fallen into oblivion, but to which the younger generation is again paying attention."

I have applied this method with not quite satisfactory results. In many cases I succeeded in eliminating the white spots, but after some time a "relapse" often set in and I had to start again from the beginning. This experience induced me to use the intermittent application of heat instead of the continuous application. By this method the water temperature is changed in turn, from normal to a higher one and then back again to normal. By tracing the development of the parasitic ciliate, we can fairly well explain the relapses occurring in white spot disease.

Ichthyophthirius, which can be brought into the tank with live foods (*Tubifex*, *Daphnia* and bloodworms), attaches itself to a fish and penetrates the epidermis. The latter reacts to this contact; small "bubbles," the white spots, that are found in great numbers on the skin and fins of the affected fish, arise around each parasite.



After having lived in a "bubble" for some time, the single-celled parasite, which consists of an almost globular lump of protoplasm possessing a cell-mouth, cell-anus, a macro-nucleus, a micro-nucleus and a great number of contractile vacuoles situated at the surface, leaves the "bubble" to rest on the bottom of the tank and form the so-called "cyst." In this cyst a process of division of the *Ichthyophthirius* takes place, with the result that often more than a hundred new parasites enter the tank. They possess an oblong form and are covered with many hairlike vibrating organs (cilia) by which they move spirally through the water. When they reach a fish, they penetrate the epidermis, become round in shape, and with this the cycle is completed.

Encystment of the parasite on the aquarium bottom

Some Facts About Aquarium Water

by G. F. HERVEY

(*Continued from page* 199, *January issue*)

It has been argued that testing water for pH is not worth the trouble involved. To some extent I agree. If the fish are in health and active no one but a fool would tamper with the pH value of the water. It has to be remembered, however, that some fishes (e.g. *Rasbora*) thrive best in acid water, others (e.g. *Corydoras*) in alkaline water. For the purpose of breeding, therefore, it may be necessary to adjust the pH value of the water in order that conditions in the aquarium shall approximate as closely as possible to the natural conditions favoured by the fish.

To adjust the pH value of water artificially, sodium bicarbonate may be added if the water is too acid, and sodium dihydrogen phosphate if the water is too alkaline. It has been noticed that when sodium dihydrogen phosphate is used it leaves an unsightly precipitate on the surface of the water. It is due to the slow precipitation of calcium phosphate coupled with a gradual loss of carbon dioxide, accompanying a corresponding increase in the pH value of the water. Most water contains appreciable quantities of dissolved calcium carbonate and bicarbonate; these are converted by sodium dihydrogen phosphate into calcium phosphate, sodium carbonate and bicarbonate, and free carbon dioxide. It is this last which is gradually removed. The precipitate may be obviated by using potassium hydrogen tartrate (cream of tartar) instead of sodium dihydrogen phosphate, since calcium tartrate is reasonably soluble. Actually, however, the only way to avoid an increase in pH, due to loss of carbon dioxide, is to decarbonate the water (by boiling it for about fifteen minutes) before adjusting it with potassium hydrogen tartrate as required.

When adjusting the pH value of water, strong alkali (e.g. sodium hydroxide) or strong acid (e.g. hydrochloric acid) should never be used; for even when greatly diluted they may prove harmful to the fish. The chemicals recommended will not harm the fish in the quantities likely to be used, but it is important to observe that chemicals must not be added to the water haphazardly. A small quantity of the chemical should be added, at intervals of half a day, and the pH measured after each addition. Care must always be taken never to alter the pH value of the water suddenly; it is dangerous to subject a fish to a pH change of more than two-tenths on the scale per day, taken in two steps of two-tenths each. This is one of the reasons why experienced aquarists, when changing the water in an aquarium, take the precaution to draw the fresh water from the same source as they drew the old water; and why, before introducing newly-acquired fish into an aquarium, they acclimatise it to the water in which it is to be kept, by one or two partial changes of water.

But, in fact, except for special reasons, experienced aquarists do not greatly trouble themselves with determining the pH value of water. They take the precaution to fill the aquarium either with natural water (that is, water drawn from a safe pond, stream, or water butt) or with tap water that has been matured or boiled, and to replace water lost by evaporation with distilled water or water that has been boiled. It is proper to replace water lost by evaporation with distilled or boiled water; for the salts do not evaporate. It follows, therefore, that if losses by evaporation are made good from the tap, or other source, in time the water in the aquarium will have too high a mineral content.

For the rest, they judge the quality of water more by eye than by any chemical test. Good water should be of a greenish-amber tint, and have a beautiful crystal-clarity that is so different from new clear water drawn from a tap, and yet so difficult to describe. Unhealthy water may be recognized by its faint bluish tinge and oily clarity: such water lacks essential mineral salts and should be changed at once. Writers on aquarium management are very fond of recording that " old water is best for fish." This, however, is rather misleading; for the fact that water has been standing for a long time does not necessarily ensure that it is healthy water, and, by the same token, the fact that water has not been standing for a long time does not necessarily mean that it is unhealthy water.

