

# The AQUARIST

## AND PONDKEEPER

Founded in 1924 as "The Amateur Aquarist"



THE BUTTS, HALF ACRE, BRENTFORD,  
MIDDLESEX

VOL. XIX No. 5

1954

Telephone: HOUnslow 9301

PUBLISHED MONTHLY

SUBSCRIPTION RATES

The Aquarist will be sent post free for one year to any address for 19/6. Half-yearly 9/9. Canada and U.S.A. \$3.00 yearly; \$1.75 half-yearly.

### QUERIES

Postal replies are made to all specialised queries accompanied by a stamped, addressed envelope. This privilege is afforded only to registered readers and direct subscribers. Subscription forms can be obtained on application. In all cases letters should be addressed to the Editor.

Correspondence with intending contributors is welcomed.

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

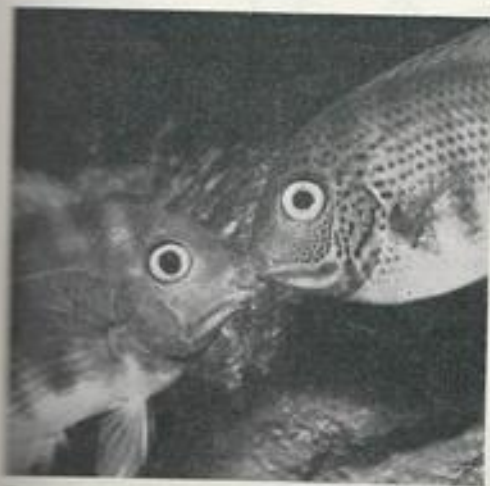
The Editor accepts no responsibility for views expressed by contributors.

## Editorial

HAVE you ever felt curious about the people who collect the tropical fishes you keep, or do you merely accept the fact that the fish are delivered to your local dealer from some unknown source, and leave it at that? Sending tropical fish to Europe and America has become a thriving export trade of several small countries, but the importance attached to this and the extent to which it can touch the livelihood of people in the areas concerned is not often appreciated here. It was specially brought home to us by seeing an article in the *British Guiana Chronicle* portentously head-lined "British Guiana Aquarium Fish Export Trade is Doomed" (although more hopefully qualified by the line "Unless There is Government Control").

In British Guiana there are apparently many men employed in fish collection by sizeable firms which act as exporters to Europe and America. In 1952 their trade profited the Colony to the extent of 369,000 dollars, but last year earnings dropped to 51,000 dollars. This, the big fish exporters say, is because small local dealers who have "mushroomed" into the business are taking the quick-profit course of sending fish only as far as Trinidad, where dealers are alleged to be exploiting the situation by exporting the fish to America and so gaining the dollars themselves. Trinidad competition is said to be making trade uneconomical for the British Guiana exporters because, whilst their Government imposes both duty and export tax on the fish, Trinidad dealers pay neither.

The implications for the Colony of failure of the big exporters are wider than the loss of dollars. Unemployment, it is said, will follow, not only in the ranks of the fish collectors, but for tinsmiths as well, for in the good year of 1952 the exporters encouraged local tinsmith trade with hundreds of dollars for fish cans. An appeal has been made to the Development Secretary of the B.G. Government to introduce legislation that will prevent Trinidad exploitation. Aquarists, it appears, have started



Laurence E. Perkins

"Who switched that light on?" This seems to be the startled reaction of this pair of *Cichlasoma severum*.

# Aquarist on Holiday

by ROY WHITEHEAD

IT is more than likely that some readers are already on holiday but for most of us the annual break has still to come. Have you thought of continuing your hobby when you are away from home? A scrutiny of the news columns of *The Aquarist* may reveal a special invitation to visitors from a club in the district of your choice. Why not take advantage of one of these offers? Although the date of your stay may preclude your attendance at a meeting, you will almost certainly be asked to inspect some of the members' set-ups and this may add materially to your knowledge of the hobby. For the benefit of beginners, it is the writer's experience that as a body aquarists are as friendly and hospitable crowd as you'll ever care to meet.

Some aquarists, in common with millions of other holiday-makers, especially those with children still in the bucket and spade stage, will be having an orthodox seaside holiday and for these there is a marvellous opportunity to add to their experience of the strange creatures of beach and rockpool. Perhaps you are taking a car with you and may be able to find room for a few specimen jars and containers for seawater. A perusal of back numbers of *The Aquarist* containing notes and articles on marine life will give a guide to those fishes and animals that will live happily in

a small aquarium, and also suitable methods of collecting and keeping them in good condition.

Two books on the subject of marine fauna and flora are of particular interest to the aquarist on holiday by the sea. One is *A Seashore Calendar* written by Mr. L. R. Brightwell who is a frequent contributor to this magazine on marine subjects. His book is divided into twelve chapters, one for each month of the year, and thus, although the book is immensely informative as a whole, you will find the chapters for June, July, August and September of most interest. The other book is *A Naturalist's Holiday by the Sea* by Mr. Arthur De Carle Sowerby. This book deals with the shore life of the Cornish coast but most of the fishes, birds and crustaceans described are common on other coasts of the British Isles. Both books are well illustrated with line drawings and photographs which will aid identification of any finds. The last named book briefly covers conchology in the last chapter which has the title "Some Sea Shells," and is sure to be useful to those who plan to collect shells whilst on holiday.

## Books on Holiday

Some difficulty may be experienced in obtaining either of these books at your local bookshop as they first appeared in 1935 and 1923 respectively; it is almost certain, however, that a copy will be available at your Public Library. Incidentally, if you wish to continue your reading whilst you are away, it is worth remembering that nearly all Public Libraries will issue a temporary reader's ticket in exchange for the one you normally use at home.

*A Seashore Calendar* by L. R. Brightwell, published by Thomas Nelson & Sons, Ltd.

*A Naturalist's Holiday by the Sea* by Arthur De Carle Sowerby, published by George Routledge & Sons, Ltd.

## FRIENDS & FOES No. 27

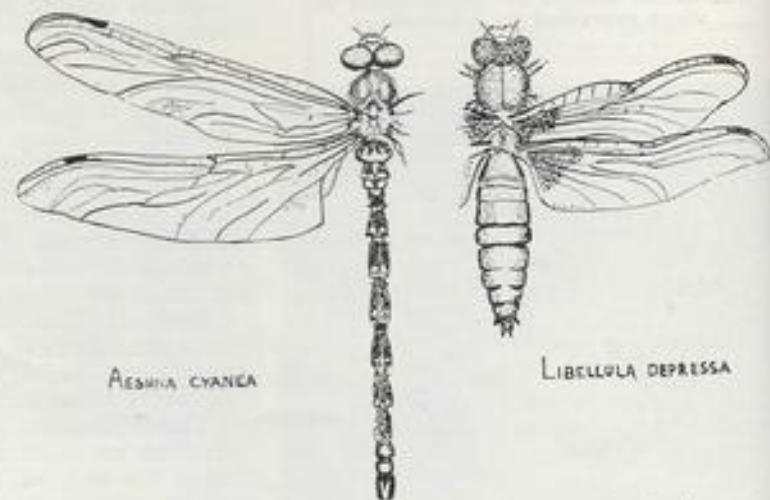
### ODONATA

PHYLUM:—Arthropoda, from Greek *arthron*—joint, and *podos*—foot.

CLASS:—Hexapoda, from Greek *hex*—six, and *podos*—foot.

THE dragonfly ranks high as an enemy of the common gnat (discussed last month) and, in fact, is often called the mosquito hawk. Thus, it is a friend of the man in the street—the non-hobbyist, but not of the aquarist, depriving the latter of a valuable potential source of live food for his fishes. Nor is this all. In the larval and nymphal stages, the dragonfly seeks to consume fishes themselves, and so becomes a doubly-dyed villain.

The egg-laying method of the female dragonflies differs according to the species. Some scatter single eggs indiscriminately over the surface of the water—eggs which are much smaller than pinheads, but usually elliptical. Some species are held by the male fly's claspers while egg-laying is in progress, the pair rising and dipping on the water surface together. Others are unescorted. Still others concentrate on one or two spots at the edge of the pool, usually



AESHNA CYANEA

LIBELLULA DEPRESSA

where there are weeds, and release a batch of eggs every time they dip their abdomens beneath the water surface. These eggs are contained in a mucilaginous envelope, which swells up, and sticks to the weeds. It is common to find hundreds of eggs in one sticky mass in these transparent cases.

In the same way that the imago can be classified as long bodied and short bodied, so the larvae which hatch from the eggs are long and smooth, or short, broad, and hairy.

C. E. C. Cole

THE AQUARIST

# Delayed Hatchings of *Pristella riddlei*

by L. WARBURTON

FOR some considerable time, the writer has been engaged in the breeding of some of the smaller characins, notably enamel-fins, flame fish and black widows. As is usual, the system adopted has been to reserve certain breeding tanks for their respective species, and this has been done for two reasons.

Firstly, it is known that most species of fish, when segregated, will adjust the pH to their own optimum value, and care in cleaning the tanks, coupled with precautions against loss by evaporation, ensures the minimum variation in pH of the water. Secondly, and perhaps not quite so well known, is the fact that many small characins "marry." In other words, a pair which have mated once will often show a definite affinity to each other on future occasions, to the exclusion of other available mates. This "marriage" is materially assisted by always mating the particular pair, and, if it can be arranged for the same tank always to be used, with the same kind and disposition of vegetation, spawning is invariably earlier, and more complete.

So much, then, for the methods which have been employed in the past. The subject of this article was first brought to light by an enforced departure from the normal routine, inasmuch as a pair of cherry barbs was introduced for spawning into a "*Pristella riddlei* tank." This was because the female cherry was getting too heavy, and their own tank was under repair. The cherries duly spawned, quite heavily, and after 10 days, or so, a rough estimate gave the figure of 60 fry likely to survive. This was somewhat lower than average, as up to a 110 fry had previously been raised from the same pair. However, this was ascribed to the wrong tank having been used, and there the matter rested.

## First Three Enamel Fins

When the brood was a few weeks old, and transference was taking place, three *Pristella* were found, all of the same size as the cherries, and doing quite well. As the previous brood of *Pristella* had been removed rather young, and as these fish are notable for the fact that development in any brood is most irregular, it was assumed that three very tiny fry had been inadvertently left in, had somehow escaped the suction tube, during cleaning, and had developed along with the cherry barb fry. Consequently, no more thought was given to the matter.

At five weeks old, the final batch of cherries, along with the three *Pristella*, was removed from the tank. The tank was then emptied to within two inches of the bottom, the gravel thoroughly stirred, another inch of water siphoned off to remove debris, and the tank re-filled and re-planted. After settling for two days, final siphoning was carried out, Infusoria added (this is always done before spawning) and another pair of cherries put down.

Spawning was delayed by a matter of 36 hours—quite usual when cherries are placed in fresh water—but the eventual spawn was quite heavy. Total number of fry raised on this occasion was about 90. When these were a fortnight old, and just showing colour, four *Pristella* were discovered amongst them. Three were of approximately the same size as the cherries. The fourth was almost twice as big, and was attacking and devouring the smallest of the



Photo

Laurence E. Perkins

Enamel fin (*Pristella riddlei*)

cherry fry. After taking the precaution of removing all the four *Pristella*, it was decided that a properly controlled experiment would be worth undertaking, in order to obtain some confirmation of this somewhat astonishing business.

