

The AQUARIST AND PONDKEEPER

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Dr. MYRON GORDON
1899—1959



Photo:

New York Zoological Society

THE sudden, unexpected death of Dr. Myron Gordon on 12th March deprived the tropical-fish hobby, as well as the scientific world, of an outstanding aquarist and scientist. Dr. Gordon was the foremost fish geneticist, not only of to-day but of all time. He contributed more to our knowledge of what fishes inherit and how they do so than any other man. Fish fanciers, however, knew him best as the author of many articles that explained his scientific investigations—and those of other scientists, too—in popular terms. Many of these have appeared in *The Aquarist*. Myron Gordon was born in the city of Odessa

in what was then Imperial Russia. His parents brought him to the United States as a baby, and he grew up in the Harlem section of New York City. His lifelong interest in all living things, both plant and animal, manifested itself at an early age. For example, as a boy he kept pet fishes, at a time when there was but a handful of fanciers in the United States. In 1925 he graduated from Cornell University, and 4 years later he received his doctorate there. His thesis concerned the inheritance of colour patterns in the common platyfish and the role that these patterns play in the black-pigmented tumours which sometimes afflict platyfish-swordtail hybrids. This was to be the subject of many of his future investigations, and it was to bring him international fame among geneticists, ichthyologists, pigment-cell biologists and students of cancer.

For 6 years Dr. Gordon maintained a laboratory of fish genetics at Cornell. In 1939 he established a new one at the New York Aquarium, under the auspices of the New York Zoological Society. When the old Aquarium building at the Battery was closed in 1941, the Genetics Laboratory was moved to the American Museum of Natural History. From 1947 on, the principal financial support of the Laboratory, and of Dr. Gordon's work, was provided by the National Cancer Institute of the U.S. Public Health Service.

Dr. Gordon specialised in the platyfishes and swordtails, and few were the aspects of their existence that he failed to explore. Besides their genetics, he and his students investigated their anatomy, behaviour, embryology, hormones, diseases, ecology, evolution and classification. It was Dr. Gordon who made these fishes the aquatic counterpart of the laboratory

guinea pig and the white rat. He was, of course, an expert in the care of platyfishes and swordtails, and he passed on to amateur aquarists much professional advice. More than 150 popular articles of his have been published, mostly in aquarium magazines. In the course of his studies, he made nine collecting trips to Mexico and Central America to obtain both living and preserved specimens. As a result of these trips, he was able to introduce new fishes to the hobby, the variatus platy and the Montezumae swordtail, for example. In his Laboratory, colourful new varieties were developed, the most famous of which were the various black wag or wagtail platys and swordtails.

Dr. Gordon visited Britain several times, and in 1953, by arrangement with *The Aquarist*, he made a lecture tour here and met aquarists at Glasgow, Newcastle, Sheffield, Birmingham, Manchester and London.

In recognition of his activities, Dr. Gordon was appointed speaker at the Fourth Annual Alvin Seale Lectureship, sponsored by the San Francisco Aquarium Society, in January, 1956. Scientists have lost an invaluable fellow worker in the death of Dr. Myron Gordon. Aquarists have lost a notable friend.

James W. Atz,
New York Aquarium

The Editor and publishers of *The Aquarist* wish to extend deepest sympathy to Mrs. Evelyn Gordon and daughter in their sad loss, and to record on behalf of British aquarists the profound regret felt by them when the news of Dr. Gordon's death reached this country.

FRIENDS & FOES No. 76

Bladder Snails



Shells of bladder snails. Left to right: *Physa fontinalis*; *P. heterostropha*; *P. acuta*

Mollusca (continued)

GENUS: *Physa*, from Greek *physis*—a bladder.

SPECIES: *Fontinalis*, from Latin *font*—a spring, fountain. *Heterostropha*, from Greek *heteros*—different and Greek *strophos*—twisted. *Acuta*, from Latin *acutus*—sharp, pointed.

NONE of the bladder snails is a large snail. *Physa fontinalis* is about half an inch overall in height, *P. acuta* a little more and *P. heterostropha* equal to *acuta*. The diagrams show the shape of each species and should serve as a means of identification. All bladder snails are fond of moving water and could probably survive in aerated aquaria, where the aeration is sufficient to give them sufficient oxygen and keep the water gently flowing. Shells are fragile and if crushed the snails might form a source of live food for some fishes. Eggs are laid in flat, gelatinous capsules and fastened to plants or stones.

P. fontinalis has part of its mantle projected beyond its shell and curling back over it in a series of finger-like processes. The young have longer processes, like tails, which could be mistaken for parasitic worms at first glance.

Food consists largely of soft algae, and I have seen *Physa* snails recommended for inclusion in aquaria for this very purpose, to keep down excessive growths of algae. There is little doubt that they eat a proportion of the stuff, but I doubt whether any snail could perform this duty as well or as quickly as a razor blade!

C. E. C. Cole

The Garden Pond in May—by ASTILBES

THIS is the best month of the year to re-stock a pond, and for the newly constructed one it is an ideal time to introduce both water plants and fishes. The fear of sharp frosts will have passed and so there should be little to upset the fishes when they are put into the pond. If a pond is small there is almost sure to be rather violent changes of water temperature and some fishes are not too happy with this state of affairs. This is especially so if they have been purchased from a stock which has been recently brought into this country after having had warm treatment. Any fishes which have been kept under warm conditions should be brought gradually to a temperature similar to that of the pond. If this is not done it is asking for trouble, as the fungus will often attack a fish which is weakened by a sudden chill or other bad conditions.

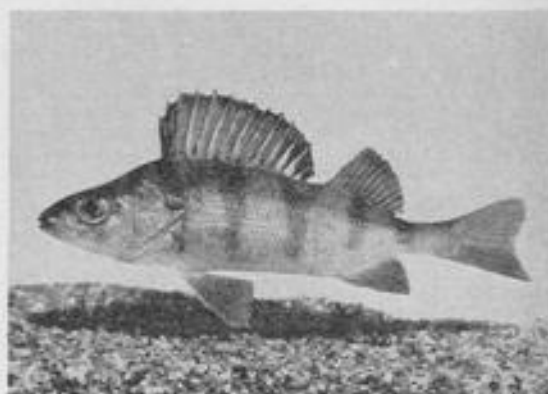
It is a great mistake to introduce any fishes to a newly constructed pond until the water has matured slightly and the water plants have made some fresh growth. I realise that this is advice which is rarely acted upon. Nearly everyone who makes a pond feels that it is imperative to stock it immediately. This is a bad fault as often the water plants have not started to grow and so they are unable to do one of their main tasks, that of assisting in keeping the water in a good condition. It must not be thought that the water plants are placed in a pond solely to oxygenate the water. The garden pond with its expanse of surface bears no resemblance to the restricted area of water surface of the average tank. In the latter case it is usual to see that some oxygenating plants are growing well before introducing fishes but the average outdoor pond could function quite well if there were no underwater oxygenating plants at all. However, the growing plants use up much of the waste matter in the pond such as the droppings of the fishes and also give cover for fishes.