The plain fact is that if you have a few fish in a large aquarium, plenty of plant life, and sufficient light, the aquarium is biologically balanced and one can speak of the water in it as being old, even though it may have been drawn from the tap only a few weeks before. On the other hand, if the aquarium is overcrowded with fish, insufficiently planted, and receiving too little light, the fish will not thrive, and the water will be unhealthy, even though it may have been standing for years. In fine, it is not so much a case of the water being old or new in length of time, but of the water being healthy or unhealthy.

Very often the water in an aquarium will become cloudy soon after the aquarium has been filled. This should not be taken as a sign that the water is unhealthy. In the process of the maturing of new water many changes in appearance occur. At the first change the water looks opaque, subsequently becoming green. The opaqueness is due to chemical changes. The greenness is due to the presence of algae (most freshwater algae are green), to the development of which new water, because it is usually alkaline, is very susceptible. Infusoria and rotifers bring about a cloudy appearance of the water.

So long as these conditions do not go too far they are to be welcomed; for algae are not only good oxygenators, but they supply the omnivorous fish with a good vegetable food. The time to act is when the water takes on a thick, turbid appearance (just as though a little milk had been poured into the water) and when a faint but unpleasant odour can be detected. Then the water should be changed at once, for if deaths have not already occurred they may be expected at any moment. It is a common practice among inexperienced aquarists to give fish much more food than is necessary for their immediate wants. Pieces of worm, dead flies, dried food, and the like, are thrown into the water regardless of the fact that the fish cannot eat every morsel. That which is left uneaten quickly decomposes and putrefies the water.

The turbidity of the water is due to fungoid growths of a whitish nature, which are the outcome of an exuberance of decomposing nitrogenous organic matter. The condition is popularly known as " sour water." It may occur at any time of the year, but it is more likely to occur in the summer months ; for, as we all know from experience, decomposition is hastened by warmth. But no matter at what time of the year the condition arises, there is no alternative except to take down the aquarium, disinfect everything, and begin again. Under such conditions, a partial change of water is useless.

AQUARIST'S NOTEBOOK:

Pests at the Pondside

HAVE you ever noticed that if you say that something has never happened to you with regard to your fish or pond that soon after, the very thing does happen ? This has been my experience on more than one occasion ; I have only to say that my fishes never do a certain thing for them to do it within a few days. It was not long ago that a visitor, whilst looking at my pond and fantails, said : "Don't you ever lose any fish by cats or birds ? "

I had replied that apart from a cat taking one or two, many years ago, I had been extremely lucky. I have now had another pest to contend with in the shape of a kingfisher. I was working in my garage one afternoon and when looking out of the window towards the pond I saw a kingfisher sitting on a large tank watching the water in a small shallow pond. This pond is only about twelve feet from my house and I could see the bird quite plainly. As I watched, it dived into the pond and returned to the same spot with a small fish, which was quickly eaten. I drove the bird away but it returned four times in about an hour. I saw it take another fish and I noticed that each time it came it settled on the same spot.

The tank on which the bird had perched contained two of my show specimen fantails and as I did not want them to make it a meal I covered the tank over with a wire netting frame. Almost immediately after, the bird returned and appearing quite indifferent to the changed surroundings it settled on the edge of the frame and carried on with its watching. There are few birds which would not have been suspicious at the new object but the kingfisher was quite contemptuous of it. The small pond in question had contained about sixty young fishes. Fortunately they were not good fantails but throwouts which I had removed from other tanks when I noticed them as being of poor quality. After the discovery of the kingfisher I searched the pond but was unable to find one fish.

* * *

I must say that the sight of the bird gave me a bit of a shock. The pond has been made for about fourteen years and during that time I have not caught a glimpse of a kingfisher. I live in a fairly well built up area about fourteen miles from the centre of London. The river Pinn, a small stream, is only about a hundred and fifty yards away and on the day when I first saw the bird the stream was in full flood after recent rain, and the water in it was quite muddy. I should imagine that a bird would have great difficulty in seeing a fish in such water, and that may have been the reason for it finding my pond.

The usual method for the kingfisher to adopt when fishing is to select a prominent bough of a tree, a dead one without leaves for preference, or a post near the water. The bird will use the same perch nearly every day, so if you ever see one perching you can be fairly sure that it will return there if you keep still or hide nearby. When the bird sees a fish it drops quickly into the water. It really does enter the water but is not there for more than a second or so.

The question which aquarists are likely to ask is, " How large a fish can a kingfisher eat ? " The answer is a bit difficult but I think that it can be assumed that a kingfisher can easily eat sticklebacks and also minnows. It will also eat any other young fishes of other kinds that it can catch and I think that a fish about three inches long would be about its limit. They can, however, do damage to larger fish if they do not actually kill them. I have found one of my fantails which has a body length of about three inches with damage marks centrally on each side of the body and it appeared to be the type of damage one would expect from a stroke by a kingfisher. Whether the damage was actually caused by a kingfisher I am unable to say, but the fish was unharmed one day and then the next day I noticed the scars on it.