The following procedure was therefore adopted; it appears to be foolproof, and it is emphasised that a most diligent search was made on all occasions when the tanks were supposedly empty, to make quite sure that no hatched fry were present. Two heavy female *Pristella* were placed in separate tanks. As only one reliable male was available at the time, he was first placed with the "strange" female, whom he spawned-out in about 16 hours. After a day's rest, plenty of worms and *Daphnia*, and a day's fasting, he was placed with his "wife," in the other tank and they spawned immediately. The parents were removed and hatching was awaited. This began as usual, after 18 hours, and after about 36 hours, in each case, a good batch of fry was hatched out in each tank.

Feeding was commenced in due course, and micro worms were taken by the largest fry, at 11 days. As there were plenty of tanks available, the fry were transferred at the earliest moment, according to size, so that the smallest were eventually left in the breeding tanks. As soon as they could be handled they were all put in the one tank, and the other tank left strictly alone. By now, it was 21 and 23 days, respectively, since the spawnings. After a further week, the empty tank was thoroughly searched, and no fry were seen. The other tank was then emptied of fry, the greatest care being taken to ensure that no stragglers remained, and, thereafter, both tanks were scrutinised daily for five days. No fry were seen.

Next, a pair of *Barbus oligolepis* was introduced into the tank which had been empty longest, and spawning took place. Incidentally, this was a poor spawning, as the female died egg-bound after dropping about a dozen or so

eggs. These were all fertile, however, and hatched within the next day. Development was normal, and the black spots on tail and gill-covers appeared at eight days. At 12 days, one *Pristella* was seen, of the same size as the checkers, and with the black smudges on dorsal and anal fins. A careful watch was kept, but no further *Pristella* were seen, and the tank was again cleared after three and a half weeks from the spawning of the barbs. This, it will be noted, was almost nine weeks from the *Pristella* spawning.

Immediately both tanks were stirred, siphoned down half-way, topped up, and a pair of cherries placed in each. The first pair spawned at once, they being in the tank in which the last of the *Pristella* had been kept. The other pair did not spawn for four days, and were very busy in the gravel for most of the time, apparently finding something to their taste. They were well fed on white worm, but often rejected it in favour of whatever they were getting out of the gravel. This is the only time the writer has ever seen cherries really "grubbing" in the compost. As soon as they spawned they were removed.

Turning now to the other tank, the brood of cherries was coming on, and quite free-swimming. They had the usual food, and progressed very well for a fortnight. At the end of this time they had coloured, and a careful inspection revealed about six or so fry with no colour at all. After a good deal of "hard labour," five of these were caught in a dip-tube, and transferred to a small tank. Sure enough, after another week, they were obviously *Pristella*. Two other fry in this tank eventually turned out to be the same, and a further two showed *Pristella* markings, a week later, in the other tank.

At the time of writing, there is a *Pristella* in a further brood of cherries, hatched four weeks ago, which was 12 weeks after the original *Pristella* spawning. At no time, since the original spawning, have any mature *Pristella* been in either of the tanks, and, of course, it need hardly be said that none of the *Pristella* brood are even approaching sex maturity yet. It follows, therefore, that all hatchlings of enamel-fins must have been from the one spawning.

Some interesting conclusions may be drawn from the above experiment. Firstly, the fertilised eggs of *P. riddlei* are apparently capable of remaining viable for very long periods. (At least 12 weeks.) Secondly, it would appear,

although confirmation seems to be called for, that those eggs which do not hatch within the normal period of say three days, have some special properties. It is apparent, from the foregoing, that viable eggs have been present in both the tanks, after the hatched and partially grown fry have been removed. The important point would seem to be that, although ample time was allowed for these "delayed" eggs to hatch in the cleared tanks, in no case did any such hatchlings occur until after a further spawning, of a completely different species, in fact, a different genus, of fish. (Regarding this point, it is known that female fish, when about to spawn, exude a hormone-like substance, which excites the male. This substance may have some stimulating effect on dormant eggs. The writer considers this much more likely than the theory that the uncoupled male gametes or spermatozoa could have any effect upon an egg of a different genus.)

Thirdly, as regards ultimate development of these "delayed" fry, it is, as yet, too early to make any definite pronouncement, but they are all apparently developing normally, but rather slowly. The best fish of the spawn, out of the original (normal) hatching, are now about two-thirds full size. The latest of the "delayed" fry is only one quarter-inch in length. With the Editor's permission, it is proposed to publish details of final development in due course.

For those readers who are technically-minded, the following details may be of interest.

Size of tanks: 18 ins. by 12 ins. by 12 ins. Water, 8 ins. deep.

pH ranged from 6.9 to 7.2 (electrically measured) this range being obtained naturally, without any adjustments.

Temperature: 77° F. plus or minus one degree (specially controlled). This temperature was maintained throughout the whole of the experiment, until the present time.

Breeding stimulants: synthetic human-type male hormone, 0.5 mg. per gallon. Ditto, female type, 0.1 mg. per gallon. Infusyl tablet 24 hours before introducing pair. Parent fish fed white worm until spawning complete. Surplus worms removed with parents.

Vegetation: *Cabomba* only.

The writer would be most grateful to have details of any similar experiences, either with *Pristella* or other fish.



## Cacti in the Fish House

**T**HERE are a few pests which may attack cacti and some advice on their recognition and methods of destruction may be helpful. The usual green fly do not appear to worry cacti very much but a most troublesome pest is the mealy-bug. This is a small, slow-moving creature, grey in colour, which has a covering of "meal" on it. This powder-like substance is impervious to water and so the usual insecticides have little effect as they do not penetrate. The pest sucks the juices of the plant and lays its eggs in a form of fluffy nest. If any of these pests are seen between the

tubercles of a plant they must be dealt with immediately as otherwise they can spread to other plants and become difficult to clear.

In any small collection it is quite easy to kill these pests as they can be picked out with a pointed match stick. The best insecticide for their destruction is a mixture of one part of nicotine to 40 parts methylated spirit. The spirit will penetrate the meal but is not of itself sufficient to kill; the small amount of nicotine however will soon do the trick. Do not overdo the amount of nicotine as it can stain white hairs or spines on some specimens. Where only a few pests have to be dealt with a pointed stick can be dipped into the solution and the bug or nest can be touched, when the pests will be killed. If a bad infestation has taken place it may be necessary to spray the plant. This should on no account be done in the fish-house as the nicotine can be very dangerous to the fish. If a plant must be sprayed take it out of the fish-house and do not return it until it has had a clean water spraying and all traces of nicotine have been removed.

Many types of small spray are on the market but it is found that in a short time they become clogged or some working part fails. The best type is an artist's fixative spray, which is just two small tubes hinged together. One goes through a cork into a bottle and the other meets it at an angle. By simply blowing through this tube a fine spray can be directed wherever needed and there are no washers or valves to get out of order.

# JOURNAL of a Marine Aquarist

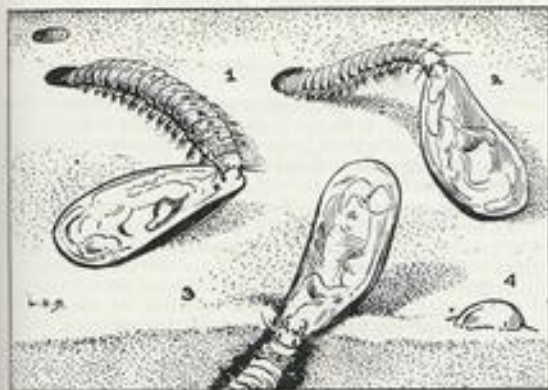
by L. R. BRIGHTWELL

A POPULAR parrot cry in these days of cheap publicity and ten-a-penny nine-day wonders is "Success Story!" Of course, the most really fascinating feature of any such story is not the long delayed climbing to the shining heights, but the series of flops and crashes which marked the successful one's painful way up the tottering ladder. For this reason I have never minimised the endless difficulties which beset the path of the marine aquarist and so, luckily perhaps, this most valuable branch of aquarium-keeping—touching as it does our food supplies—attracts none but the genuine enthusiast.

A major problem of the marine tank is keeping a floor of sand or shingle clear of that black bacteria which abounds in every pond, and some areas of the ocean bed, and in the end spells death to all around it. In a perfectly controlled aquarium, such as that at Plymouth, tank floors, involving a ton or so of sand or shingle per tank, are renewed several times a year—hard work and smelly, but vital to success. There is a fortune for the genius who can devise some system of drainage. Filtration, in sea water at least, is only a nuisance—it destroys so much plankton.

## Mussels as Filters

For some months I have been keeping an all-glass tank, 10 ins. by 6 ins. by 8 ins., with a two-inch floor of sand and four inches of water. The occupants were two carpet clams (*Telpe*), two basket whelks (*Nassa*) and one half-sized common whelk. To a large extent these creatures served as natural ploughs; but the bottom of the sand—always the storm centre—began to discolour. So in went four large "king rag" (a variety of *Nereis diversicolor*?) and at once healthier conditions returned. The worms are beautiful rainbow-coloured beasts some six inches long. Incidentally, I keep mussels in every tank, partly as a handy food supply, and to serve as natural filters. (In the great days of Brighton



The ragworm deals with a half mussel exactly as an earthworm deals with a dead leaf.



Common and basket whelks attacking the eggs of a sand snail.

Aquarium, prime oysters were used, at fourpence a dozen.)

Each worm made a tell-tale blowhole, and at night, after three weeks' residence, began to surface for a swim. But investigation showed the fatal blackness to be started. I changed the sand (that was five weeks ago) and there has been no further trouble. Query, has this solved the age-old problem of keeping bait fresh? One diffuser is kept running about 14 hours in the 24.

Much encouraged, I tried out four "red rag" in an 18-inch square tank with six inches of water and about an inch of sand. These polychaete worms are often extremely difficult to identify, and whether the so-called red rag are a distinct species, or a variety of the common, or the king rag, is a matter than can only be judged authoritatively by the expert . . . or the grossly ignorant. To be brief, these worms, after a half-hearted attempt at burrowing, died. They died in a few days, and nastily, behind rocks and inside shells, seldom in the open; so the trouble was not suspected until the water clouded, and my favourite pets, the hermits, began to join the rag worms in Nirvana. There was no resource but to strip the tank, a smelly business, but no great tragedy with the sea only 47 yards distant. Some creatures, such as a big blenny of two years' residence, and divers winkles and rock whelks of the same period, escaped disaster by crawling above waterline.

## Nurse Eggs

To-day the tank is once more all that could be desired, but only another marine enthusiast knows what lies behind it. This time of year (March) is one of the most exciting in the maritime calendar. All kinds of creatures are coming inshore to deposit eggs. In the king rag tank, the basket whelks are ploughing through the sand with only their siphons showing and the question arises, will they lay their strings of flask-like eggs?—graceful objects of a glassy texture and very different from the big, shapeless egg capsule masses of the common whelk. Each of these purse-like, semi-transparent, parchment-textured capsules contains two or three-score eggs, but only a dozen at most come to fruition. The others are known as "nurse eggs" and serve to feed the more vigorous few. The emergent whelk babies carry little globular shells, more suggestive of *Helix* than *Buccinum*. It has been reported, on good authority, that the infant hermit-crab, once clear of its final larval shell, makes its debut as a portable householder in

(Continued overpage)

## In the Water Garden in AUGUST by Astilbes

THE lush growth of many of the water plants will need extra care to avoid overcrowding, especially in fairly small ponds. It is rather unusual to complain of the lack of growth of water plants—the opposite is the general case. This means that one should always be on the watch to see that a particularly rampant kind is not over-shadowing a more delicate one. Some kinds are so strong that if not checked can soon cover too large an area at the expense of a more attractive but smaller-growing type.