Water lilies do not assist in the oxygenation of the water as their leaves are on the surface or above it at times, but their roots do a good job in helping to keep the water pure. Their leaves also give welcome shade for fishes in the summer. Although at times most fishes appear to like to bask in the sun, there are times when this can be too much for them and the shade of a few leaves is appreciated.

If it is desired to breed any fishes then the introduction of some underwater growing plants becomes a must. Most fishes which are usually kept in ponds prefer to spawn in plants. For controlled breeding plants should not be growing all over the pond, but a special bunch or two of them can be anchored at a shallow part of the pond. The eggs can then be taken out of these bunches and be hatched in a safe place.



Golden orfe are popular pond fish which are always active at the surface



Photos: W. J. Hayes

Perch—not a fish for the small garden pond



Tench are bottom-loving fish and will eat food reaching the bottom that other fishes ignore

During this month there is almost certain to be a fair amount of green algae form in the water. This is quite a natural proceeding as the water plants may not have grown sufficiently strong to choke out much of this growth. Meanwhile until the water gets a better balance of plants it does help to have a quantity of floating plants such as duckweed to make a temporary cover and give some shade. It is often the strong sunlight which encourages the growth of algae and so if the water can be shaded somewhat until the water-plants leaves grow stronger it will be found that the algae can be kept in check. Some pondkeepers put potassium permanganate in the water to kill algae, but this should not be overdone or the fishes and plants may suffer and the water can remain brown for some time.

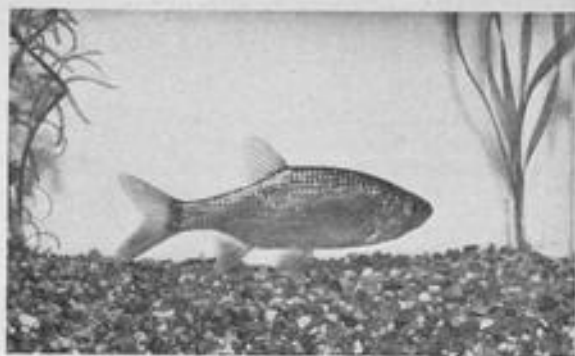
It was mentioned above that fishes should not be introduced into the pond until the water is mature. This may be difficult for a novice to determine, but pure water has a clear appearance, no bad smell and no colour or scum of any kind on the surface. Although water snails may not be of much value in a pond it will be found that if a few are included they will give a sure indication whether the water is pure enough for fishes or not. Where snails will live so will most fishes. *Daphnia* or water fleas can also be used, as

although these are often found in fairly foul ponds it is a fact that they soon die in water when there is insufficient oxygen or an excess of foul gases.

The types and numbers of fishes to be placed in the pond will be a matter of individual taste but there are a few important points to be borne in mind. Do not try to keep too many or too many different species in the pond. Be content to start with a few healthy fishes, say some kind of goldfish, and then when it can be seen that they are thriving some more can be added if necessary. Remember that in a pond which has a depth of 2 feet or more, some kinds of fishes are not likely to be seen a great deal and so it will be wise to consider first of all whether the fishes of your choice are entirely suitable.

Golden orfe are ideal for a pond as they are mostly surface swimmers, are very active and do well as long as the pond is not too small. In a small pond they would soon be in trouble if the water became foul or too warm, when it would lack oxygen. The common goldfish is also a fine pond fish as it shows up well and often spends a lot of time at or near the surface. Some of the fancy goldfish are also suitable; the shubunkin and the fantail are very good but the veiltail, moor, oranda, lionhead and celestial are not so safe as they may be upset in a bad winter. The moors would not be seen a lot in the pond and their protruding eyes could be damaged.

Golden rudd and golden carp can also be used but goldfish are to be preferred to the golden carp. Such fishes as gudgeon and tench will spend most of the time at the bottom of the pond. The golden tench is very handsome, and these fish will bask at the surface at times in warm weather. They are splendid as scavengers and so one or more tench should be included in every pond. Most of these fishes can breed in the pond provided that it is large enough and that there is enough cover among the water



Rudd can be kept in a pond, the golden form being the most suitable

plants for the eggs and fry to escape the dangers of being eaten by the parent fish. Bear this point in mind when stocking the pond; always allow for any increases from breeding. Do not be tempted to introduce a coldwater catfish into a pond unless it will be possible to catch it easily later on if it grows too big. Catfish are capable of growing to a large size and then they can eat fishes almost as big as themselves. Their mouths are about the largest part of them, and so a small goldfish would be swallowed up in no time. If you need scavengers then stick to the tench; this fish will not get dangerous to other fish even when it is very large.

Remember that the small garden pond is no place for pike and perch, as these fishes are carnivorous and will eat any fishes small enough for them to get into their mouths.

INTRODUCTION TO BREEDING

by MARIAN BRAUN

A FEW months ago I wrote to *The Aquarist* in defence of those who prefer to keep a community tank for its interest and decorative value. Now I find myself forced to join the elite.

It was not really my intention to go in for breeding at all. The news of my aquarium spread round the neighbours and reached the ears of some fellow-enthusiasts—both keen breeders. One, living in a block of flats opposite, introduced himself by offering me some blue gouramies. He had heard that I was a beginner and didn't keep many fish as yet. I accepted them gratefully but with a little inward trepidation. The 3-ft.-long tank looks attractive, to my eyes, well-planted and containing a moderate number of carefully chosen fishes.

The other enthusiast caused me some anxious moments. Three days in succession, a police sergeant bicycled slowly past, staring in the front windows. One day, off-duty, he knocked at the door and said shyly that he had heard that I had an aquarium. He invited us to see his collection.

Karl and I went round to his house that evening. He had three tanks in his front room and a conservatory at the back simply full of breeding tanks. We were impressed by a 2-foot-long aquarium planted mainly with *Hygrophila* and containing a shoal of tiger barbs which he had bred himself. Karl wanted to buy a small shoal of them, but I pointed out that this would spoil the effect of our aquarium of mostly penny-shaped fishes. The policeman laughed and said I

would have to start another tank. I did, too. . .

My very decorative aquarium of penny-shaped fishes has been in existence some time now, and the fishes are growing fast. The occupants at present are four dwarf gouramies, two pearl gouramies, four small angels, a *Corydoras julii* and two blue gouramies.

The trouble started with the last-named. Mr. Smith from the flats had given me two females. They matured and Karl discovered one evening that they were behaving in a strange manner—blowing little bubbles and piling them up on the surface near some floating *Vallisneria* leaves. I stood on a chair and gazed at them from above. Yes, they were females and both swollen with ova.