The bird does not appear to be easily frightened and I do not know what to suggest will keep one away once it has found the pond. I have had to resort to netting, but this is a very difficult procedure if your pond is large. I have often deprecated the practice of taming your pond fish so that they come up for food at your approach, as I am of the opinion that this will make them easy prey for cats and other fishers at the pond ; I always like to see my fishes dart from the surface of the water as soon as I approach. I am sure that many cats get a liking for pond fishes and some are very adept at catching them. A very good way to keep cats away from the pond is to surround it by a bog garden. Cats do not like walking about in water and the provision of a quantity of water, no matter how shallow, will do much to prevent cats from watching for fish. If a cat is continually at a pond an occasional douching with cold water will often scare it away.

* * *

There is another pest which sometimes attacks fish in garden pools and that is the common grass snake. These reptiles, although not poisonous, can eat fish of quite a fair size by stretching their mouths over them. The teeth are set pointing back so that anything held has little chance of escaping. I know of nothing that one can do once snakes find the pond, as netting will not keep them away. Snakes are fond of hiding by day in dark, cool spots; at least grass snakes are, and so the provision of a suitable cover which can be inspected occasionally may trap the reptile. I have known several pondkeepers who have been worried by grass snakes and in some cases they have cleared the pond of fish, and some of these ponds have not been in the open country by any means. If a pond were made with the edges raised with an outward curve near the top this would prevent a snake from climbing in but it is of little use to the owner of a pond already made.

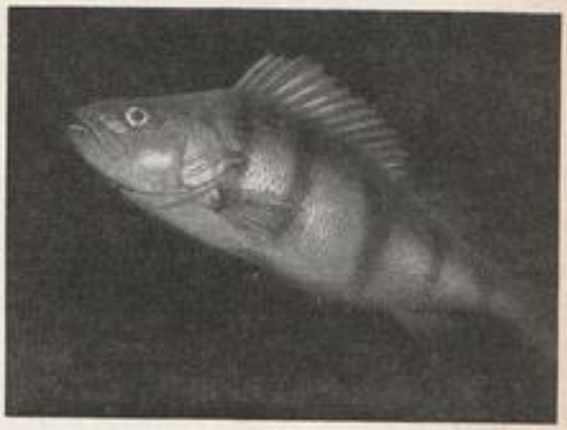
Another bird pest which does give trouble at times is the heron. I think that this bird is not so likely to fish a pond which is very near a house, but they may come early in the morning. Strands of black thread or fine black wire stretched across the pond may keep these birds away. Some birds do not appear to see these black threads whilst others will walk freely among them. A heron can eat a fish up to a pound weight and where one finds a pond of fish then it may return often enough to clear the pond.

Aquarists living near the sea coast may get trouble from seagulls and this trouble may not be confined to near the coast. Nowadays the seagulls appear to live as much inland as they do near the sea and it is only necessary to watch ploughing to see the large numbers of gulls following the plough for wireworms, etc. With all these possible pests it is a wonder that we manage to breed any fish at all in open ponds yet over the past fourteen years I have lost very few fish ; I always hope that those fishes taken may not have been the strongest and fastest. A happy thought, but I wonder if it is true ?

A. Boarder

Savage Stripes from the River

by EDWIN LEWZEY



Although a menace to all small fishes the perch can be quite a tame aquarium subject

AS to an angler the other bank of the river always harbours the best fish, so to the aquarist fish from abroad seem to have the greater appeal than our native ones. Yet a comparison for general attractiveness in colouring, habits, and adaptability is certainly not odious to those in our own rivers and ponds. Since our natives are more easily come by, they should have the merit, if all else is denied them, of being cheaper. Size, too, is not so limited as for the imported fish, as transport for them does not impose so many conditions. Perhaps we cannot expect the thundertish, bitterling, catfish, sunfish, and bass to disappear in favour of our loach, gudgeon, miller's thumb, ruffe, and perch, but although some dealers supply British fresh water fish how many of you reading this have seen even a picture of a ruffe or a barbel ?

A Glorious Fish

Of our natives, one of the most striking in appearance is the perch. It is common in most of our waters, pond *or* river, since it is equally at home in either. From my experience I believe the perch in a river to have brighter colouring than its cousin in still water. From a clean and unpolluted river the perch is a glory to see. His sides are a light olive green, striped, as is the broad and humped back, with wide bands of black. His fins are tinted vividly with red, setting off the lustre of his golden eyes.

The perch is essentially a flesh eater, although at times it will take a piece of bread sinking in the water. The chief food of those large enough is, of course, the young of other fish, which, by the way, does not exclude its own kind. Worms and water insects are hunted almost as eagerly, but being less substantial in size, and fewer in number, are probably searched for more in the season when there are fewer tiddlers available.

Perch are gregarious, the shoals normally consisting of one size of fish, for although less carnivorous fish also keep to one size, for the perch smaller than the rest of the shoal sometimes would be rather nerveracking. As the fish get older and larger (they are slow-growing by the way) the size of the shoal diminishes, the remainder being, no doubt, the survivors from the rigors of natural selection. I believe very large fish are mostly solitary and take up a regular beat, whereas those of small and medium size are very active in the summer, having fixed and regular swims, although these do shift according to the season.