One of the strong-growing plants for the pond side is *Alisma plantago*, also known as the great water plantain and mad dog weed. For a good-sized pond this species will thrive well but it does not appear to be too happy when planted in deep water. A shallow position near the side of the pond is much better for this subject. The leaves are strong and well ribbed, somewhat similar to the ordinary plantain of the roadside. The panicles of flowers are rather delicate looking for such a coarse plant, with tiny pinkish or rosy-lilac flowers on a stiff stem.

There are several different species of *Alisma*; one, a Japanese species, grows to 12 inches in height and this has white flowers. Its name is *Alisma rariflorum*. Another species, *A. lanceolatum*, grows to about 18 inches in height and, as the name implies, the leaves are more slender than the type plant. *A. gramineum* will grow under water quite well so can be placed in a deeper position than the former plants. In this plant it will be found that most of the leaves which grow under water will be almost strap-like, whilst those above the water will be shorter and broader. This plant has pinkish-white flowers.

When using the more vigorous growers among the *Alisma* one must be careful to remove most of the seed heads when they have nearly ripened the seeds. If this is not done the seeds may spread about the pond and cause overcrowding, especially where there is a natural bottom to the pond. All can be increased by seed or by division.

Keep a close watch over the water lilies and remove all the dead flowers as soon as they have finished. In small ponds the decaying flowers can cause a certain amount of pollution and so are best removed. This also applies to the lily leaves, which must not be allowed to cause trouble when they die back. It will be seen that as they decay an amount

of oily substance will float to the surface of the water and look unsightly.

The question of manuring or fertilising water plants should not arise during the growing season. Any form of manure is only necessary when first planting or setting up a pond. If the pond contains fish, as it should do, these will supply all the fertilisers required. It is more often necessary to restrict the growth of some of the water plants to prevent them from taking up too much room. It will be found that if plants are kept restricted, not only will the leaf spread be checked but also the flowers will be much smaller. The size of an actual flower seen in a pond may be little indication of its possible size. I have known water lily blooms no more than two inches across when in a restricted position, yet the same lily could have produced flowers more than twice as large if given good conditions.

In concrete-based ponds where lilies have been potted into small pots it will be noticed that the plants can be kept within reasonable bounds but that the flowers will be much smaller than usual. It will be seen then that, although there are many types of lily which produce flowers of differing sizes, much also depends on the conditions under which they grow as to the actual sizes of the flowers produced.

### Maurice Denham—Importer

READERS may have noticed a paragraph in the film notes of a popular Sunday newspaper a short time ago which mentioned that Maurice Denham, the well-known film and radio personality, carried a number of fishes with him on his return by air from a film location in Ceylon. A few inquiries have proved the report to be substantially correct. Mr. Denham, however, is not interested to any great extent in the hobby and in this instance was acting as an "importer" on behalf of an aquarist friend, Mr. Norman L. Gryspcedt. The imports were two moors, a calico veiltail and a young oranda; Mr. Gryspcedt is hoping to breed from the veils and the moors shortly. Apparently the general standard of cultivated fishes available in Ceylon is not high and some considerable difficulty was experienced in obtaining specimens of the desired high standard.

R. W.

### Journal of a Marine Aquarist

(Continued from preceding page)

these tiny whelk shells, actually raiding egg capsules in search of the ideal home.

The hermit cannot be exaggerated as a source of entertainment in a tank. It needs good aeration and enough, but not a surfeit, of softish food for it is largely a plankton feeder. Much time is spent sifting sand through its hair-fringed claws. Always active, at night it becomes feverish, feeding, fighting and home-hunting with fierce energy.

To feed whelks of any kind, I split a raw mussel and place one half of the shell, with meat intact, meat upwards in the tank. Then you can see at once if the sea-snails have had it, or merely dallied or dug it under the sand, there to decay.

The weird egg masses of the necklace or sand-collar snails (*Natica*) are now in evidence, and the common whelk devours these, gnawing great holes in the structures. And, for the benefit of fellow marine aquarists, it may be mentioned that March is the month when the acorn barnacle releases its abundant young—a transient but still welcome source of nourishment for those most difficult of all aquarium pets, the various plankton feeders.



Photo:

Laurence E. Perkins

Great water plantain (*Alisma plantago*)

# AQUARIST'S Notebook



by  
RAYMOND YATES

ALTHOUGH aquarium plants are on sale throughout the year they are undoubtedly cheapest in summer and stocks should be bought then with an eye to having reserves through the cold winter months. So many plants are available that the aquarist is spoilt for choice. He looks at the wonderful tanks exhibited as furnished aquaria at various shows and sees some of the finest examples of underwater plant life on view. What he often fails to realise is that these tanks are set up for a few days; the entire effect is artificial and no tank could look like they do for very long. Almost all show furnished aquaria are shockingly overplanted and in spite of this point being emphasised time and again they continue to be overplanted.

Roughly speaking aquarium plants fall under two major headings, those which grow very quickly and those which do not. In the main the slow-growing plants are the most expensive but last the longest. A tank which is set up with quick-growing plants becomes overcrowded in no time and the aquarist is forever cutting back, trimming and replanting until he gets thoroughly sick of the speed at which his plants grow. Quick-growing plants usually demand good light; given this their growth is amazing. Examples of these fast growers are *Elodea* (or any of its other names you care to give it), *Myriophyllum*, (parrot feather), *Cabomba*, *Hygrophila*, hornwort and water cress. Floating fast growers are duck weed (*Lemna*) and *Salvinia*. *Vallisneria* and *Sagittaria* are moderate growers and rank with pigmy chain sword plants as a half-way house between the fast and the slow.

Of these latter the most popular is *Cryptocoryne* which can be obtained in all sorts of varieties and sizes. It does not like too much light and is always a slow grower. On the other hand once it has taken hold it will last for years. The leaves last a very long time but occasionally get a coating of green or blue-green algae. They are often left thus in public aquaria but personally I think this spoils the effect. Each algae-covered leaf should be removed and it will be found the plant quickly sends up another shoot. The more *Cryptocoryne* leaves are removed the faster young shoots are thrown up, but the new leaves never reach the size of the original. *Cryptocoryne* plants look best when massed together in a tank covering at least one square foot of space and are ideal for the back and sides, which normally get the least light. Plants should never be kept out of water: if they are not lost entirely they are considerably retarded thereby.

Club finances being what they are it is not always feasible to have a speaker for every meeting, nor, for that matter, is it desirable. In the summer, visits to local ponds, *Daphnia* hunts, biological outings and trips to well-known breeding establishments have an appeal of their own. In the winter the members can, and should, be able to provide many programmes. "Twenty Questions" on aquarist topics is great fun if you choose a good team, as also is a "Brains Trust." Debates also offer a great deal of scope in a good club. Demonstrations of glazing or glass cutting or setting up tanks are always instructive. A table show where everybody in turn has to judge all the entries is most revealing as almost all the members will have produced different results. The more fish available for judging in this case the better. An inter-club table show and "natter" is good fun as also a table show for "breeders." To start them talking you can have a night devoted to "Troubles," where members can tell of what went wrong. Talks on "How NOT to breed so and so's" go down very well. Another popular item is "One Minute Please"—talks on subjects

drawn out of a hat. One night might be given over to inviting the local angling club representatives to drop in and give a different angle to fishy problems. Other ideas are a quiz, films, bring and buy sale, auction, social evening and inter-club visits. No club night need be dull if your committee has imagination.

Biologists use urethane commonly as an anaesthetic, although it does not seem to have been used by aquarists in this country to any extent. The white crystals resemble sea salt and an ounce costs approximately two shillings, although it has to be ordered as a rule. Put about as much as will stand on a shilling in a pint of water and put the fish to be treated into this solution. Within three minutes the fish is completely under the action of the anaesthetic and lies on the bottom, with rapid breathing and vigorous movement of the pectoral fins. As the eyes cannot close it is hard to realise at first that the fish is "asleep." It is now possible to handle the fish for treatment or surgery as may be required. On return to fresh tank water the fish appears to "come round" instantly although it may rest on the bottom for long periods. No injurious effects are noticed by the use of urethane and it is certainly useful in those cases where a fish has to be handled with the minimum of difficulty.

Many aquarists make the mistake of only looking at their fish through the glass sides of their tanks, and it is these people who wake up one morning to discover that one or more of their fish are becoming emaciated and showing signs of that wasting disease for which, as yet, no cure is known. The wise aquarist will regularly make a point of looking down on his fish from the surface, because this view gives him a very much better idea of the health of his finny friends. Many a fish seen from the side looks quite passable, but viewed from above many defects become obvious. It is a point worth remembering.

When tanks for a show are borrowed or hired they are all too rarely thoroughly washed out, mainly because of the fact that the club members are working against time and have quite enough to do in any case. Quite apart from the important standpoint of hygiene there is another aspect. Unless the tank is flushed out thoroughly any dust and the like remains, and when the tank is filled with water for the show this dust forms a nasty film on the surface. In many cases this is not very obvious but sometimes it can be most unsightly and may be dangerous where fish like the anabantids are concerned. Some time ago I noticed a fairly rare fish (Malayan airship fish) in just such conditions and perhaps it was fortunate that this gourami is not so keen on surface air intake as some of his relatives.

Show secretaries should bear in mind, when making up their show programmes, to include the names of the actual fish on view in those sections described as "Any Other Variety." These are often popular classes and the beginner to the hobby or the complete stranger thereto is quite lost as to what each individual fish is called. Names might not mean much to these people but they should still be given

... nothing is more annoying than to come across some exhibit at any show which attracts attention but for which the programme gives no details beyond the name of the owner.

From time to time the rubber suction discs of tank thermometers come unstuck but the thermometer remains upright with the bottom of the tube (the mercury bulb) buried in the grit. Where this happens the thermometer will give a lower reading than the actual temperature of the tank water, often as much as five degrees.

When aeration is used in a tank it will be found that there is a tendency for the dirt and detritus to be found mainly in the vicinity of the aerator stone. Exactly the same thing happens where a tank is not illuminated in a uniform manner, the dirt tending to collect at the dark end of the tank, providing, of course, that fish are present. One of the troubles with the large piston-type pumps is that they cannot be reduced in output by the use of clamps and the like as is done with the diaphragm types. The reason for this is that if the air pipe is narrowed by the use of a clamp the pump will work slower and even come to a full stop. This working at full output is no inconvenience where the pump is aerating several tanks but if it is used for only one tank then the diffuser will be working at full pressure and this will not only be too fast for the fish, but all the mulm will be disturbed and a very dirty tank will ensue. To overcome this difficulty it is necessary to have a two-way connection from the pump, one going into the aquarium and the second being lead into a diffusing stone in a separate glass jar. It is now possible to clamp the aquarium pipeline as needed, and the excess air output will run to waste in the glass jar. There is a certain amount of noise from this jar and this can be cut out by putting this also in the aquarium, taking care to see that the rim of the jar comes above the surface of the aquarium water. Many cloudy tanks are due to nothing more or less than too energetic pumps or insufficient diffusing.

It should not be supposed that meat or fish which has been left over in the house, or overlooked, and is now rather too "high" for human consumption, will be disdained by the fish. On the contrary, fish (like many reptiles) are not so choosy and will eagerly devour various meaty foods intended for our own table which, by our standards, are decomposing and in process of going bad. Cichlids have quite a taste for "high" foods and they will also eat any pieces of food left in their tank uneaten up to three or four days later. Naturally excess food should not be given or left in a tank, but like sailors, cichlids "don't care" and will unblushingly eat food they ignored several days earlier.