I called on Mr. Smith in distress. Those two poor female gouramies had become so frustrated, they were trying to build a bubble nest and getting quite excited about it. He came and looked at them and promptly offered to give me a pair of males. I tried to persuade him to exchange the two females for males but he insisted that it was a good opportunity for me to start breeding. I protested that I already had two decorative tanks—one community 36 in. long and one 24 in. long with a shoal of tiger barbs and attendant guppies—we had no room for more.

Eventually, I was given a male blue gourami in exchange for one of the females and Karl glazed another 24 in. tank.

When I brought him home, the gourami turned out to be

(Please turn to page 28)

Miller's Thumb—a Species worth Keeping

by WILLIAM J. HOWES

THE naturalists' name for the miller's thumb is the bullhead. There is only one species native to the British Isles, that is *Coetus gobio*, and it thrives best in clear running streams but will subsist quite well in other types of waters.

When fully grown a miller's thumb is about 3 inches long, and is seldom more than 4 inches in length, but a specimen of 6 inches has been recorded.

Miller's thumbs live on the river bed, as do gudgeon and loaches, much preferring a bottom of gravel or shingle, which they can effectively match with the colour of their backs, making it difficult for them to be seen by their natural enemies. In general colouring the fish is green, mottled with olive-green and black. This coloration is particularly striking.

The miller's thumb is so-called because of its blunted and flat head, which is supposed to give it some similarity to the thumb of the miller, which is said to be flattened at the end by continual testing of grain between thumb and forefinger. But this goes back to old-time milling practice.

The bullhead is an interesting little fish; its eyes protrude and are something like those of a frog. There is a small but strong spine of hard skin on each side of its head. The pectoral fins of the bullhead are large and rather fan-like, with spines to support the thinner membrane.

Normally the miller's thumb lives a solitary life, hiding

under large stones, but in the spawning season, any time between March and May, they associate in pairs. The female finds a hollow under a stone in which to lay her eggs and this is often referred to as a nest. Like the male stickleback, the male miller's thumb takes over and guards the eggs while the female goes off to resume her normal life.

The bullhead has no swim bladder, and this causes the fish to swim awkwardly when off the bottom, to which it sinks quickly enough when its efforts at swimming have exhausted it. The bottom of the aquarium can be covered by gravel and set with a few larger stones to make a natural and attractive setting. Sand is not advised as this quickly gets stirred up, and it might even choke the fish! Miller's thumbs certainly require artificial aeration. Yet their feeding presents no problem, for the fish will eat earthworms with avidity, also *Tubifex* worms, various insects and even the fry of its own species!

These fish can be caught without difficulty owing to their habit of resting under the large stones which are often to be found lying on the bed of fast-flowing streams. If a net is held down-stream of a stone which is sheltering a miller's thumb, with the free hand the fish can be coaxed towards the net and its capture is almost certain.

More Traders needed for P.T.A. Council

THERE should be a greater number of traders on the Council of the Pet Trade Association, in view of its growing membership. This was the view taken by members of the Council at their monthly meeting in London on 17th April, when the future development of the Association was under discussion. The Council is well represented by wholesalers, importers and manufacturers—but there are only two traders, both in the London area.

Pet-shop proprietors who are members of the Association are asked to contact the secretary if they are prepared to serve on the Council. Nominations will be considered at the annual general meeting, which is to be held in London on Tuesday, 26th May.

Mr. Kenneth G. Hayes, the president, said he considered it was vital, if the best interests of the trader were to be served, to have traders from various parts of the country as members of the Council. He appreciated that it might not always be possible for such Council members to attend every monthly meeting, but if they could be present only every 2 or 3 months, their contribution of thought and ideas could be invaluable.

Mr. Sam Jacobs, the chairman, said he thought that the Council was in complete agreement with this proposal and he would personally welcome a bigger Council altogether.

Mr. Eddie Snykala reported that a letter had been received from the British Standards Institute asking if a member of the Council would be prepared to serve on a committee which has been set up to consider the preparation of British Standard recommendations for the carriage by air of fishes, amphibians and invertebrates. In view of his experience in this field, it was agreed that Mr. Snykala be asked to represent the Association on the committee.

Traders who are members and are willing to be considered for service on the Council should write to Mr. F. C. Wright, Secretary, The Pet Trade Association, 88, Inderwick Road, Hornsey, London, N.8.

Aquarist on Television



Junior member of the Hendon Aquatic Society, John Chalmers, made an appearance on A.B.C. Television in a programme called "Hobbies". In this picture he is seen with Linda Green and Simon Kester, compères in the programme. John hopes to be a sound engineer and is at present attending Harrow High School

Breeding *Epiplatys chaperi*

by E. WALLWORK

TO many aquarists who are comparative beginners to the breeding of egg-laying fishes this little fish, fairly easy to obtain, will give good results and a good deal of pleasure. No really common name exists for this fish, which is often called *Panchax chaperi*. However, it is a most attractive fish if given the proper conditions. As with others of the panchax group, they are not too happy at the higher temperatures—75°F. is a happy medium.

Epiplatys chaperi is a shy fish which will live in a community tank; it is not always available on view and will stand still for quite long periods in one corner of the tank, although it can make a rapid dash for any food which sinks through the water. In this it imitates the pike, to which it bears a resemblance in having its dorsal fin set well back, just in front of the tail fin.

Sex in this fish can usually be identified quite early by the fact that the caudal fin in the female is rounded, whereas that of the male presents a flattened lower border. The anal fin of both fish also shows similar characteristics. As the fish mature, the distinction is more obvious and although the female still is only a pale amber with four pale brownish black bars in the rear half of the body the male is unmistakable. His bars are a darker colour and the flattened lower border of the anal and caudal fins are similarly a deep warm black. Under the lower jaw of the male is an orange-red flush extending down to below the gill plates, and this coloration is even more attractive when he is in breeding condition. The female is, of course, more distended as she attains sexual maturity, though lacking any distinctive fin markings. I have grown a good many males to 2½ in. long, and females to 2 in., though they will breed at ½ in. less than this.

My own experience is that these fish prefer to feed in mid-water or at the surface and do better on fresh animal food, more especially if it moves. They will occasionally eat dried food of good quality in small amounts. White worms, *Daphnia*, *Tubifex*, mussel, crab, pilchard, gnat larvae, earthworm and odd bits of liver, fish and lean meat have been used at various times of the year to condition the fish and, as I prefer it, in separate tanks.

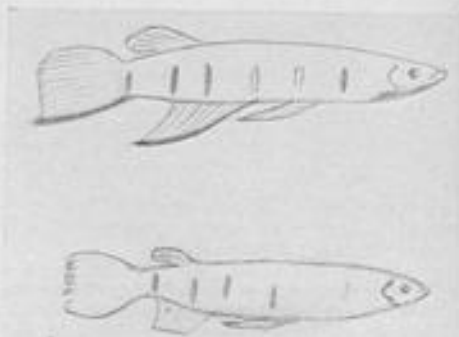
Breeding Tank

The breeding tank needs a reasonably large surface area rather than much depth and 18 in. by 10 in., 24 in. by 9 in. and 24 in. by 12 in. have been used at different times. Depth of water is not more than 8 in., but this is variable. Water is best taken from an old-established tank which will give the acidity required, about pH 6.8. Some aquarists advise the use of peat to produce this acidity but in my opinion it is difficult to estimate the amount required, so I siphon in finely divided mulm from my community tank.