Chase in the Shallows

The small perch of up to six inches in length is greedy and impetuous, but those of one pound in weight are very discerning indeed and hunt in a very purposeful way, approaching anything suspicious very warily. As the young fish of all kinds keep to the shallows the perch must come inshore to feed on them. It is therefore possible to see a shoal of wild fish feeding. I have often watched this really fascinating sight, and I am convinced that each perch in the shoal moves in slowly and marks its victim. This luckless creature is then literally hounded to exhaustion, the chase being very fast and sometimes covering quite a distance, the small fish leaping out of the water repeatedly to escape its pursuer.

Those which cannot gain the shelter of a stone or weeds are eventually overtaken and swallowed whole, head first. Ailing fish, or those which are not bright enough to seek shelter at the approach of perch, are naturally the first to disappear, for if they are marked out for a meal they will soon be caught, while their healthy and more sagacious fellows may escape to run another day. The food taken is not chewed but goes immediately to the stomach. The teeth of the perch are in the mouth, also on the lips and tongue, and for holding the meal are inclined towards the throat, preventing escape of prey. They are not large, and the mouth to the exploratory finger feels like glass paper.

Dorsal Spines

The spines on the dorsal fin suggest some means of defence, but in practice this seems not to be the case. I once hooked an eight-inch perch from a shoal of many hundreds, all easily discernible in the sunlit water from the bridge on which I was standing. The spined dorsal fin of this fish was fully erect in its alarm. Suddenly from the depths an enormous perch rose and swallowed the struggling and flashing fish, severing my line as it did so. Apart from its disregard of my " catch's " spines it is interesting to note that only an obviously wounded fish was swallowed from a shoal of equally available mouthfuls.

Young perch of two to three inches in length can be captured in the summer from the water's edge with the use of a net. These do well in an aquarium but it is advisable to make your catch from a pond as the river fish is more difficult to keep in still water. Small perch in captivity are inclined to sulk if frightened ; I had one that actually fainted if I came upon it suddenly, turning on its back with all its colours faded. After a while they settle down and feed readily on live worms and grubs. It is advisable to have at least two together, as they seem to gain confidence sooner in company.

Large perch for the outdoor pond are more often and more easily obtained from an angler friend. They appear to take no harm from being hooked and are soon feeding as

(*Continued at foot of next page*)

Shading Shrubs for the Rock Garden

by——————W. E. SHEWELL-COOPER

FOR years now I have been extremely interested in the use of shrubs and conifers in the rock garden. There have been cases, of course, where these have not been used with discretion and so the whole effect has been overpowering. On the other hand, there are rock gardens where the shrubs provide a very useful background for the Alpine plants and where they are so planted that they give shade exa tly where and when it is necessary, plus the right protection. Use the right type of shrub and it can be very effective in the winter time, when most of the normal Alpine plants are not in bloom.

Types of shrubs and their use depends on the size of the rock garden. I hope later on, to be able to mention shrubs which are of a very dwarf character as well as those which can easily be kept within bounds by the careful and proper use of a pair of secateurs. I hate a shrub which has to be kept clipped regularly; there is no place for topiary in a garden of this character. There's something fascinating about the prostrate growing shrub which, so to speak, creeps over a boulder and screens it. As against this, there are what I call the little finnicles—those lovely little conifers which look like baby church spires. Again, there are the deciduous baby shrubs which grow something like a round ball and I always think look like miniature hedgehogs in the winter time, in consequence.

Many of the shrubs bear the most lovely coloured berries, as well as carrying leaves with autumnal tints. Some reader will know the beautiful *Acer dissetum*. This has the most beautiful finely cut foliage and when it is in its autumnal clothing, it always looks to me like some exotic bird. Don't forget that many of the baby shrubs love peat, especially the rhododendrons and azaleas—not only will they appreciate the peat being worked into the soil before planting but also top dressings given each year as they go to bed for the winter.

The shrubs that lose their leaves in the autumn and early winter are best planted in the late autumn though you can put them in any time during the winter; but those who are going in for the evergreen conifers had better order now and plant in April. If we start with the conifers, then I should like to recommend *Picea Albertiana conica*, because it is the most perfectly cone shaped type I know, with bright green foliage densely packed. Its only fault is that it grows rather tall and so usually has to be removed from the rock garden at the end of five or six years.

A baby compared to this one is *Juniperus communis compressa*—this is very dwarf and produces a dense pyramid of fine bluish grey foliage, column like in habit. You can plant a choice specimen which is only five inches high and fifteen or sixteen years later it will only be about two feet high—it grows so slowly. The other juniper that must go in the list is *J. c. prostrate*. This is the low growing prostrate or creeping variety which is never higher than about five inches but which will spread if allowed almost indefinitely. It does best in moist soil but it must be very well drained.