I have recently had an opportunity of looking through the various issues of about a dozen different club magazines from different parts of the country. All are good and one or two are really exceptional. Some run to about thirty pages, others a mere four, but all are an example of what can be done by keen aquarists. The same theme runs through every single one of them—a plea from the Editor for more "copy" to be sent to him or else—sometimes the appeal is nicely phrased, occasionally put very bluntly. The hobbyists who edit and assist with these club magazines do a great job; many of them have an exchange service with other societies and even with societies in other countries. Some magazines have a fine printed cover and almost all carry trade advertisements with an occasional private aquarist's advertisement. Only one was printed throughout, the rest were run off on a duplicator. Some contain cartoons, crosswords, jokes and articles by nationally known aquarists. Others are quite bucolic. All contain news.



Photo:

—The West Australian

This large pond in the grounds of the University of West Australia was being cleaned for a special occasion—the visit by Her Majesty the Queen this year.

One item which surprised me was where a society had chartered a special train for six hundred people to visit Chester Zoo—this from a Midlands club.

A few clubs do not issue a magazine but produce a news sheet only, which is a move in the right direction. Even so the clubs which produce anything at all in this direction are very few compared with the four hundred-odd clubs in the country at large and there is plenty of scope for budding editors who feel like starting something in their own society. One club has offered to produce a magazine monthly for any society which is interested, provided they pay for the paper, postage, time and ink. In addition they would have to type out the "copy" on stencils and post to the editor concerned. If any club is interested they can get further details by writing to Mr. J. E. W. Sharp, 70, Queen Street, Kettering, Northants.

Some fish just do not look their best in artificial light; to mention but a few—golden orfe, bitterling and *Apistogramma ramirezi*. Golden orfe look drab and lose all that lemon tint which is so fascinating in daylight. The other fish named both suffer because their blue and violet tints just don't show. On the other hand very plain fish sometimes look better in electric light or in subdued light. Such a one is the silver tetra. Give the light a bluish tint and the fish is magnificent.

Many aquarists do not realise that the curators of public aquaria in their vicinity may be interested in some of their stocks. The majority of these establishments have to watch their expenses very closely and are restricted to the expenditure of a certain amount each year on the purchase of new specimens. This is where the more experienced aquarist has an opportunity, as many of these establishments are only too pleased to exchange fish or to look after fish for a period. This does not apply, naturally, to the common varieties but to the more unusual fish and to the larger specimens. In addition most public aquaria breed stocks of tropicals "behind the scenes" partly for use in their own tanks and partly for sale to dealers with whom they frequently have working arrangements. The more advanced members of the hobby have nothing to lose by introducing themselves to the curator of any public aquaria within their home area; these gentlemen are usually a mine of information, can give many useful tips and may be able to work with the visiting aquarist, to the mutual benefit of both.





*A page for  
the beginner  
contributed  
by*

A. BOARDER

I HAVE been rather surprised lately to find that many aquarists have difficulty in getting their plants well established in newly set-up tanks, or else have trouble when trying to introduce a fresh specimen into a well-established set-up. From the many queries I receive it is apparent to me that many aquarists do not give sufficient thought to the needs of their plants when setting up a tank. Without doubt a number of healthy growing plants can do much to keep the whole set-up in a healthy condition, and so I make no excuse for dealing with this plant subject in detail.

Actually it should not be difficult to grow the usual types of water plants used by aquarists, as they have always plenty of water, a point which is not always as easy to obtain for plants in the garden! What else then must they have for them to thrive well? In the first place the roots will not keep healthy unless the compost used in the bottom of the tank is suitable. There are many methods of planting in a tank; some use a small quantity of garden soil and then cover with sand, some use fine sand and others coarse. Success has been attained with all methods. I have occasionally tried a little John Innes potting soil under sharp sand and have found good results, but I have also had good results when using coarse sand alone.

I think that a very coarse sand allows the roots to get established more easily but I have seen very well grown plants where very fine sand has been used. The user's reasons for using the fine sand is that by doing so the fish are able to pick up even the smallest pieces of food instead of this being lost among the gravel. I think the beginner would be well advised to refrain from using garden soil as this may give off something harmful to the fishes, and sometimes this is the cause of water clouding up some time after the tank has been set up.

It must be remembered that the water plants can serve a very useful purpose in using up some of the decaying uncaten food and also the droppings from the fish. The more nourishing the soil in the tank the less will be the need for the plant roots to search for the waste matter in the tank. Therefore they will not be encouraged to perform one of their main purposes. Sufficient compost must be placed in the tank in the first place, and then later on, if any sand is drawn up and lost when servicing the tank some should be added occasionally so that there is never a bare place at the base. The compost should reach the top of the lower front of the frame and be at least three inches deep at the back and ends. A good amount of compost will mean that the plants can get well established and they are then not so likely to be uprooted by food-seeking fishes.

Once the plants are growing well and the mulm is lying fairly thickly about the base of the tank it will be found that there is no difficulty in keeping the plants healthy. The weekly servicing can remove the mulm at the front half of the tank but some must always be left at the back. Where you have a few well-placed rocks it is possible for a good layer of mulm to remain behind these whilst the front part, which is on view, can be kept clear.

I am sure most aquarists who fail to get their plants going do not realise that most of the plants bought will have no roots. They must be encouraged to make these before they can be expected to grow well and do their job. Instead of pushing these unrooted cuttings into the compost it is better to get them to make fresh roots first. If they are placed in jam jars with an inch or so of soil in the bottom they will soon make roots, especially if they are placed in a sunny position. Once roots have been formed it is quite easy to remove the rooted cutting, still with some of the soil adhering, and plant these carefully into the tank. Some of the sand can be scraped away and then returned over the roots. This does give the plant a chance, and as there is not a great deal of soil introduced into the tank the newly forming roots will still have to search for fresh food and so assist in promoting healthy compost in the tank. When trying to introduce a new plant into a well-established tank it is essential that the same process is carried out. It is not easy for any plant to get well rooted into a compost already riddled with roots from other plants.

Another very important factor in the successful growing of water plants is the amount of light the plants receive. Without plenty of light few plants will flourish; it is very difficult to lay down any hard and fast rules for providing the necessary amount of such light. Not only will this depend on the position of the tank in the room or fish-house but also on the weather. It is always safer to use a fairly strong wattage lamp for illumination purposes than to try to manage with a low wattage one which is never able to supply sufficient light even if on nearly all day. Providing a tank is placed near a window it will be found that for a 24 ins. by 12 ins. tank two 25 watt lamps will be sufficient.

If the tank is well away from a window and does not get much natural light it may be necessary to have double the wattage of lamps. The time which these lamps will have to be kept on can only be learnt by experimenting. If a tank is placed end on and near to a window it may not be necessary to have the lights on except during dull weather and then only for short periods. Tanks further away will probably have to have the lights on every day for some hours if the plants are to thrive. Naturally the larger the tank the more light will be needed, and also the deeper tank will need extra. Some aquarists are in doubt as to the advisability of using fluorescent lamps. I have heard of many who have tried these without success and who have been forced to return to the use of the ordinary types.

Having given some advice as to the correct methods of planting it may be useful if I give some reasons for non-success with plants. One point is the fact that some tanks have a clear glass at the base exposed to light, and this is not at all encouraging for the formation of roots. All glass-based tanks should have this blacked out completely by paint or a sheet of dark paper should be pasted there. Another cause of failure at times in tropical tanks is the

*(Please turn to page 106)*

## "Operation Spring-clean"—aids to Tidy Tanks



Photographs by  
C. TOMS

BEFORE



**A**FTER algae has been scraped from the glass, using a razor blade in special holder (above) the aquarium bottom is siphoned to remove sediment. Next the sand surface can be lightly raked with a table fork tied to a stick (left, below) and planting sticks used to cover exposed roots and set new plants (right, below).



**A**QUATIC plants need pruning to keep them within bounds, and convenient tools for this job and for removing dead leaves are the "Aqua-Scissors" and "Aqua-Tongs" (Kingston Exotic Fisheries) shown in use in the picture above. The tongs are valuable also for removing dead snails or objects accidentally dropped into the tank.



"Hand Rejector"



"Sedijet"

**R**EGULARLY-given attentions to the aquarium ensure that it will never become as bad as the one pictured at the top of the opposite page. Across the top of this page are pictures showing three methods by which an aquarium may be cleared of sediment without removing any great volume of water. On the left is the hand-operated "Rejector" (Windmill Products), which collects sediment lifted into the bag by air from a squeezed rubber bulb; a similar apparatus can be used connected to an air supply from an aerator at cleaning time. In the centre picture is an all-glass "dip tube" sediment remover, useful for removing mulm collected close to rocks, operated by lowering the tube over the mulm whilst the



top end is closed by a finger. When the finger is taken off water and mulm enter the bulb. On the right is shown the "Sedijet" cleaner being used just like a vacuum cleaner, with an air supply from an aerator, or a hand bulb can be used for this purpose. When a very dirty aquarium is being cleared it is inevitable that small particles of sediment will become suspended in the water, making it cloudy, and it is then that a filter becomes specially helpful. In the adjacent photograph the "Glen Monarch Filter" is seen doing its work, the discoloration of the glass wool at the top of the wide glass tube indicating the large amount of suspended matter collected after ten hours' filtration. Part of the filter's air supply has been diverted to the aquarium via a diffuser stone.

**AFTER**



## AQUARIST AT HOME:

# Mr. W. S. Perrin

(DEWSBURY)

Interviewed and photographed by JAS. STOTT

SOME ten years ago Mr. W. S. Perrin of Dewsbury became interested in fishkeeping as a hobby. He commenced with the coldwater side of the fancy and twelve months later extended his activities to include tropical species. To-day, his spacious establishment illustrates how far enthusiasm and interest will take a man in the pursuit of an absorbing pastime. When I visited this aquarist the ponds, etc., were only in the sombre dress of late winter but it was easy to see how attractive the display must be in the height of the summer season when, all being well, I should like to make another visit.

Mr. Perrin's fish-house, which is generally heated by hot water pipes, is a converted greenhouse 30 feet in length, 12 feet wide and seven feet high to the ridge. A strong wood staging along the sides holds twenty tanks ranging in sizes 24 ins. by 12 ins. by 12 ins. to 36 ins. by 15 ins. by 15 ins. They are situated at regular intervals and between the tanks is to be seen a collection of cacti, succulents and other greenhouse plants, another interest of Mr. Perrin. At one end of the fish-house is a raised, formal type of pool 10 feet long by five feet wide and two feet deep which not



Mr. Perrin relaxes in his fish house against a background made by tropical aquaria and cacti.

only makes a useful component but its pleasing design adds charm to the fish house. The corners of this pool are bricked across to provide marginal space and planted with irises (*Iris pseudacorus*). There is also a centrally placed, circular planting area supported well above water level, offering normal soil conditions, containing succulents and geraniums. The base of the pond is covered with gravel and planted with submerged aquatics such as *Elodea*, hornwort and *Myriophyllum*.

At one end of the pool is situated artificial rockwork (concrete) and over this, when the pump is in operation, tumbles a miniature waterfall at the head of which stands the well-known "Perrin's Pixie," a colourful figure with a most mischievous expression on its face. On each of the pond side walls is fitted a submerged lamp to provide underwater illumination. The pond is stocked with common goldfish, shubunkins and golden orfe.

In the spring the common goldfish and the golden orfe are transferred to an outside pond leaving the shubunkins to breed in this inside pool. After spawning has occurred the plants with the eggs adhering are removed from the pond and the hatching and rearing is carried out in nearby tanks. Up to the present Mr. Perrin has only tried the hardy water lilies in his fish-house pond but he intends to try one or two tropical *Nymphaea* this year.