Plants need not be an expensive item for this fish, nor very elaborate: a few *Vallisneria* or water wistaria in one corner of the tank and a good light blanket of bladderwort, teased out to a layer 2 to 3 in. thick at the surface. *Riccia* will do, or floating fern and even hornwort grown in tropical tanks, if closely packed. If you are impatient, as a good many aquarists are, to achieve rapid results, you can grow strands of this common coldwater plant (hornwort) under good top light as much as 3 in. per strand per day, in a tropical tank.

Temperature for breeding is raised to 76-78°F., and one adult pair introduced into a small tank, or two males to three females into a larger tank. Snails and their spawn are carefully excluded.

At this time you will see the true beauty of the male, but



Outlines of male (top) and female (bottom) *Epiplatys chaperi*

this is no rapid courtship which can be quickly described. In fact I have continued to feed white worms, which they will eat, but only if it falls through the water, as these fish seem averse to going to the bottom to feed. Over a period of a week or so the male will carefully nudge the female obliquely into the bladderwort, and then, by rapid wriggling, assume a position just above. At this moment both fish tremble a little and one or two eggs are laid on the plants. After that the male leaves in search of another female, returning at intervals to repeat the process with each female.

Eggs and Fry

The eggs are about 0.75 mm. diameter, opaque and mottled greenish-brown and look like miniature peppercorns on the plants. At the end of a week spawning should be over and I prefer to push the floating plants to one side and remove the parent fish, though I have on occasions removed the cover plants to another tank. Incubation period of these eggs is rather long, being about 12 days.

At the end of the second week, or a little before, I look for the fry at the surface of the water. Those from the early spawnings are about 4 mm. long, pale and with bright shiny golden eyes, and I prefer to collect them with a dessert spoon and transfer them to a shallow floating pie dish containing water from the same tank and maintained at the same temperature. As I use a dessert spoon, I previously have excluded any duckweed, under which these fry could hide to avoid capture. In this small dish it is comparatively easy to feed and also to count the batch. Infusoria are not required for these fry and they will take micro worm, brine shrimp and rotifers almost immediately.

In a batch of mixed size such as this, some of the fish are said to eat their younger brothers, but I have not found this to be so if they are all well fed. At the end of the fourth week from the commencement of spawning the batch will range from 12 mm. to 4 mm. long and, graded accordingly, are moved into a medium-sized tank of 6-8 in. water depth. Food, especially animal food, soon produces sound fish and, though we are told that 120 fry may be obtained, I have averaged 75 fry with two males to three females in a tank of 18 in by 10 in. surface area. The fry can, of course, be left in the original bladderwort to feed, but it is my opinion that food which gets through is wasted as the fry will not go far down. In a shallow dish they can feed on the bottom.

Some Fishes from South-East Asia

by JOHN S. VINDEN

SOUTH-EAST Asia is the home of many beautiful and popular aquarium fishes and, in all probability, we shall see new species arriving in the not-too-distant future, since collectors have recently been very active in Siam and the surrounding areas.

Many of our old favourites come from this geographical region, but it also provides us with some of the rarer and more spectacular fishes that are coveted by most aquarists. Most species of fishes from this area differ in one important respect from the ordinary run of tropicals as they are "wild" fishes as opposed to those that have been bred in captivity. This does not apply to such domesticated fishes as Siamese fighters and some of the barbets, but many of the others are unused to aquarium conditions when first imported.

For this reason these fishes should be bought only from reputable dealers who quarantine them before offering them for sale. This period of quiet enables the fish to settle down and, also, any mortality that occurs either through disease or injury occasioned through rough transport is a loss suffered by the dealer. Fishes from such a source are obviously going to be more expensive, for fish dealers must cover their losses like any other trader, but, even so, a fish that is healthy is worth considerably more than one at a bargain price that may die within a few days.

As far as one can generalise about aquarium conditions for this geographical group it is safe to say that for the most part they prefer clear, old, acid water, well-planted tanks and temperatures higher rather than lower than the average of 75°F. This does not apply to some of the mountain-stream fishes, which can tolerate somewhat lower temperatures.

Planting the tank is a matter of taste although plants from the same geographical area are, obviously, more natural to the fishes and they provide a more interesting background. Whereas the owner of a single tank may furnish it with plants from all over the tropics, one so often sees fish houses and public aquaria in which all the tanks are planted in a similar manner. It is more interesting to the spectator, and more natural to the fishes, if plants and fishes with the same natural habitat are housed together. After all, no zoo would give polar bears a scenic background of palm trees, or lions one of icebergs!

When considering Asiatic plants one thinks automatically of the *Cryptocoryne*, and while it may take a long time to grow enough to produce a heavily planted tank, the result is well worth while, since there is now such a number of species available that picturesque planting is easy to carry out. Some years ago the aquarist had to be content with some four or five species, but now there are five times that number, and they range in size from the tiny *C. nevilli* to the large species such as *C. griffithi*, which make such handsome centre plants. The giant Siamese hygrophila *Hygrophila stricta* is also a suitable plant for fishes from this region and, if snails are required, the obvious choice would be the Malayan mud snail *Melanoides tuberculata*.

It is impossible to list or describe all the suitable fishes from this region, although certain species stand out for one reason or another, either because they are beautiful well-established favourites, or because they make outstanding aquarium exhibits.

One of the latter is the flying fox *Epalzeorhynchus hallopterus*. It is a very active and handsome fish with a black-and-gold stripe running the full length of its bluish body; its dorsal is marked with black. Points in its favour are that it will eat anything, including soft algae, and



Photo:

Laurence E. Perkins

One of the most popular and handsome of the genus *Rasbora* is the harlequin fish (*Rasbora heteromorpha*)

scavenges to a fair extent; it is normally peaceful, long-lived and does not grow too big for the normal tank. Another species, *E. namensis*, is sometimes offered. It is similar to the flying fox, but the dorsal is colourless and the body stripe does not extend into the caudal fin. This species has two barbels on the upper lip and the flying fox has, in addition, two more on the lower lip.

There are three other species in this genus and it is possible that they may sometimes be imported as flying foxes since the differences between them are very slight. These desirable fishes are not always available since imports are seasonal, and demand usually exceeds supply. The disappointed aquarists will gain little consolation when they learn that these fishes, small though they are, form the basis of certain Siamese dishes, as do several of the *Rasbora* species!