Cedrus Libani nana is a stunted type of very slow growing cedar. The young leaves are bright green; the tallest I have ever seen is three feet and the spread is usually about the same. It has a kind of semi-arching regular appearance. I will just mention one more conifer, and that is *Thuja occidentalis compacta*. This produces an absolute ball of bright green but its fault is that it eventually grows too large. It helps matters if it is dug up every third year and is given a little root pruning before being put back again in April.

However, let us leave the plain evergreens and think about some of the baby flowering shrubs. For semi-shade and for peaty soil, there is *Andromeda polifolia*, which produces its white urn-like flowers from April to August, together with lovely grey leaves. It never grows taller than two feet. *Berberis buxifolia nana* never grows any taller but likes, on the other hand, a sunny spot, producing orange yellow flowers in April and May, followed by the most beautiful purple fruit. *Cassiope tetragona* is fascinating for it bears tiny bell like flowers which hang daintily from the shoots on thread-like stems. The little bushes never grow any higher than twelve inches and they can be a mass of blossom from the end of March to the beginning of June.

Most people like scent and so they will plump for a nine inch shrub *Daphne Blagayana* whose flowers are a creamy white in March and April, while the bushes are not only evergreen but somewhat spreading in habit. *Erica carnea* is, of course, a type of heather which seldom grows taller than nine inches and will give colour from December to May very often. There are suitable varieties which bear white, pink or crimson flowers and it is one of the few Ericaceous types which will put up with lime. *Gaultheria procumbens*, on the other hand, must grow in a limeless soil and preferably in peat. It bears its pinkish white flowers in July and August, with a mass of bright red berries to follow. I have it growing six inches high with three or four in a little group and it is most attractive. The last plant to go in my list must be *Genista sagittalis* because of its golden flowers; it is lovely in June, August and September—a one-footer at the most.

Savage Stripes from the River

(*Continued from preceding page*)

well as ever. They like a deep pool to retire to, probably feeling insecure in shallow water. I regard this as most important for their comfort. The largest of lob worms will satisfy their appetites and they can become very tame indeed. The capacity of the perch illustrated with erect dorsal fin is a dozen of the largest worms I can find twice a week. My brother has a number of perch six to nine inches in length; on the approach of his wife they rise to the surface, turning their heads in her direction whichever way she walks. They take worms from her fingers without fear, although they do not so favour any one else. They obviously have powers of recognition, if not for faces then for clothing. I should add that being a keen gardener she is constantly feeding them.

Perch can be kept quite safely with other fish of half their size and over. My own perch include some twelve inches long. I have frequently seen a score or so roach fry swim unconcernedly by them, completely disregarded. The fry seem to know they are safe and strangely the perch accept the fact. Do perch have a rule about shooting sitting birds ?

Loaches that can Weather Forecast

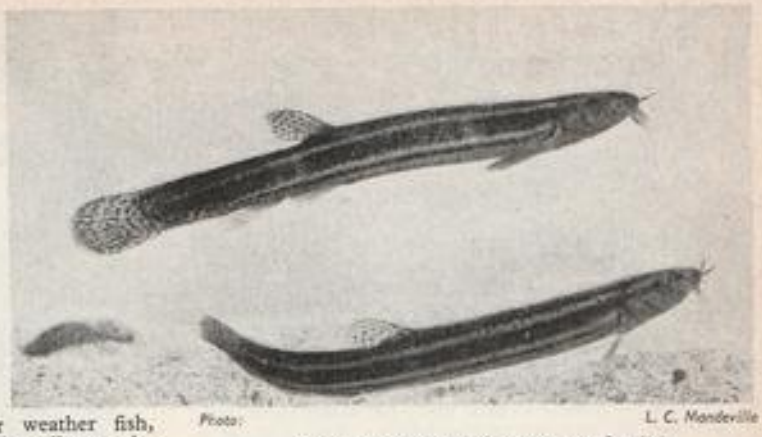


Photo: L. C. Mandeville

European Thunder Fish (Misgurnus fossilis)

TER known as thunder fish or weather fish, ese loaches are popular with aquarists all over the orld.

Germans call the European form (*M. fossilis*) nbeisser, or mud biter, and, like ourselves, employ cavenger in both tropical and coldwater aquaria.

ogaillicandatus, a native of China and Japan, is ted good eating by Oriental gastronomes. They akes a good stew.

his is not to be wondered at seeing that more than turies ago Izaak Walton commended close relatives t," grateful both to the palate and stomach of sick

any Continental homes the European species is kept l tanks to act as a living barometer. For at the h of stormy weather the fish usually becomes very nd swims excitedly up and down the glass sides of rium.

storms don't come every day, and normally *M.* s quite inactive. It is possessed of the rather curious habit of digging itself into the sand, and staying there for lengthy periods with just the front portion of its body exposed to view.

Owing to this habit, large specimens can become rather a nuisance in an aquarium, but small specimens are extremely useful for keeping the bottom clean. They sift the sand very thoroughly for particles of edible matter. That is, edible to fishes. Food is consumed at night-time as well as during the day.