In the tropical tanks could be seen fighters, angels, platys of different varieties, swordtails, mollies, neons, mountain minnows and several species of tetras. This aquarist is especially interested in fighters and has done a lot of breeding with the species. Mr. Perrin is the founder of the Dewsbury Aquarists' Society and now holds the official position of show manager of that society.



Part of the fish house pond, showing the artificial rockwork "cavern" at one end.

## Stepping Stones

(continued from page 103)

placing of a heater under the compost; some roots do not like this. In conclusion, when things are going wrong do make some experiments with your lighting, etc., and compost to see if you cannot trace where you are at fault. There is usually a solution to your problem which may be found easily by adjusting conditions.

## White Cloud Mountain Minnow (*Tanichthys albonubes*)



ORDER:—Ostariophysi, from Greek *ostarion*—a little bone, and Greek *physis*—a bladder.

FAMILY:—Cyprinidae, from Greek *kyprinos*—a kind of carp.

SPECIES:—*Tanichthys albonubes*, from Tan—name of finder, Greek *ichthy* or *ichthys*—a fish, and Latin dim. *albus*—white, and Latin *nubes*—a cloud.

WHITE cloud mountain minnows were first introduced into this country about eighteen years ago, having been discovered some four years earlier by a Chinese called Tan near the White Cloud Mountain, not far from Canton. They made an immediate hit with those aquarists who were privileged to see them, and have been firm favourites ever since. Nor is this hard to understand when we consider their many outstanding qualities and unusual beauty.

Seldom exceeding an inch and a quarter in length, they are beautifully proportioned and symmetrical in outline. No signs of humpback, hollow belly, or obesity about these little creatures, and no fussiness over temperature or food, providing always this latter is small enough for them to tackle.

### A Cool Species

While mentioning temperature, however, I feel that, originating as it did in a China river, receiving melted snow from neighbouring mountains, it is somewhat difficult to classify this fish as a "tropical," and that many failures could be attributed to keeping specimens in warm water (from 75° to 80°F.) for too long at a time. It is infinitely happier in water not exceeding 72°F. and quite active and hungry in the lower sixties.

Spawnings have been reported at temperatures varying from 68°—80°F.—an unusually wide range. Methods of spawning too, vary between using a trap and no plants and using a densely planted set up. Among commercial breeders in America, or so we are told, it is customary to use wire mesh traps, the size of the mesh being  $\frac{1}{4}$  inch. As the eggs are only just over a millimetre in size this seems to me to be unnecessarily large. Indeed, the average mountain minnow could swim right through the mesh without much difficulty. A mesh of one sixteenth of an inch would be safer.

Alternatively, a mat of glass bars, or a floor of pebbles or marbles could be used. Plant users can prepare a mat of fine-leaved plants by weighting down bunches of *Myriophyllum*, *Cabomba*, or *Ambulia*. Water depth is reduced to about six or seven inches to ensure the non-adhesive eggs reaching cover in the shortest possible time, before the parents have a chance of eating them. This they are fond of doing, and similarly with the fry. To protect the latter, who work their way up the glass sides of the aquarium, a bunch or two of plants should be planted in the ordinary way.

Both methods—with weeds and without weeds—are successful, but I must confess I lean towards the weedless method. With plants it is so easy to introduce the eggs of pests, or small carnivorous creatures whose presence is undetected until half or more of the fry or eggs are gone. Moreover, in a trap it is the simplest thing in the world

to lift out the fishes after they have spawned and leave the spawning tank as a rearing tank.

Spawning is frequently a long drawn out process. The males drive the females for several days, with time off for meals and rest, of course. Often, in fact, the earliest eggs thrown are hatched before the spawning drive is finally completed. For the first 48 hours or so after hatching, the fry are invisible, and then appear as brilliantly coloured splinters of glass upon the glass of the aquarium sides. At this early stage, and for a matter of nine or ten weeks afterwards, they rival neons in their beauty.

With perhaps a week difference in their ages some are bigger than others, and the larger are a menace to the smaller. Therefore it is wisest, if possible, to net out the youngsters as they are seen, and sort according to size. I say "net" out. A fry catcher, or a fountain pen filler is one of the best means of catching them without causing damage.

Feed them Infusoria, rotifers, brine shrimp, micro worm, *Cyclops* nauplii, *Cyclops*, spineless *Daphnia*, etc., etc. Watch these catches of live food for the presence of *Hydra*, water beetle larvae, and other carnivorous pests.

Aquarists sometimes remark that there are two colour varieties of *Tanichthys*—one with a dorsal showing red in the upper portion and a second with the red at the base of the dorsal. It now seems possible that the one with the red at the base is actually another species of fish—*Aphyocypris pooni*—from a different part of China. The different coloration of the dorsal seems the only means of telling the two species apart. There also appears the possibility that these two species have interbred, which might complicate things no end.

*Tanichthys* are suitable for inclusion in a community tank, being peaceable and not fussy over food or temperature. I would stress again, however, that too high a temperature for too long a period will weaken them and shorten their lives.

The argument still continues that mountain minnows and zebra danios are incompatible, and that the presence of both species in the same tank will adversely affect the zebbras. Some aquarists vehemently deny this—others just as forcibly state that it is a fact. In the final analysis we must all go upon our own experience. The aquarist who keeps them together and experiences no difficulty is obviously going to continue to do so. On the other hand if an aquarist suspects minnows of harming his zebbras, the common-sense thing for him to do is to separate them. Then everyone will be happy.

### Post-Mortem Examination of Fishes:

W. Harold Cotton, F.R.M.S., F.Z.S., 36, Brook Lane, King's Heath, Birmingham, 14. (Phone: Highbury 1693)

Specimens should be sent direct to Mr. Cotton with full particulars of circumstances, and a fee of 3s.

It is important that the following method of packing fish be adopted:—Wrap fish, very wet, and loosely in grease proof paper and then in wet cloth. Re-wrap in grease proof or wax paper and pack around with cotton wool in tin box. Despatch as soon as possible after death, with brief history of aquarium or pond conditions.

# *Polycentrus schomburgkii*

by JACK HEMS

**W**ALKING round the aquarium department of a large pet store the other day, my attention was arrested by a tank containing a large number of small dark fish which were hurrying to and fro through the dimly-lit water as though engaged in some very important business.

Now and then one or two of them would detach themselves from the rest and pause in what seemed like earnest contemplation of a slow-moving *Planorbis* snail, or a yellowing stalk of *Cabomba*. A few of the fish were huddled together in a depression in the sand.

Approaching more closely to the glass front of the aquarium, I was pleased to see that the fish in question were young *Polycentrus schomburgkii*, a species which enjoyed considerable popularity before the war. In those far-off and, in many respects, happier days, the fish commanded a high price because the species has never bred very freely in captivity, and long journeys across land and sea do not suit it. So whether or not the improved method of fish transportation will result in an appreciable fall in price remains to be seen; but in any case, the fish is definitely worth the above-average price asked for it by the dealers because it is out-of-the-ordinary in appearance and habits.

The species is native to Trinidad, Guiana, and the Orinoco basin. It belongs to the family Polycentridae, members of which are noted for their protractile mouths and transparent dorsal, anal, and caudal fins. It reaches a length of about two and a half inches; above this length in the wild state.

The basic or ground colour is not easy to define, for, like its close relative *Badis badis*, the fish is chameleon-like, and may be light olive one moment and dark olive the next. The side is crossed by four or five dark bars. These vary in width and depth of colour according to the mood of the fish, and the sort of light in which it is seen.

A number of black spots and white spots and pearly dots may or may not show on the body when you look at it, for these markings, too, are extremely variable. The eye is large, black, and rimmed with shining gold. A black boomerang-shaped marking passes through the region of the eye and links the dorsal fin with the ventral fins. The mouth, as mentioned above, can be opened out like the folds of a concertina, and is well adapted for seizing and swallowing smaller fishes.

For this reason alone, it is unwise to keep fully grown *P. schomburgkii* in a community aquarium containing such little gems as neon tetras or scarftail guppies. It is not, however, a vicious fish, and behaves itself very well in the company of larger barbs, gouramies and the like.

As will be readily realised, *P. schomburgkii* needs a diet of live food. Some specimens can be trained, as it were, to accept pieces of meat or white fish, but others steadfastly refuse to eat anything but small living creatures such as white worms, *Tubifex* worms, mosquito larvae and similar water life. The fish eats a lot for its size, and should be fed at least once every day.

*P. schomburgkii* does not appreciate heavy doses of sunlight or strong electric light; so its aquarium should be placed in a partially shady position, and set with the few plants which can be guaranteed to flourish in such conditions, as, for example, *Cryptocoryne cordata*, *C. willisii* and *C. griffithii*. Any temperature in the seventies suits it.

But if you wish to try your hand at breeding it, then you should give it a little more heat, say about 85° F.

The sexes are not easy to tell apart, though it seems true enough that in and out of the breeding season the male is darker coloured than the female; and then again, most female fish of most species show plumper sides when they are ripe for spawning.

It is said by most trustworthy writers on tropical aquarium fishes that *P. schomburgkii* is more likely to raise a family in the aquarium if the water is made slightly saline by the addition of some sea salt. But do not overdo the salt. A teaspoonful to every gallon of water in the tank is quite enough. More than this will not harm the fish; but the plant life will suffer, and decaying and dying plant life soon pollutes the water and makes it totally unsuitable for breeding any fish.

*P. schomburgkii* is rather particular about its choice of a spawning site. Sometimes the adhesive eggs are deposited on the underside of a broad, flat leaf; sometimes they are hidden away inside a cave formed by piled-up lumps of flat stone. Some aquarists provide a glass jar or flower-pot turned on its side for the reception of the eggs. When such a receptacle is provided, the mouth of the receptacle must be turned away from the light, and preferably out of view of the aquarist's prying eyes; for the fish resents being spied on—that is, when breeding.

The eggs are usually laid on the underside—the roof, so to speak—of the receptacle provided, and after spawning is over, the female may be removed to another tank. The male now mounts guard over the eggs, which should hatch out within four days. When the fry hatch out, they usually cling to the spawning ground for a few hours before dropping down into the water; or rather to the floor of the aquarium. Before the baby fish start to move about, the male fish usually fans the sediment away from the sand beneath the spawning site.

Once the fry have emerged from the eggs, it is not long before they need food; so it is important that the aquarist has plenty of Infusoria on hand, to be followed by micro worms, newly hatched *Daphnia*, or, even better, newly hatched brine shrimps. When the fry are about a fortnight old, if not sooner, the male fish may be netted (after dark to save harming the fry) and reunited with the female.

Fully grown *P. schomburgkii* are not very active. They prefer to lurk in the plant life and in dark corners of the aquarium until the introduction of food brings them dashing out into the middle of the water; for like so many predatory fish, *P. schomburgkii* is extremely alert to every movement in the water, and can show a remarkable turn of speed when food is about.

## Book Notice

A new Florin Colour Book has recently appeared under the title *A Child's Book of Fishes*. The title is very misleading as the book is more than suitable for adult reading and well worth a place on an aquarist's bookshelf. Produced in the best American book tradition this publication contains 17 coloured plates and 13 other large illustrations of unusual fish, and the text deals with 23 different varieties of fish, as follows: coelacanth, sturgeon, sea lamprey, electric eel, manta ray, sawfish, sharks, four-eyed fish, trunkfish, flying fish, archers, porcupine (puffers), garfish, deep-sea luminous fish, angler, African lungfish, seahorse, ocean sunfish, climbing perch, mud skipper, salmon, carfish and coral reef fish. It will be seen that many of these are of more than passing interest to hobbyists, who will be well advised to obtain a copy for club libraries. The book costs 2s., contains 28 pages, roughly eight inches by six inches, and a beautifully illustrated glossy front cover.