One of the most beautiful of all aquarium fishes is the Sumatran clown loach, *Botia macracantha*. This is one of those fishes that prefers a temperature of around 80°F. and if suddenly chilled is so weakened that it easily falls prey to disease. At a suitable temperature, however, it remains in perfect health for years and is not only ornamental but is useful as well, since it spends its nights scavenging around the bottom of the tank. Although it will eat most foods, it appreciates an occasional meal of such food as white worms, which should be dropped into the tank last thing at night after the other fishes have ceased feeding for the day.

There are many other desirable Asiatic loaches, but few of them, with the exception of the popular kuhli, are on sale as frequently as the handsome clown. *Botia hymenophysa*, which is very common in S. E. Asia, is an interesting and attractive fish which has caused some confusion in the past

since its colour and patterns change with age. This led some observers to believe that they were dealing with different species. Its basic colours are black and yellow but it is very unlike its cousin the clown loach though its requirements are similar.

Other scavenging fishes that are distinctive to this region are the black shark *Morulus chrysocephalus* and the red-tailed shark *Labeo bicolor*. Both are gentle long-lived aquarium fishes, and the red-tailed shark is more desirable in some ways since it does not reach such a large size as the black shark and because of its unique coloration. When in condition the fish is jet black with the exception of the tail, which is bright geranium red. The pectoral fins sometimes show traces of red under some conditions.

In Siam there is a counterpart to the sucker catfish of South America. This algae-eater, *Gyrinocheilus aymonieri*, is not a catfish but it has a sucker by its mouth and spends much of its time cleaning the plants and sides of the aquarium.

As far as I am aware, none of the fishes so far mentioned has been bred on a commercial scale, and few of them have been bred at all, but there is another group of fishes from the same area which can be profitably bred by the experienced aquarist. These fishes, the rasboras, offer a wide range of distinctive and beautiful aquarium fishes, all of which are gentle and easy to keep. Many of them are bred in commercial quantities by continental aquarists.

Both cheap and common, the harlequin fish *Rasbora*

heteromorpha is one of the most handsome and popular of the genus. No other fish can be mistaken for it and it can be bred, although not many British aquarists have mastered the technique. For success one needs clean old water with temperatures of around 80°F. and a supply of broad-leaved plants such as the larger *Cryptocoryne*. As a rule spawnings are not large.

Among the less-common rasboras may be mentioned the red-striped rasbora *R. pauciperforata*, at one time known as *R. leptosoma*. This is a pretty, slender fish with a red stripe running along its body. They have been spawned in tanks of soft peaty water in which plenty of *Cryptocoryne* were planted. Small tanks are quite suitable and spawnings, when successful, are large.

A comparative newcomer of great merit is *R. borapetensis*. This fish seems to combine the coloration of the white-cloud mountain minnow and the Belgian flag tetra. It is quiet, peaceable and has been bred.

Other pretty rasboras are *R. dorsicellata*, with its green eye and black-marked dorsal, the queen rasbora *R. hengeli*, the distinctive scissor tail *R. trilineata* and the delightful dwarf spotted rasbora *R. maculata*. Though too small for the ordinary community tank, this tiny creature deserves a small tank to itself. Small food must be offered for even the adults will eat micro worm with relish.

Space does not permit any description of the labyrinth fishes that abound in S. E. Asia, but it is hoped to deal with this fascinating group in a future article.

Introduction to Breeding

(continued from page 24)

a good bit smaller than his sister as he had been kept in a more stocked aquarium. Mr. Smith did quite a lot of breeding and had not as much space to spare as I had. I felt some uneasiness at putting the small male with the larger, frustrated female, so Mr. Smith suggested letting them be introduced in the community tank and get acquainted for a few weeks before segregating them for breeding.

The glass jar containing the new male gourami was floated in the tank until the temperatures equalised. I did this in the evening, after putting the light out, as dwarf gouramis are shy little fish and mine are just beginning to feel secure, so I did not want them unduly alarmed. Half-an-hour later, I liberated the new gourami in the tank, the other fishes hardly seeming aware of the stranger.

The next morning, I switched on the light and fed the fishes. I feed them first from one side, then from the other. The more forthcoming fishes rush upwards as I put the food on the first side but the shyer ones hold back, so I scatter food on the other side for them. I was pleased to see the new blue gourami rush forward. The other fishes took no particular notice of the stranger—except for the female blue gourami, who greeted him with pleasure, stroking him with her 'feelers.' He seemed a little coy at her attentions.

When I came back in the evening, I was surprised to see that the female blue gourami obviously had no maidenly modesty. She had decoyed him to the site of her attempt at a bubble nest and was eagerly blowing bubbles, though he looked a little unwilling. I thought I had better put them in their spawning tank, but Mr. Smith decided it was too early. The next day, before I went to work, the bubble nest was gaining in size and the male seemed to have taken over the construction. The female, having succeeded in interesting him in it, was pretending she didn't know what it was all about.

When I returned in the evening, Karl told me disappointedly that they no longer seemed interested in each

other. The female was swimming around with the other fishes and the male stayed up by the bubble nest.

Possibly owing to the dense foliage (I like plants just as much as fishes), we realised nothing until there were strange-shaped little fish swimming around quite boldly as they were just too big to be eaten. There weren't very many, of course; the lack of cultured microscopic food and the attentions of the other fishes had made sure of that.

I transferred as many as I could catch to the spare tank. To my surprise, there were 15 of them. I fed them well until they were a decent size and then sold them to a nearby dealer—who has told me that he would be glad of any more young bubble-nesters I can let him have.

When I started keeping an aquarium, my idea was to have an animated waterscape to decorate the room, but it certainly gives one a great sense of achievement to breed fish—even though accidentally—and I can't wait to find out if I can succeed with intentional breeding now.

Cacti in the Fish House

MOST cactus plants will benefit from a repotting at this time of the year. As the plants should be in active growth they will soon get over any move and make fresh fibrous roots very quickly. All young plants can be repotted each year and the slower-growing more mature plants can have a move once every 2 or 3 years according to their rate of growth. Cacti need the same fertilisers, etc., as most other plants, and can soon absorb all the soluble nourishment in the soil of a medium-sized pot. When plants fail to grow and flower it is probable that the soil has become impoverished and needs changing. Always use clean pots and no larger than is necessary. The soil can be John Innes potting compost no. 1, to which has been added a sixth part of very sharp sand, such as washed river grit. Remove the plant from the pot and clean off all old soil. Plant to the old level, do not ram too tight and see that a large crock is placed over the drainage hole first to make removal easier another time.

Microscopy for the Aquarist—48 by C. E. C. COLE

I WONDER how many of you proceeded with the examination of the snails' teeth I told you about in the previous article of this series. Those of you who did, no doubt had their appetites whetted for further experiment and practical work. There is much that you can do on your own account and you will learn a lot in the process provided that you make notes of what you do—and the results. Not everything will be a success; even now I have many failures and I am learning all the time. Without notes, however, memory plays many tricks, particularly if effort is spasmodic and made at long intervals.