The European species has sides ornamented with horizontal stripes of nigger brown and pale stone or clayey-yellow colour. The Asiatic form is light grey with darker blotches on the body. Both species attain a length of between eight and twelve inches.

Jack Hems.

Aquatic Ferns

TER ferns, of the family Salviniaceae, *Salvinia* and *Azolla*, are curious little plants which at a casual glance would not ordinarily be taken to be ferns at cy are floating plants which are more reminiscent of ds than terrestrial ferns in both size and habit, they have a certain elusive daintiness which is to in both ferns and mosses.

Azolla—" Fairy Moss "

genus *Azolla* is chiefly tropical, but the South n *A. filiculoides* Lam., has become naturalised in es in parts of southern England and Ireland and is likely species to be encountered in collections of plants in this country. It is characteristic of its the tiny branching stem bearing neat rows of succulent leaves, varying in colour from delicate f green to a distinctive red when grown in full The leaves are two-lobed, the lower and almost s lobe serving as a float from which occasional ous roots trail down, whilst the upper green lobe is from contact with the water.

teresting feature about *Azolla* is that the upper ve a special hollow chamber which always contains the blue-green alga, *Anabaena*. This is not a parasite, as experiments indicate that there is true symbiosis. In other words the alga isn't getting " something for nothing " ; it fixes free nitrogen for its host in return for its board and lodging. The host benefits by this arrangement because nitrogen is one of the major elements essential for plant growth.

Azolla filiculoides (X 2)

Reproduction is usually vegetative only, but is quite rapid in a healthy colony. *Azolla* will soon form an attractive carpet over the whole of a small pond or tank if permitted to do so, but as thinning out consists merely of skimming a quantity of plants off the surface of the water this rapidity of reproduction need be no cause for alarm, even if the water has other occupants of greater importance. *Azolla*, being of small size, is equally suitable for indoor tanks or outdoor pools, although it is advisable to keep a few reserve colonies indoors during the winter as it may not be able to survive a severe winter in many parts of the British Isles.

S. G. H.

Plant-like Animals

by Dr. E. ELKAN

ALONG the coast of the North Sea, in the tidal waters of Great Britain, Germany, Holland, and Iceland, the bottom of the sea can, in places, be found covered with a "growth" that has always been well known to fishermen although even they rarely knew what it was. They called it white weed, sea moss or sea cypress, indicating that they thought it was a plant and that it looked a little like moss and a little like cypress leaves.

It covers the ground in beds up to ten inches thick, and it does look like moss or cypress leaves. Yet—it is not a plant, neither synthetic nor natural. It is the external skeleton of a hydroid polyp, *Sertularia cupressina* (*sertula*, *L.*—a garland or a wreath; *Cupressa*—a cypress) and it is now being sold as a decorative plant-like addition for aquaria. By the time we get it, the animals which make up these large colonies, and each of which looks very much like a plumper version of the freshwater polyp *Hydra* we know so well, have disappeared through drying and washing, and under the low-power microscope we only see the pockets in which they have lived.

The external skeleton in which these polyps hide themselves is made of chitin—not of chalk nor of silica. This is the same substance that insects use for making their external skeletons and it is very remarkable to see the same substance put to the same use so much lower down on the evolutionary scale. Chitin is very resistant to chemicals; neither acids nor alkalies in weak concentrations attack it, and it has the further advantage of being pliable, a most necessary quality for anything that wants to last at the bottom of tidal waters.

Sertularia had a short and brilliant career in the days of our grandparents, who loved to adorn their parlours with knick-knacks of all sorts, and who taught their children to make "landscapes" and picture frames from sea-moss. It is known that this fashion goes back to 1755 in England and that we then had an export trade of dyed and natural sea-moss to France and Germany. Round about 1896 German shrimp and crab-fishers started to fish for sea-moss as a side line. They invented a kind of rake and located the sea-moss beds so well that the Kaiser had to issue an edict forbidding sea-moss fishing from April to August. The sea-moss needed time to grow and over-fishing endangered fish which used to spawn in those beds.

The fishermen, however, did what they could: in the 1909-10 season those of the island of Langeoog (one of the Frisian islands) "caught" 500 kg., and in 1916 the U.S.A. imported 150,000 kg. to the tune of 50,000 dollars from Europe. Fashion kings even made the attempt to induce women to have their hats embellished with the sea-cypress. Surprisingly enough this suggestion did not catch on; women refused the mermaid idea, and with the various wars and the change of taste the sea-moss business declined.

Sea moss (Sertularia cupressina) as seen under the microscope (× 30)

Somebody has apparently revived it now, the idea being to supply aquarists with an everlasting plant-substitute on which fish can spawn all the year round, which needs no soil, which can easily be taken out for washing and can be used again and again. My personal experience so far is that it works well with *Xenopus*, and I see no reason why it should not work equally well with fish. But while the fashion lasts let us proclaim the thing for what it really is: the external skeleton of a marine polyp—not a plant.

The Aquarist's Hospital Aquarium Fund

"WE have had no trouble at all with the children since the "tiddlers" arrived. They have responded even more quickly to treatment. Our only problem now is sending them home." So writes the matron of a Leeds hospital for children when thanking Leeds aquarists for the gift of an aquarium.