RAYMOND YATES

## OUR EXPERTS' ANSWERS TO READERS' QUERIES

Some of my black mollies have developed ulcers on the body. These seem to be eating into the tissues and forming holes. How should I set about treating these sores or ulcers?

If you are not too squeamish to perform a minor surgical operation, we advise removal of the top of the ulcer by incision—we suggest the use here of a pair of upturned surgical scissors or a razor blade—and swabbing the bare spot with cotton wool dipped in mercurochrome or 50 per cent. solution of iodine and water or acriflavine. After swabbing, apply a smear of Vaseline or germicidal ointment to the wound. We must say at once though that these little adventures in surgery must be performed with all possible speed, the fish being held in a soft cloth rinsed out in tepid water, and returned to the water in under a minute.

I have six young Jack Dempsey fish (*Cichlasoma biocellatum*) in a tank planted with *Cryptocoryne*, *Sagittaria*, etc. I should like to breed these fish later in the year, but do not know how to tell the sexes apart. Please can you tell me how to distinguish a male from a female?

When your fish reach a size of about four inches, it should not be difficult to tell the sexes apart, for the male fish develops richer and more sparkling colours than the female, and his dorsal and anal fins become fuller and more pointed. But we must warn you that when your fish attain a larger size, if not before, they will not tolerate plant life in the aquarium. The frailer sorts will be torn to pieces; the larger and stronger sorts will be uprooted as fast as they are re-set in the sand.

Can creeping jenny (*Lysimachia nummularia*) from the garden be grown successfully in the tropical aquarium and, if so, is it any good as an oxygenator?

Creeping jenny soon becomes stringy and dies in the tropical aquarium. It will live for several months, however, in a coldwater aquarium. But the plant is not much use as an oxygenator.

The plants in my tropical aquarium are being nibbled to pieces by water snails which were introduced into the aquarium by accident. Can you please tell me how I can get rid of them?

You can keep their numbers down by picking them off the sides of the aquarium every time you remove the cover glass to feed the fish. But the least troublesome way to exterminate them is to introduce some young cichlids or paradise fish into the aquarium. These fish will soon make short work of all snails. But do not permit the snail-killing fish to stay on in your aquarium if you have any small fishes in it, or else they will quickly go the same way as the snails.

I have several large tanks in a greenhouse. But although I have planted the tanks heavily with a variety of plants, everything in them becomes coated with a dark-green, oily-looking algae. How can I get rid of this algae, or keep it under control?

We wonder whether you have given any thought to the compost you are using in your aquaria? Many aquarists troubled with algae diminish the light entering the aquarium, discard rockwork, make sure that no excess food is coming into contact with the water and so on, but fail to realise that the compost itself may be the cause of the trouble. Some time ago, a writer in an American aquarium magazine dealt at length with composts and the effect they can have on the growth of algae and the well-being of fish and higher plant life. He stressed the importance of a lime-free compost, and suggested pouring acid over the sand used to cancel out the danger of high alkalinity. We think it would be a good idea to test your compost for a lime or chalky content. A cupful scooped from the bottom of one of your aquariums should be sufficient for the test. Empty it into a clean glass jar or glazed basin and let the water drain away. Now pour a small quantity of hydrochloric acid on top of it. If it fizzes and bubbles, then you may be

---

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

---

sure that it is calcareous and is encouraging the growth of algae. The thing to do now is to take all the compost out of the aquariums, treat it with acid, wash under running water, and replace in the tanks. Peat water is inimical to algae growths, and if you can find time to strain or filter the water in the aquaria through peat, we think that a lot of your troubles will come to an end.

About three weeks ago I bought an angel fish, but up till the time of writing I cannot get this fish to take much food. Please can you tell me what I should do to prevent it going into a decline?

Angel fish are very temperamental and often react most unfavourably to a sudden change of water or environment.

Probably the shock of being transferred from the dealer's tank to your own aquarium has put it off its food. You should do your utmost to tempt it to eat freely again. Perhaps the sight of wriggling whiteworms falling through the water close to its mouth will induce the desired reaction. You cannot do more for the fish other than tempt it with live food, see that it is not worried by other fishes, and make sure that the temperature of the aquarium remains reasonably constant.

My plant life seems to be dwindling away. I cannot understand it, for the fish in the same aquarium are perfectly healthy, and I add a teaspoonful of salt to the water every week.

We think you are introducing too much salt into the aquarium. A teaspoonful every week is far too much. Actually, once an initial supply of salt has been added to aquarium water, there is no need to add any more. Although most species of fish will stand quite a lot of salt in the water, most plants do not like it, and show their disapproval by turning yellow and dying down.

A short while ago my female black molly gave birth to a number of young. These baby fish seem healthy enough, but instead of being all-black like their mother, their bodies seem to be mottled with greyish and silvery-white patches. Have the baby fish contracted some disease?

We do not think there is anything wrong with your young mollies. Some young mollies do show light patches on the body, but as they mature these light patches become smaller in area and may completely disappear. On the other hand, some black mollies show pale areas on their bodies all their lives. First-class black mollies should be matt black all over. You might improve your mollies' coloration by feeding them with Bemax and by adding about a teaspoonful of kitchen salt to every gallon of water contained in their aquarium.

I have just been reading a book on tropical fishes by an American writer, and he mentions some fish called mudspringers, gobies and kissing gouramis. These fish sound highly interesting, and I have been wondering whether I could obtain them in this country. Please can you tell me whether such fish are obtainable in this country?

The fish you mention do come into the country on occasions, but, as a rule, are not very cheap to buy. One goby, the bumble-bee fish or wasp goby (*Brachyogobius xanthozona*) is quite common, and comparatively cheap; the mud springer (*Periophthalmus koelreuteri*) needs special conditions, and is expensive; the so-called kissing gourami is often seen in the tanks of the better-stocked dealers' establishments, and young ones may be obtained for about £1.



Photo:

Laurence E. Perkins

Wasp goby (*Brachygobius xanthezon*)

One or two of my swordtails seem to be developing small pimples or lumps on their bodies. What should I do to get rid of these disfigurements, please?

You can try painting the affected parts with strong salt water, mercurochrome, or diluted iodine. If such treatment does not do any good, then the best thing to do is to perform surgical incision. Wrap the head of the fish to be operated on in a piece of fine muslin or nylon rinsed out in tepid water, steady it on a pad of damp cloth, and cut the top of the lump away with a sharp razor blade. Immediately after the operation, swab the exposed part with a mild antiseptic and smear with Vaseline or acriflavine ointment before returning the fish to the water. As you will readily understand, the fish must not be kept out of the aquarium for more than a few moments.

Can you tell me how to prevent my fighting fish eating their eggs? After laying eggs, both fish disturbed the bubble-nest, and did not rest until they had eaten every egg in it.

Are you sure your fish actually ate the eggs? Fighting fish, paradise fish, gouramies and other anabantids like to rearrange the eggs in the nest, and spend a lot of time fussing over them. Usually, the male takes full responsibility for them, but the female will do her part, too, if the male is good-natured enough to let her approach the nest. On the other hand, some couples are badly behaved and will eat several lots of eggs before settling down to raise a family. Fear will often cause fish to act unnaturally. When fish are intent on raising a family, it is best to leave them alone as much as possible, and do not keep staring into the tank, or tapping on the glass or dropping food near the frothy mass of bubbles.

I should like to keep a marine tropical aquarium. Would ordinary packet salt be strong enough to make imitation seawater?

Unfortunately you cannot make seawater; or rather you cannot make it sufficiently like the real thing to keep marine animals in it. You must start with some real seawater, but you can add sea salt in solution in tapwater in the correct concentration to this. Make good losses due to evaporation with tap water.

Can you please tell me which is the best to use to layer the floor of my tropical aquarium: washed builder's sand or ordinary gravel?

We recommend proper bagged sand sold by reputable aquarium dealers. If you cannot obtain this locally, we suggest that you visit a local fast-flowing stream and scoop up in a bucket sufficient sand off the bottom to cover the floor of your aquarium. But before you introduce this stream-bed sand, wash it well under a running tap, and then pour boiling water over it. Builder's sand may prove suitable, but in some cases it causes no end of trouble. It often contains particles of limestone or old mortar which lead to a sharp rise in the alkalinity of the water and make it unsuited to fish life. Some plants will prosper in this sort of water, but even these do not care for water which is too hard.

## COLDWATER FISHKEEPING QUERIES *answered by A. BOARDER*

I have a tank 30 ins. by 15 ins. by 12 ins. with aerator and wish to stock it with the most colourful fish other than goldfish and shubunkins. What can I use?

For your coldwater tank you can choose from: golden orfe, golden tench, golden rudd, sun fish and coldwater-bred paradise fish. You must realise that apart from the paradise fish these fish will grow to a large size and can get too large for your tank. Obtain very small ones of the types you require and do not overcrowd them. Keep in mind the maximum inches of fish for your tank—one inch of fish to each 24 square inches of surface area.

I have made a garden pond and now wish to stock it. Shall I put in some water snails and mussels?

I know that it is sometimes said to be imperative to add snails and mussels to the pond but this is not fact. The snails are a mixed blessing. The only use they have in the pond is that their young provide some food for the fishes. As the fishes mostly eat them only when they are first hatched they are so small that the amount of food is very small. On the other hand snails can eat water plants and will certainly eat some of the fish food. What they do not eat they can spoil by sliming it. They can eat fish eggs and so you can weigh up their good points against their bad ones and act accordingly. As regards the mussels it is rather a different proposition. Some people like to assert that

mussels keep the pond water clear. A happy thought but at least in the case of a newly made concrete pond a false one. Pond mussels live and move about in mud or mulm in the bottom of the pond and if introduced into a freshly made pond they would be unable to move around and feed. In consequence they would soon die; if you have never smelt a dead and decaying mussel you have a treat in store! I used to think that the worst smell was that of a rotting camel in a desert, but a dead mussel runs it a near thing.

I have a two-year-old veiltail which has developed two red patches on its body and now has red on the two front fins and the dorsal. I have tried the salt bath but should I do anything else with it?

First of all isolate the fish from the other occupants of the tank. I find that few aquarists think of doing this. No harm is done by isolating a fish and you may prevent the spread of the trouble to the other occupants. It is fairly safe to try a salt bath, but remember this is not a cure-all for all complaints. Perhaps it is the safest one, as some people immediately fly to all sorts of chemicals with which to treat their fish and often do more harm than good. The red patches can be caused by several things. They may be the result of damage through a knock, or rubbing on rocks, but this is not likely as far as the fins are concerned. The fins may have fin congestion which may have been caused by



a chill or indigestion. Again the red may have been caused by some external parasites such as flukes, argulids or leeches. Unless you can discover what has actually caused the red marks it is difficult to try to effect a cure. Salt will not kill flukes, not at a strength which would be harmless to the fish. If flukes were present it would be reasonable to suppose that the fish might have dashed about along the bottom of the tank fairly often and rubbed against things in an effort to rid itself of the pests. A strong magnifying glass should show you the flukes if any are present. They appear often seen only on the edges of the fins, as transparent leech-like creatures, very tiny, generally holding by one end and waving the other about. If any flukes are seen use the Dettol treatment. If nothing can be seen, keep the fish in slightly warmer water and add a tablespoon of sea salt to a gallon of water. Let the fish stay in this for a few days and then gradually lessen the strength of the salt by adding fresh water. Feed when possible with live foods.

**I am replanting and setting up my tank. Is it advisable to use peat in the bottom? I have heard this encourages white spot disease.**

I do not see why peat in a tank should encourage white spot. This is a parasitic trouble and is not any more likely to be found in peat than in any other compost. On the other hand I do not see the need for peat in a tank. In horticulture it is used extensively in potting mixtures, etc., as it has the power to hold moisture considerably. Where this property can recommend its use in a tank escapes my reasoning.