"Operation Fish Lice," which I am at present carrying out, has already lasted several months, and it may be 12 months more before it is completed! Nature has its own rhythm, and will not change it to suit individual investigators. Where notes are made, they can be referred to and the observations taken up at any time. Reliance upon memory would be the poorest sort of truth-seeking. So put it down in black and white—constantly and always. Keep a diary of events—dates are important!

I have mentioned fish lice (*Argulus*), so let's have a look at them. If my experience is general, specimens are easy to obtain. Visit any angling area and catch any wild freshwater fish. The chance that your catch will be carrying several lice is very great—far more than the chance they will be free from them. Harmonising as they do with the body colour of the fishes it may need more than a casual scrutiny to find them. They may be on any part of the body or fins or head, but they give away their presence when the fish is held in the hand or the net out of water by moving away to seek water. They are easy to remove, once they release hold with their suckers, if the fish is suddenly immersed in a dish of water. This swirls under the lice and lifts them free of the fish. Once the lice have been obtained, please make sure the fish is quite free from them before slipping it back into the water.

The lice so removed will not live for more than a day or two away from their host—particularly if they have come from moving water and are placed in a small still-water container. But a day or two is all we require if the sole object of obtaining them was for slide-making.

At first it may appear that the creatures could be mounted on a flat slide, they look so thin. But actually they have too much depth to permit this to be done without considerable difficulty, so choose a cavity slide.

They are not so thick as even the smallest beetles of course, and so there is no necessity to do much about softening them. A day or two in 5 per cent. caustic potash solution may help a little, followed by a thorough washing in distilled water and immersion in acetic acid for a day or so. They are then soft enough and can be further processed.

The chitin with which they are covered is fairly well coloured, but may be stained yellow with the help of Bouin's fluid. They can be left, if desired, for some days in this solution without over-staining taking place.

Follow the usual dehydrating procedure of immersion in alcohol solutions up to 90 per cent., then transfer to Euparal Essence and mount in Euparal.

Owing to the comparative thickness of the lice, and the many tiny air pockets which can cause trouble in the mountant, do not hurry over the final stages. A little mountant is placed at the bottom of the cavity first, then the prepared specimen allowed to sink by its own weight into it and is followed by a little more run in from the sides, not dropped from above; this is the best order to follow. Then cover the slide with a raised tin lid to prevent the ingress of dirt, and leave it for several hours before adding



Appearance of the head and part of the suckers of male (right) and female (left) *Argulus*, examined with $\frac{1}{4}$ in. objective and $\times 8$ eyepiece



Eggs of *Argulus* seen under the microscope

more mountant. Only then should the cover slip be lowered gently—ever so gently—into position. Ring the slip in the normal manner once the cover slip has settled into place and no air bubbles are showing under it. If there are air bubbles present lever off the slip and start again. This is often tedious and frustrating, but when successfully accomplished the satisfaction one feels is intense.

We can now examine details of the louse or lice whenever we feel sufficiently interested, with low- or high-powered lenses, and add considerably to our knowledge of the details of structure of this interesting little crustacean. I'm more than half inclined to say that the interest of fishkeeping is outweighed by the interest to be derived from the examination and study of all the other aquatic creatures.

I may be branded as a heretic, but believe me when I say that my interest in fishkeeping is sincere—for without fishes there would be no fish pests—without hosts there could be no guests. The habits of the hosts are known—the habits of many of the guests only partially so, and who can tell how good a friend or how bad an enemy a particular creature is without full investigation?

DO YOU KNOW THE NAMES?

The vowels of generic names of plants are given horizontally in the squares. Fill in the consonants from the jumbled list below to complete the names. One of the down columns will give the generic name of a well-known aquarium plant.

B C C C D D G H L L L L L L N N N P R R R R R S S S S T T V W Y Y



(Solution on page 28)

The Butterfly Cichlid

by DIANE SCHOFIELD

WHEN the word cichlid is mentioned, almost automatically there flashes into the mind a mental picture of a big colourless, ugly, plant-eating fish. Although these adjectives certainly apply to the majority of the family Cichlidae, it can by no means apply to that dainty branch which comprises the dwarf cichlids. As far as colour goes, most of them have no peer in the world of tropical fishes. This is especially true when they are in mating colours. Of all the dwarfs, *Apistogramma ramirezi* is among those with the greatest array of colours taken from the rainbow.

There can be no quarrel with its nickname "butterfly cichlid." Many a butterfly would covet the colours of *A. ramirezi*. An exact description of the coloration is hard to give as changing light gives their colours a new perspective. Basically the overlying colour is an iridescent sheen of blues, lavenders and greens. Extending from the dorsal fin to the lateral line there are from five to six dark bands, giving emphasis to the colours. The gill covers are suffused with streaks of turquoise blue, and bright orange-red edges the large saddle-shaped dorsal fin. A further accent is given in the black line which runs through the metallic-red eyes. They have a reddish orange nose which becomes even more so when they are in mating colours.

Sex may sometimes be determined by the first two rays of the dorsal fin, which are longer in the male; however, females also seem sometimes to develop longer rays so this is not a fool-proof method. These two rays are a blackish blue. The pectoral, caudal and anal fins are dotted with blue and lavender polka-dots. Oddly enough it is the female who outshines her male counterpart at spawning time. Over her belly there appears a reddish rose blush and between her anal and ventral fins a reddish purple spot appears.

Maintenance

A. ramirezi has not been known to aquarists for as many years as have some of the other dwarf cichlids. Its popularity has spread far and wide, however, since its discovery by Mr. Manuel Vicente Ramirez and Mr. H. Blass. They were discovered in the llanos of Palenque in Venezuela, where a great many of our well-known tropical fishes have their source of origin in shady, tree-hung streams, and where the water runs brown with decayed vegetation. *A. ramirezi* lives in rivers which flow through grassy plains and where there is little shade. Since the water is exposed to the sun, it follows that the fish prosper in water that is of a higher temperature. This holds true not only for spawning times but for their day-to-day living as well. A temperature of 76° to 85°F. should be maintained. Although the streams which flow through the llanos of Venezuela are soft and acid, *A. ramirezi* can be acclimated to a more hard and alkaline water if the transition is done gradually.

To spawn *A. ramirezi* one should buy a minimum of six young fish. Sexing is a difficult procedure, but the fish will in time pick their own mates. As do most other cichlids, they mate for life. A 5-gallon tank is sufficient for each mated pair. They should reign in solitary splendour in this tank, without even so much as a catfish or a snail to keep them company. *A. ramirezi* are skittish, shy fish, particularly at spawning time. It takes very little provocation on anyone's part for them to eat their eggs. Apparently in their native habitat the spawning months are between January and May; however, if the temperature is kept around 80° to 85°F., spawnings should take place almost every 2 to 3 weeks. The fish will spawn in water that is on

the alkaline as well as on the acid side of the pH scale, the only difference being a greater disposition of the eggs to develop fungus in alkaline water.