Evidence of the popularity of hospital aquaria has been amply provided since *The Aquarist's* announcement of the institution of the Hospital Aquarium Fund last December. Letters from doctors, nurses and ex-patients all tell of the value of this interest-therapy to the sick and disabled.

Societies all over Britain have responded magnificently to the appeal for help and many have written to ask how they can aid the creation of the Fund. This form of activity is welcome, and publicity given at local shows or functions with collections from the public, will be greatly appreciated.

Donation forms with explanatory notes and illustrations are available for distribution by societies.

All correspondence should be addressed to Hospital Aquarium Fund, "The Aquarist", 24, Wood Lane, Isleworth, Middlesex.

JR READERS

Write—

lers are invited to express their and opinions on subjects of st to aquarists. A selection from es received will also be answered The Editor reserves the right to en letters when considered neces- and is not responsible for the ons expressed by correspondents.

Address letters:

The Editor, *The Aquarist*,
The Butts, Half Acre,
Brentford, Middlesex.

Hospital Aquarium Fund

me much pleasure when reading your Editorial in cember issue of *The Aquarist* to see that you are Hospital Aquarium Fund, as in December I had re of presenting on behalf of the Guppy Breeders' f the Leicester Aquarist Society a 4 ft. 6 in. by 14 in. furnished aquarium with 60-70 tropical ake a community tank. The enthusiasm with was received by the staff and children of the Ward No. 2 in the Royal Infirmary proved to us ld achieve its object of interesting children passing he ward, both educationally and psychologically. give us much pleasure to help all we possibly ar Fund and we wish it every success.

H. ESTERBROOK, *Chairman*,
Guppy Breeders' Section,
Leicester Aquarist Society

Nannaethiops trilineatus

me to compliment you on your 1951 calendar ing the interesting fish *Nannaethiops trilineatus*. genera *Nannaethiops* and *Neolebias* (mentioned in *rist*, January 1951) are described in great detail in nger's *Les Poissons du Bassin du Congo*. From ption it appears that the chief distinguishing are the absence of the lateral line in *Neolebias* as e maxillary teeth—both of which characters are *Nannaethiops*. There is also a variation in the dorsal fin rays. The fish is classified in the book *Neolebias*.

can accuse Dr. Boulenger of being a "splitter," ace to his works, such as his monograph on the *erta muralis*, would show exactly the opposite. atribution he brought twenty continental species pe *muralis*.

J. LEONARD MONK,
Birmingham.

Aquarium Antibiotics

ountry antibiotics listed in the article "Anti- in Aquaria" (*The Aquarist*, January 1951) are by the Penicillin Act, 1947. For the lay person that they can only be obtained on a prescription fter the supervision of a doctor, dentist or veterin- n.

hmetic in this article is faulty: if the strength of sed was 10 units to a millilitre then this equals ts/gallon.

H. C. B. THOMAS,
Bristol, 7.

logise for the arithmetical error, and thank Mr. pointing it out. The conversion factor for litres 4.546.

Painless Death

MY practice is to transfer the fish to a jar of warm water and place it in the refrigerator (or in winter—merely out of doors) to chill gradually. The fish becomes quiescent and dies without any appearance of suffering.

This seems to me to be the easiest method possible, and kindest to both the fish and his keeper.

MRS. GRACE HUNTER,
Enfield, Middlesex.

Hydra Control

LAST month in *The Aquarist* there was an article on *Hydra*. As we had the pest in two tanks—one containing small fry two weeks old and the other, swordtails, zebras and wagtail platys, we followed the method given and put ammonium sulphate in both tanks.

All fishes appeared doped and stayed at one end of the tank all day. Next morning one zebra was dead in one tank and several small fry dead in the other. Since then we have lost another zebra and a total of twenty-four small fry out of forty. The fishes appeared doped from the time the ammonium sulphate was added until they were removed to clean tanks where the remaining fish were swimming freely.

W. WHEELER,
Walthamstow, E.17

The method is well-tried and safe to use if (1) *the chemical is dissolved in water before adding to the tank:* (2) *it is well stirred into the tank water as solution: and* (3) *if the recommended dose is not exceeded and pure chemical is used.*

Another Freak

ONE of my goldfishes is perfect but for the fact that it has two anal fins! There is one on each side of its body. Is this unusual and can anybody inform me why it should have this abnormality?

D. A. CONROY,
Newport, Salop.

It would be most interesting to know exactly why a particular abnormality develops but all that can be said is that goldfishes are particularly prone to produce freaks from their spawnings and that duplications and omissions of organs are both quite common.

READER'S RECORD:

Swordtail Breeding

DURING the last two or three years I have been making a study of some of the livebearers, mainly platys and swordtails, and the following is a record of some of my findings.

I have always been keen to obtain a really good strain of black swordtail and none being readily obtainable I decided to breed my own. The classical way of obtaining black swords is to cross a green sword male with a black platy female. On discussing this with a fellow aquarist we decided that albino swordtails would be better than green owing to their complete lack of body pigment. We were further influenced by the fact that I had been breeding albinos and had a good selection to hand.