**My tank has a slate bottom which I suspect is very heavy. I wish to place some rocks in the tank. How many can I safely use and what weight should they be?**

Do not worry much about the weight of the rocks in the tank as they are not likely to weigh any more than the water they displace. On the other hand do not overdo this rock business. The tank is a space primarily for fish to swim about in and the more rockwork you put in the less room will the fish have. A small rock or two suitably placed can add to the attractiveness of a tank, but see that those used are placed with discretion. Their only use is for ornament so do not place a big one dead central in the front of the tank. Try to imitate what you would see in the base of a rocky stream. See that the rocks have no sharp edges and that fish are not going to be trapped behind them. Also, remember that if the bases of the rocks are not well covered with sand they can hold much decaying uneaten food.

**I have a first-class veiltail which has developed swim-bladder trouble. I have attempted to cure it by the usual methods with no success and have also tried the "Bennett cure" also with no avail. It has always been kept in warm water. What can I do now?**

The trouble with trying to recommend a cure for swim-bladder trouble is that I do not know what has caused the mischief. If one can work out by diagnosis what has been the chief cause one is half-way to finding the cure. Try to think if you have done anything unusual to the tank water, or used strange foods lately. In my experience the following can be causes:—hereditary (bred from parents), a chill, indigestion, the sudden swelling up of the eggs or milt, a blow such as the fish being dropped, the formation of an internal growth or cyst and bad conditions in the tank. From this it can be seen that unless one is fairly certain what has caused the trouble it is difficult to suggest a cure. As for the said Bennett cure I had a friend who was cleaning out a tank of goldfish and when removing the fish he placed them by mistake in warm water, and they immediately died. Not knowing what has caused your fish to go wrong I can only suggest that it is kept in shallower water than usual and that live food only is given. You can add a little salt to the water and you may find that the fish will soon show signs of improvement.



Photo ;

Laurence E. Perkins

**If I use flower pots for planting large types of water plants in my pond how can I prevent them from being blown over?**

Place the pot on a sheet of paper and surround it with a mass of concrete. When this sets wash it well and you will find that it will stand up to winds and will enable you to slide the whole from the pond easily when cleaning is carried out.

**I had a young oranda which suddenly died. At 8 p.m. one night it was all right, and at 9 p.m. it was dead. The fish was sent for post-mortem and the cause of death was given as gill flukes. I treated the other fish with Dettol but when returned to fresh water they sank to the bottom for a time before swimming about normally. Is this the usual reaction?**

The reaction you describe is usual when fish are returned to fresh water after having had a Dettol bath. There is nothing to worry about. However, I am not too happy about the description of the death of your fish. I have never known a fish die suddenly from fluke trouble, although I know I have a lot to learn. Normally fluke trouble is one of the easier troubles to cure as it lasts such a long time before proving fatal. I have known fish attacked by flukes live for four or five weeks, getting weaker each day. The usual course is for the fish, when first attacked, to dash about in an effort to get rid of the pests which are causing some irritation. After some days the fish goes off its food and keeps mostly to the top of the water. The fins then fold up and after another week the fish starts to get hollow-bellied. It then wobbles aimlessly about at the surface of the water mouthing around at food but not being able to take any. Young un-coloured goldfish develop a kind of "bloom" or "meal" all over the body and after another week or so slight blood streaks can be seen on the body and fins. This is near the end and the fish may not live more than another week. If fish are treated within a fortnight of infection they can generally be cured. If, however, the trouble is allowed to persist for a month it is naturally more difficult, but not impossible, to cure.

## our readers

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

### Marine Aquaria

I AM sure all serious marine aquarists will join me in saying that Mr. Boursot's article on the easiness of keeping a marine aquarium is anything but helpful.

Filling a small tank with lumps of tropical coral is only one step to the china mermaid and sunken galleon. It adds nothing to our knowledge of marine life, still in its infancy. London Zoo, as honest as it is vigorous and progressive, regrets having to filter sea water and admits that filtration robs it of half its "kick" and greatly restricts the range of animals that can be kept. Hermit crabs, for example, semi-plankton feeders, never thrive in filtered sea water for long.

The "no sea weeds" policy is now as exploded as the balanced aquarium myth. One of my tanks only 12 ins. long has supported three blennies for over two years and has a miniature forest of *Enteromorpha*, and with good aeration supports well the charming *Corallina*. Sea water aquaria are not easy to keep—never have been and are never going to be—ask any Marine Research Station.

L. R. BRIGHTWELL,  
Peacehaven, Sussex.

### Heat Insulation

THE need for a double-walled fish house is great, as any aquarist will tell you, but on the other hand, it can be expensive as I found out when I decided to panel my shed. I first priced asbestos and several other materials that were suggested to me by friends, but all were too costly, so after it had been suggested to me by another friend, I decided to panel the shed with hessian. Yes, hessian! In other words, plain, everyday sugar bags.

First I built a framework of 1 in. by 1 in. wood on every wall. Then taking a sugar bag, I split the seam to give a large sheet of hessian, which in turn was tacked with half-inch nails on to the frame, but in doing so I made sure to pull the material tight. On finishing this gave a surprisingly neat appearance. The next thing needed was a substance with which to harden the material, so size was used to give the hessian several coats. This gave a hardened surface so much that when a coat of paint was added it could mislead people into believing it was wood. So as you now see I panelled a fish house 12 ft. by 6 ft. for approximately £1 with very satisfactory results.

E. W. STINTON,  
West Bromwich,  
Staffs.

### Metals and Water

HAVING read a recent Editorial note on the effect of different metals on water used for fish I thought this would interest you. I started breeding black mollies two years ago and during that time I have bred two hundred without the loss of a single fish. I have five tanks and have always used water from an old galvanised iron tank supplied from the roof. The water when drawn off is quite clear, but when heated rust floats on the top. I skim off as much as possible but there is sure to be some left. I have not added salt to the water at any time.

A. A. CHECKETTS  
Evesham, Worcs.

### Hardy Fishes

A FRIEND gave me some *Cabomba*, which I carried home wrapped in dry newspaper. I was unable to plant it in my aquarium until 42 hours later, and later the same day I noticed a tiny red fish in the tank. I consulted my friend and found that he had a female red swordtail which had produced a brood two days prior to the removal of the plants. My small red fish is one of his swordtail brood which had survived for 42 hours in the damp plants, out of water!

R. J. CHARNOCK,  
St. Helens, Lancs.

WALKING down the road one day I noticed broken glass, coated with dried algae, scattered in the gutter. Beneath a large piece of glass was a catfish, lying on the completely dry ground. It was not dead, however, for its throat showed a very small pulsation, and I picked it up and dashed home to place it in my aquarium. It sank like a stone in the water and lay quite still on its back. But while I watched the throat movement became stronger and stronger, until after about ten minutes the fish flicked its tail, somersaulted on to its belly, and five minutes later began swimming round the tank.

This happened three years ago, and the fish has just died after being transferred from my aquarium to a goldfish bowl because of the disappearance of a minnow from the tank and the increasing tears and raggedness in the fins of my goldfish as a result of its activities.

W. D. ROLFE,  
Maidstone, Kent.

### Badis badis Spawning

ON 21st May last I noticed a pair of *Badis badis* very active and seemingly wanting to spawn, and as I knew nothing of their breeding requirements I wrote for the F.N.A.S. Bulletin (No. 4) which deals with this species. Next day it seemed that the information would arrive too late so I put the fish in a 19 ins. by 13 ins. by 10 ins. aquarium which had been set up since September last year with sieved coal in place of gravel and planted with *Vallisneria*, *Cryptocoryne* and Indian fern. There were *Daphnia* present in the tank, and it was lighted by a 60 watt bulb.

On the morning of the 23rd May the fish were "milling" around in one corner of the tank, and that evening I had to remove the female, since the male chased her away from the corner if she ventured near. He seemed to be fanning the white eggs, which showed up well against the coal, with his tail, but next day he was nose down over the eggs and thinking he might eat them I removed him also. On the 25th May my Bulletin arrived, and as it advocated absence of lighting I expected no hatching since the tank had been lighted for eight hours daily.

I switched off the light and on the 27th May I noticed about 20 fry free-swimming, and the following day the tank seemed alive with fry. I fed them with "Liquifry," and up to the time of writing, when there are about 80-90 fry, this has been their only food; they are ready to take micro worm and brine shrimp, being almost a quarter of an inch long. The presence of the *Daphnia* has not interfered in any way with the rearing of the fry.

G. KOHLER,  
Sheffield 8.

### Heating Failures

AS a manufacturer of a certain temperature-change alarm, it would be unfitting to discuss the merits of any particular system, but I would like to offer an unbiased opinion on one or two aspects of this important subject.

Mr. Watts, in his article (*The Aquarist*, March), suggested the use of two heaters as a safeguard against cooling, and Mr. Bell has subsequently decried this, as being too dangerous from the reverse aspect. Two heaters, operated from a single thermostat are, of course, an absolute menace if the thermostat sticks "on." And, it being my business to enquire about such things, I find that on the average overheating accounts for 75 per cent. of the disasters which occur. This indicates that the provision of excess heating arrangements would ensure the death of the fish, three times out of four. To my mind, any system of warning which will indicate a fault is infinitely better than covering up such faults by the duplication of this, that and the other.

Finally, a word, if I may, about the source of power for alarm units. It may be interesting to aquarists to know that sales of one commercially produced alarm are in the proportion of twelve mains models to one battery model. I agree with this mass-opinion of users, for the following reasons:

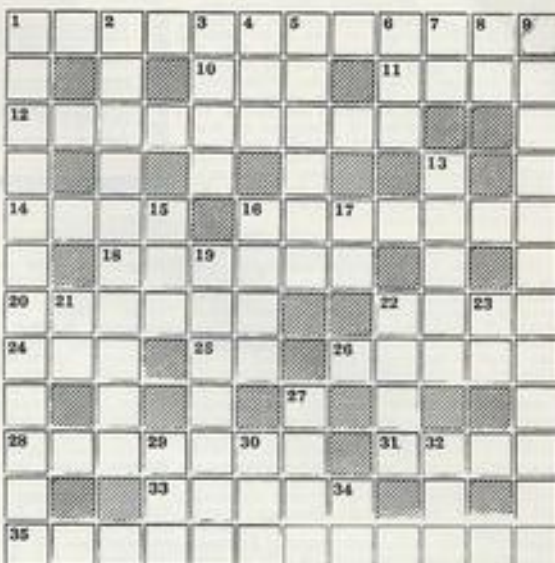
- Mains power cuts are very rare, nowadays.
- When they do occur, the duration is not long enough to produce dangerously low temperatures, except in very isolated instances.
- The battery, as a source of power, is more trustworthy than domestic supply only in so far as one is prepared to keep constant check on its condition. There is also the trouble and expense of periodical renewal, and the permanent question "exactly when should I replace it?"

On the whole, I think the mains is the best bet.