They prefer a smooth, clean surface as a receptacle for the spawn. Smooth, river-worn stones or slate do very well. There is the same general house-cleaning, before spawning, that their larger cousins employ. Then the eggs are deposited in a circular area by the female with the male following close behind to fertilise them. The eggs are a creamy orange and are much larger than would be expected from the size of the fish. The breeding tube of the female is slightly bent forward. Both male and female tubes are 3/16 in. long and 1/16 in. wide. Although a smooth rock is preferred, sometimes the spawning is done in a pit dug in the sand. This is undoubtedly done to thwart any attempts on the part of the aquarist to hatch the eggs artificially! Unless the fish are left in complete isolation, any distraction will cause one or both of the parents to devour the eggs. Even when they are left alone, an altercation between the brood fish may terminate in a feast of the roe. Sometimes the female should be removed after spawning to prevent subsequent bickering and eating of the eggs. The male is quite capable of tending the eggs and fry alone.

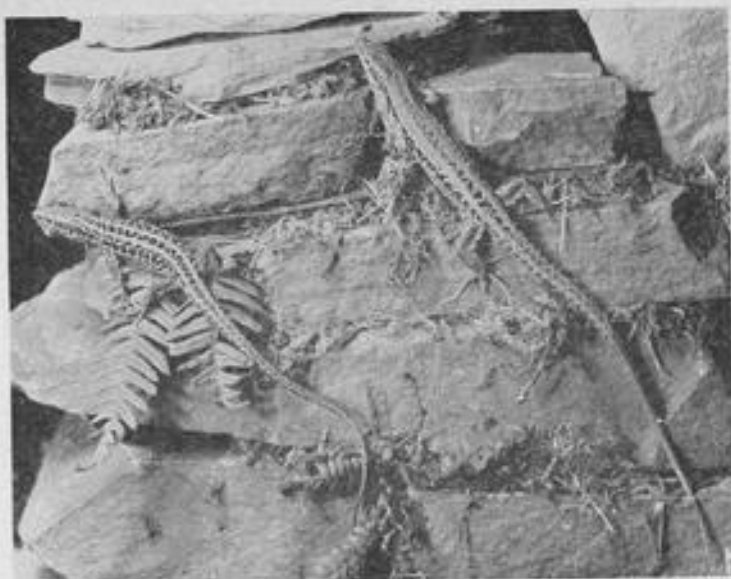
Breeding

If the aquarist desires to raise large numbers of the small *A. ramirezi* he should try if possible to hatch the eggs artificially. A high temperature is required for breeding and it is even more important for hatching the fry. At least 85°F. should be maintained for hatching of the eggs in 48 hours. If the temperature is allowed to drop, hatching will take another 24 hours. A medium air stream should play on the eggs. If eggs affected by fungus are blown off, they should be removed by the use of a large eyedropper or tweezers. This prevents the contamination of the good eggs, just as removal of a bad apple prevents contamination of good ones. The newly hatched fry are very susceptible to any pollution of the water.

The babies, once hatched, lay in quivering little groups for from 3 to 4 days. At the end of this time the egg sacs are absorbed and the free-swimming stage begins. Although the eggs are large, the fry are small enough to need Infusoria for the better part of a week until their mouths are large enough to accommodate newly hatched brine shrimp and micro worms. As *A. ramirezi*, both large and small, are largely carnivorous, their diet should include a greater portion of live foods than dry. They will usually eat dry foods but they neither relish nor thrive on too large a proportion of them. The small *A. ramirezi*, once hatched, are relatively hardy if kept on such a diet.

Their brilliant colours would make them a definite asset to any community tank; however, they have two drawbacks. One is their extreme shyness. If put with other fishes they usually stake out some small nook or cranny and dart out only at meal times. The other is their high temperature requirements. Fishes that might share this atmosphere are *Otocinclus*, *Pyrrhulina* and *Hyphessobrycon serpae*. These fishes also come from the grassy llanos of Argentina. *A. ramirezi* are not aggressive fish, as are many of their relatives. Their scrimmages are confined largely to their mates at spawning time. They do not fin-nip or eat plants.

If the aquarist has a small tank that he would like to devote to the care and rearing of *A. ramirezi*, he will be fully compensated in viewing their lovely metallic, kaleidoscopic colours.



Photos:

Robert Bustard

Wall lizards (*Lacerta muralis*) are excellent climbers and a wall such as that illustrated should be present at the back of their vivarium or in the reptiliary

Hardy Lizards—by ROBERT BUSTARD

BY the month of April all the British lizards have emerged from hibernation and can be seen, on good days, lying basking in the sun. The mating season for the slow-worm (*Anguis fragilis*) and the common lizard (*Lacerta vivipara*), which have been active for about a month now, has commenced and May is an ideal time to add these specimens to the collection.

Imports of the hardier European lizards are arriving by May and it is warm enough to allow such species as the wall lizard (*Lacerta muralis*) and the green lizard (*Lacerta viridis*) to go straight into the outdoor reptiliary.

British Lizards

Let us take the British species first, all of which are ideal for the beginner because they are easily kept and can be caught or purchased very cheaply. Slow-worms can often be found hiding under flat stones. If a lizard is frightened and evades capture it is a good plan to remain still—it will often return to bask in the same spot after a few minutes.

The slow-worm is easily kept in a simple vivarium, which can be of wood with a glass front. A layer of soil (3 in.) is placed in the foot, moss is set on top of part of this and a large flat stone or slab of bark is placed in a corner of the vivarium. A small water dish is added and an area of hard-pressed bare soil is left for feeding. A suitable size of vivarium for a pair of slow-worms is about 24 in. by 12 in. by 12 in.

When the slow-worms are introduced they will soon construct a few tunnels in the soil leading to their hide-out under the stone. If the vivarium is placed in the sun they will come out and bask. The best time to feed them is in the evening and food is simply dropped in front of them. Suitable food is small earthworms, or slugs, the white variety being much preferred. Soon the slow-worms will feed in the presence of the owner. They are interesting to

watch as they approach their prey, and then come down on it deliberately from above. Slow-worms are ideal subjects for the outdoor reptiliary, and specimens in the collection often give birth to their young, which number usually from six to 12. The care of baby reptiles will be discussed in a future article during the summer when the subject is topical.

The slow-worm, sometimes known as the blind-worm (it is neither blind nor slow), is a legless lizard. Although its appearance is somewhat snake-like it shows the usual lizard characteristics (not found in snakes) including the ear opening to the exterior and movable eye-lids. The coloration is very variable. Adult specimens reach about 15 in. Price varies from 2s. 6d. to 4s., depending on size.

The other two species of British lizards are of the characteristic lizard form and possess four legs, which are well developed. The common lizard, like the slow-worm, is widely distributed and produces living young, i.e., it is (ovoviviparous). Adults measure about 6 in. The coloration of this attractive little creature is very variable, being brown with black markings above. A dark vertebral line is usually present. Below, the female is yellow or pale orange whereas the male is bright orange or reddish. The base of the tail is thicker in male specimens and this, apart from the colour, is a simple way of sexing members of the Lacertidae. This species can be purchased for 2s. 6d.