Not knowing if the cross had been made before, I made searches into genetics articles to try and form theories of what we might obtain. Luck was with us, my friend making the first step—though in reverse—it being a male black platy × female albino sword. After the birth of the first young the female died, seemingly through the size of the young (of which there were fifteen), their heads appearing to be rather outsize. These young turned out to be mainly black with white patches, and with live foods, micro and brine shrimps plus adequate room for growth, were approximately an inch long at two months.

There turned out to be seven having mainly black bodies with all clear fins and a whitish line from the mouth along the back to the first dorsal ray. Five were black all over except for the paler belly and clear fins and the last three were black all over, the colour even spreading into the dorsal and caudal fins. These latter were rather smaller than the rest and it was evident that two of them were male black platys, but the third showed a faint sword appearing. All the rest remained female swords.

Shortly after we removed the two black platys all three males died within a week; also three of the females died, but four of the remaining females when they were three and a half months old gave birth to young—two broods having platy characteristics and two swords.

One of the crosses I was trying was with two adult fish, a black male swordtail loaned to me by Mr. Sinclair of the Paignton Zoo Aquarium (the only black he had) and a large albino female of my own. These fish were together for two and a half months until the death of the black male (killed by his mate). I waited for several weeks hoping the albino would show signs of a brood, but no luck—so I concluded the experiment had failed.

Being keen to get a female wagtail sword of either red or gold coloration I put the albino female with a red wagtail swordtail. Sure enough, in three weeks she deepened and looked due for a colossal brood; I expected at least a hundred wag-sword crosses. But once again I was disappointed. This time she did give birth just four weeks and two days after the male was put with her, but only eleven young appeared. These are uniform in colour, being yellow wagtail swordtails. As these fish are now only a few weeks old I hesitate to say they are yellow wagtail swords in view of what has happened. The albino female meanwhile still looked plump, and I thought she would drop her next brood early; this time I really promised myself a hundred or more, having found in the past that a second brood usually yields the highest number.

Then, only two weeks after the birth of the yellow wags the albino female was found dead one morning. I was disappointed, but took her out of the tank and decided to hold a post-mortem to see if the fatness was a growth or a large brood of yellow wags. I cut her open with a razor blade: it was neither. She had been carrying the results of the black sword mating all this time. There was a colossal brood of blacks and albinos, quite a hundred, evenly divided, all of which looked almost ready for birth, there being no egg-sac attached to their bellies as is normal in under-developed young livebearers.

I have found before that it is possible for a female already fertilised by one male to be re-fertilised by a second, which takes priority, during the few days around the time she is delivering the brood of the first male. But never before have I had a fish carrying a brood from one male, re-fertilised, and having a brood from the second male before she ever had or even looked like having a brood from the first male. Although there were a few eggs in the fish as well as the black and albino young, there was no trace of any more yellow wag-swords.

It seems that in a black × white cross, whether swords or platys are used, you risk the loss of the female, though this may be purely coincidental. I would appreciate receiving the views of anyone working on a similar cross.

R. B. Perrett

BOOK REVIEW

The Goldfish of China in the XVIII Century by George Hervey. 66 pages, line illustrations. China Society Sinological Series No. 3. Agents: Luzac & Co., 46, Great Russell Street, London, W.C.1. Price 10/6 net.

THE first European book to be written about the goldfish was the now rare *Histoire Naturelle des Dorades de la Chine*, published in 1780. Its author, Billardon de Sauvigny, had based his text on a French *Notice* (1772) on goldfish in China, sent from Pekin together with a Chinese scroll depicting ninety-two goldfish. Mr. Hervey, in his handsome monograph, has translated the *Notice* into English for the first time, and fishes from the scroll have been included in a folding plate.

With the translation, which is arranged throughout more than half the book on pages whose facing pages bear the original French text, are the author's historical notes and his criticisms and comments on the types and breeds of goldfishes mentioned.

The *Notice*, in translation, is a queer but edifying mixture of history, reports, original natural history observations, practical advice and philosophy. To a modern reader these notes on goldfish culture from the eighteenth century bring home, perhaps unexpectedly, the antiquity of the interest in many of the points concerning these fishes that still draw attention as if they were fresh.

Some of the Chinese ideas were odd, of course. And some parts of the translation make us realise in what different surroundings and times we keep our fishes: *a propos* feeding goldfishes " . . . give them to eat only the little red worms that one finds in the mud of lakes and stagnant waters; . . . . There are several subordinate eunuchs at the palace whose duty it is to find every day a certain quantity of them."

Mr. Hervey has done more than present a mere scholarly translation, however. The joy that he obviously experiences in uncovering historical facts, in literary researching, is captured in his book, and the reader is able to glimpse the detective at work and to share this enthusiasm when perusing the author's notes and comments. This book cannot fail to interest an aquarist whose interest is the goldfish; it will delight the naturalist antiquarian as well.

A. E.