L. WARBURTON,  
Stockport, Cheshire.

## The AQUARIST Crossword

Compiled by J. LAUGHLAND



### CLUES ACROSS

- |   |  |
|---|--|
| 1 Bullhead (7, 5)                                     | 24 The three-spot (and many edible fish) end in this (3) |
| 10 Enemy (3)  | 25 As in bass (2)  |
| 11 Precious stone, O friend (4)                       | 27 -gibbon, minor, or trinidad; the duckweeds (5)        |
| 12 The loaches (9)                                    | 28 Breathe in (7)  |
| 14 Fairytale giant (4)                                | 31 Zulu regiment (of young devil fishes?) (4)            |
| 15 Trepan (7)   | 33 An ulcer (1, 4)                                       |
| 18 It sins (anagram) (6)                              | 35 Fossil fishes (12)                                    |
| 20 Indicates that which is in sight at a distance (6) |  |
| 22 Having little (4)                                  |  |

### CLUES DOWN

- |  |   |
|--|---|
| 1 Order of toothed carps (12)  | 17 Denoting presence (2)                          |
| 2 Mazes; in aquatics, the air-gulping anabantids (10)                    | 19 Any marine fish (3, 4)                         |
| 3 Newts (4)  | 21 Sound of the moonfish (2)                      |
| 4 King in France (3)   | 22 Fairy of the periwinkles (4)                   |
| 5 Rushes (6)   | 23 Spot on for the answer (2)                     |
| 6 Garden tool (3)  | 27 Nothing (4)                                    |
| 7 Centre of pupa (2)   | 29 Turn the tap (3)                               |
| 8 Mating begins for mother (2)   | 30 A penny from the muddled dairy for the boy (3) |
| 9 Two or more <i>Trichopaster trichopaster</i> <i>nanatransis</i> (4, 8) | 32 Mating begins without polish (3)               |
| 13 Lack of light (5)   | 34 The Spanish end of the mackerel (2)            |
| 15 Tail (3)  |   |
| 16 Gentlemen (4)   |   |

### PICK YOUR ANSWER

- The second of the two scientific names of a fish is technically known as its: (a) Common name. (b) Popular name. (c) Specific name. (d) Trivial name.
- The family Centrarchidae is native to: (a) East Africa. (b) North Africa. (c) South America. (d) West Africa.
- The classification of fishes is the work of the: (a) Morphologist. (b) Oecologist. (c) Phylogenetist. (d) Taxonomist.
- The aquatic plant *Hydrocotyle* is popularly known as: (a) Bridewort. (b) Butterwort. (c) Pennywort. (d) Pipewort.
- The generic name of the Madagascar lace plant (*Aponogeton fenestrata*) was formerly: (a) *Heteranthera*. (b) *Limnolia*. (c) *Oscivandru*. (d) *Zanichellia*.
- In the wild, *Helostoma temminckii* (the kissing gourami) attains a length of about: (a) 6 ins. (b) 12 ins. (c) 18 ins. (d) 24 ins.

(Solutions on page 114)

## Bulletin Review

### "The Fish Culturist"

The Pennsylvania Fish Culturists' Association meet at the Academy of Natural Sciences, Philadelphia, U.S.A., and their official magazine, which is now in its thirty-third year, is probably the oldest publication of its type in the world. Bulletin exchanges are handled by Mr. Wm. I. Laurence, who is also President of the Association; his address is 214, H. 29th St., Wilmington, Delaware, U.S.A. The June issue of the magazine, which is a printed production on good quality paper and is illustrated by line drawings and photographs, includes the usual club items and reports together with articles on Plankton, Hydra, and The Starfish (*Opelastrea scissura*). Contributors include Henry W. Fowler, who is Curator of Fishes at the Academy and Henry A. Nichols, F.A.I.

### "Portsmouth Magazine"

Editor Jack Errington deserves high praise for a bulletin that is absolutely packed with interesting and informative articles. The April issue of this magazine, which is the official organ of the Portsmouth Aquarists' Club, contains 28 pages of duplicated reading matter size about 6 ins. by 8 ins. enclosed by an attractive printed cover and advertising section. Mr. H. Sinclair, who is Curator of Southsea Aquarium, contributes an article on scientific nomenclature; he points out the advantages of the present system and tells of the descriptive method of naming animals and plants that was in use before Carl Linnaeus invented Binomial Nomenclature. Remarkable on the differences in the general trend of the hobby in the south and north of England, Mr. Raymond Yates (well-known contributor to this magazine) writes: "I think it is a great pity that northern and southern aquarists know so little of each other," and gives interesting details of fish-keeping in and around Manchester. An account of a visit to Copenhagen Aquarium describes the wonderful effects obtained by using black, white, indigo, red and primrose tinted rockwork; for instance, black mollies are shown in an aquarium with white rockwork. Other articles deal with spawning vitellus, algae, vivariums, and many other subjects dear to the hearts of aquarists. Bulletin Editors who wish to correspond should write to Mr. Errington at 10, Wimbledon Park Road, Southsea, Hants.

## Seaside Invitations

**Hastings:** Aquarists on holiday in the vicinity of Hastings are invited to attend meetings of the Hastings and St. Leonards Aquarist Society held on alternate Wednesdays at 7.30 p.m. in the Junior Library, Clarendon, Hastings. Next meeting 11th August.

**Ryde, Isle of Wight:** Aquarists on holiday in the Isle of Wight are invited to visit the aquarium at Puckpool Park, Ryde. All fishes and equipment for this display have been loaned by members of the Ryde Aquarist Society, and the aquarium is open every day, 9 a.m. to 8 p.m. with free admission.

## Secretary Changes

CHANGES of secretaries and addresses have been reported from the following societies:

**Banbury and District Aquaria Society** (Mr. R. A. Butler, 225, Warwick Road, Banbury, Oxon); **Exeter and District Aquarists' and Pondkeepers' Society** (Mr. A. W. Chapple, 185, Heath Barton, Whipton, Exeter); **Wembley and District Aquarium and Pool Association** (Mr. R. W. Smith, 41, Rosewood Avenue, Greenford, Middlesex); **West Middlesex Aquarists' Society** (Mrs. J. Shelford, 99, Syon Park Gardens, Isleworth, Middlesex. Phone: Hounslow 5067).

## Aquarist's Calendar

31st July-7th August: **Blackpool and Fylde Aquatic Society** fourth annual open show at the Victoria Street Congregational School Rooms, Blackpool.

3rd-4th August: **Leicester Aquarist**



## from AQUARISTS' SOCIETIES

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

A copy of *The Aquarist's Directory of Aquarium Societies* will be sent free to any reader on receipt of a stamped, self-addressed envelope.

**Society display in the Horticultural Marquee at the Abbey Park Show, Leicester.**

6th-7th August: **Hendon and District Aquatic Society** annual open single entry show at the Brotherhood Hall, Hendon, London N.W.9.

7th August: **Worcester and District Aquarist Society** exhibition at Worcester Horticultural Society's show at New Road, Worcester. Open all day.

8th-15th August: **North of Scotland Aquarist Society** annual show at the Y.M.C.A. Union Street, Aberdeen. Competition entries to Mr. T. McRobb, 20, Seamount Place, Aberdeen, Scotland.

13th-14th August: **Nelson Aquarium Society** annual show at Carr Road Baptist School, Nelson, Lancs.

19th-21st August: **Portsmouth Aquarists' Club** open show at the Royal Engineers Drill Hall, Portsmouth. Entry forms from show secretary Mr. G. Elverson, 24, Bertie Road, Southsea.

20th-21st August: **Enterprise Aquatic Society** seventh annual show at Frisky Park Barret.

20th-21st August: **Welsh National Aquarists' Society**, 3rd Annual Show at the Park Hotel, Park Place, Cardiff.

21st August: **Romford Aquarists' Society** annual open show of tropical fishes at the Lambourne Hall, Western Road, Romford. Schedules obtainable from show secretary Mr. A. C. Speller, 21, Cedar Road, Romford.

21st-22nd August: **Leyton Aquarium and Pond Society** annual show in conjunction with Leyton Borough Show at Coronation Gardens, Leyton. Details from secretary Mr. R. H. Hull, 190, Hainsault Road, Leytonstone, London, E.11. Closing date for entries 14th August.

25th-28th August: **Leicester Aquarist Society** annual show at St. Mark's School Room, Belgrave Road, Leicester.

26th-28th August: **Stockport and District Aquarist Society** annual show. Details from secretary Mrs. J. Pay, 23, Oakfield Avenue, Frieswood, Manchester 16.

26th-28th August: **Midland Aquarium and Pool Society** open show at the Minor Hall, Bingley Hall, Birmingham. Schedules and entry forms from show secretary Mr. C. D. Roe, Shirley Aquatics Ltd., Monkspath, Shirley, Nr. Birmingham. Closing date 9th August.

2nd-4th September: **Stoke Newington and District Aquaria Society** annual show at the Library Hall, Church Street, Stoke Newington. For entries write to Mr. E. G. Gatehouse, 115, Bourverie Road, London, N.16.

3rd-4th September: **Walthamstow and District Aquarists' Society** annual show. Details from show secretary Mr. J. Browning, 28, Sperling Road, Tottenham, London, N.17.

4th September: **High Wycombe and District Aquarist Society** show in conjunction with the High Wycombe and District Show. Details and schedules from show secretary Mr. R. Adkin, 7, East Drive, Tottenham, High Wycombe, Bucks.

9th-11th September: **Peterborough and District Aquarists' Society** annual open show at Boroughbury Church Hall, Russell Street, Peterborough. Entry forms and schedules from Mrs. Y. Stockdale, 2, Home Place, Eastgate, Peterborough. Closing date 9th August.

10th-11th September: **Bethnal Green Aquatic Society** fifth annual show, with six

open classes for club furnished aquaria. Venue: Men's Institute, Bethnal Green. Show schedules from Mr. W. A. Richardson, 16, Whitman House, Roman Road, London, E.2 (closing date 13th August).

10th-11th September: **Chingford and District Amateur Aquarists' Society** show. Details from secretary Mr. R. Macfadden, 46, Nevin Drive, Chingford, London, E.4.

11th-12th September: **Willesden and District Aquarists' Club** show as part of Willesden Borough Show.

17th September: **British Herpetological Society** (London Group) meeting, "Young Animals," 7 p.m. at the Linnean Society's Rooms, Burlington House, Piccadilly, London, W.1.

22nd-25th September: **Kettering and District Aquarist Society** annual open show at the Co-operative and Labour Institute, Kettering. Schedules and entry forms from show secretary Mr. S. D. Simons, 52, Church Street, Burton Latimer, Kettering, Northants.

30th September-2nd October: **Three Counties Aquaria Show** (22 open classes) at City of Oxford Town Hall, Oxford. Entry forms and schedules from show secretary Mr. V. H. Lewis, 21, Halliday Hill, Oxford. Closing date 20th August.

8th-9th October: **Altrincham Aquarist Association** first open show. Details from secretary Mr. D. Malam, Holly Bank, Grove Lane, Hale, Cheshire.

28th-30th October: **Gloucester and Cheltenham Aquarists' Society** third annual members' show at Empire Hall, Cheltenham.

**Banbury and District Aquaria Society** invite entries for their fifth annual show (open to radius of 25 miles). Schedules and entry forms from secretary Mr. R. A. Butler, 225, Warwick Road, Banbury, Oxon.

For your show—printed gummed labels of fish names and award labels for aquaria are available from *The Aquarist* at small cost.

## Crossword Solution

M	I	L	L	E	R	S	T	H	U	M	B
I	A	F	O	E	O	P	A	L			
C	O	B	I	T	I	D	A	E			U
R	Y	S	C								G
O	G	R	E	S	E	A	S	L	U	G	
C	I	N	S	I	S	T	O	O			
Y	O	N	D	E	R						P
P	O	T	A	S							L
R	H	F	Z	R							M
I	N	S	P	I	R	E					I
N	A	S	O	R	E	A	E				
I	C	H	T	H	Y	O	L	I	T	E	S

PICK YOUR ANSWER (Solution)

1 (d). 2 (b). 3 (d). 4 (c). 5 (c). 6 (b).

THE AQUARIST