If the common lizard is housed indoors it must have its vivarium placed in the sun each day for as long as possible. Specimens in nature bask in the sun from early morning to late evening. The vivarium (of similar size to that for the slow-worm) should have a few inches of sand on the floor and flat stones should be arranged at the back and sides to provide hiding places and basking sites. Some dry moss can be added if desired. A small water dish should be



Shortly after this photograph of these sand lizards (*Lacerta agilis*) was taken the female (left) laid nine eggs

present at all times for all these lizards. This arrangement is also suitable for the sand lizard (*Lacerta agilis*) and the wall lizard (*Lacerta muralis*) described below. The vivarium size mentioned above is suitable for only between two and four specimens and should be larger if possible.

Food for these lizards can be any live insects. The main stand-by of the collector are gentles, bluebottles and mealworms, but non-hairy caterpillars, small moths and butterflies will also be eaten. Spiders are very readily accepted and are a good item to tame them with as they will quickly learn to take them from the fingers. It is most important to provide variety in diet, as, like all creatures, they soon tire of a monotonous diet.

European Lizards

The sand lizard and the wall lizard are both oviparous; in fact the common lizard is the only member of the genus *Lacerta* to produce live young. Wall lizards may produce several clutches of eggs in the course of the year. The hatching of the eggs and rearing of the young has been discussed at length in the current issue of the *British Journal of Herpetology* (vol. 2, no. 7: December, 1958).

The sand lizard lays between six and 12 eggs in one clutch each year. Both of these lizards measure about 8 in. when adult. The male sand lizard is grey-brown above with sides and underparts bright green. This colour is intensified in the breeding season. The female is greyish-brown above with deep-brown markings which have a white spot in the centre. The underside of the female is cream. The sand lizard costs between 2s. 6d. and 5s.

The typical coloration of the wall lizard is green and black above. The green is frequently restricted largely to the central area of the back, and towards the sides black markings cover much of the skin. On the flanks brown markings may also be present. The underside is creamy white. The wall lizard is an exceptionally active species and a good climber. Like the other species described it is suitable for either the indoor vivarium or the outdoor reptiliary. Wall lizards cost about 2s. 6d. to 3s. 6d.

Most lizards are able to break off their tail if this is grasped suddenly and the four species described are no exceptions. This trait often enables them to escape with their lives if an enemy grasps them by the tail. The broken tail fragment writhes around for a few minutes and thus diverts the attention of the pursuer from the escaping lizard. The break is caused by sudden muscular contraction and is a form of autotomy.

Lizards, when they become tame, are much less likely to part with their tail. Specimens which have lost most or part of the tail regrow the lost portion but this is not so long nor as well formed as the original tail.

Collector in South America

A MEMBER of the staff at Paignton Zoo has recently left for South America on a collection trip of tropical fishes and reptiles.

Mr. Veerasawmy will make his base camp at Georgetown and will then operate on the Brazilian and Venezuelan borders and the Orinoco River, where he will have to rely a good deal on the natives and their intimate knowledge of the habits of the reptiles and fishes he is seeking.

Mr. Veerasawmy hopes to bring back some large boa constrictors, anacondas, the venomous coral snakes, fer-de-lance and mountain rattle snakes. The reptiles will include iguanas, strong-jawed Teguxin lizards, dainty Ameiva lizards and red-headed tortoises. The tropical fish collection will include the leaf fish, man-eating piranha and electric eels.

Quite a number of tropical fishes were taken from the Paignton Zoo Aquarium in a specially constructed crate with all modern conveniences as an exchange for South American fishes.

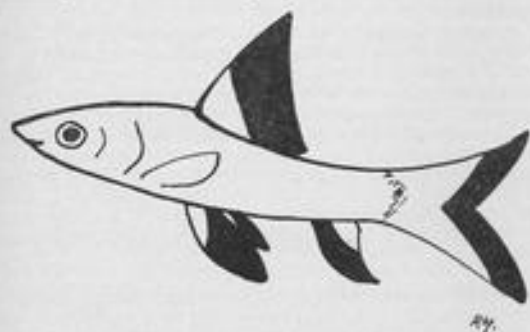
AQUARIST'S Notebook



by
RAYMOND YATES

NOT long ago I called in one afternoon on a dealer whom I visit but rarely, for a good general browse-round and with the ever-present hope that I might find something out of the ordinary. I certainly did. In the very first tank I came to were a pair of the new silver sharks, and although they were "pricey," I knew I should be taking them home with me. I continued to browse amidst the other tanks when, to my horror, I saw the dealer fishing out one of "my" sharks. My feelings for the customer concerned can be well imagined but there was nothing I could do about it except snap up the other. This fish is certain to become very popular if obtainable in any numbers as it has all the points (or nearly all) which endear fishes to aquarists.

In the first place it is not a shark, of course, nor does it resemble the now well-known black shark or *Labeo bicolor*. At first glance one might see some faint resemblance but the fish is much more slender than these other fish and it is some time before one realises that it is more like the "pal" fish, *Epalzeorhynchus kallopterus*. Silver sharks have the same nervous dither of pal fish, and also can be amazingly fast swimmers. They have a peculiar habit of lying or swimming on occasion at an angle of 45 degrees laterally, and are almost always on the move. The fins are abnormally long and are held out stiff and erect, giving a very graceful effect. These fish are not choosy and seem to eat anything you offer, and seem to be on the look-out for food the whole time. They eat at the surface, on the bottom, in the middle reaches, off the leaves and glass—in short, anything goes.



"Silver shark" (approx. life size)

I was doubtful of putting my new specimen in with a community collection of fishes which included a large *Labeo bicolor*, as I feared that this might chase the newcomer; but I need not have worried. The black shark ignored the silver shark completely, which confirmed my opinion that this new arrival is no "shark." It is worth mentioning that they are not easily scared, and when another fish makes a "pass" at them, they merely "side-step" in the water and return to their original position. Quite obviously they do not bother other fishes and are therefore ideal for mixed collections. My tank temperature of 76°F. seems satisfactory and I have noticed that they seem unworried by conditions which *Labeo bicolor* dislike, such as cloudy water.

The overall colour is sheer silver, "silver tetra" silver, but the fins have a strong yellowish tinge. The eye is large and black with a golden rim and there is a suspicion of black around the caudal peduncle. The fin markings provide the main attraction for the hobbyist, however, as every fin except the pectorals is edged with a glorious wide band of black which covers over half the fin. The large mouth is

unusual in that it is being opened and shut rapidly all the time, although the fish never gives one the impression of being in difficulties.

Coming from Malaya, this fish seems likely to be in short supply, and as sex distinctions are not known all available specimens for the immediate future will be wild fish. Silver sharks never hide, they are always in full view, and, from what I have seen of them, seem to be quite tough fish. The shape and unusual colour pattern make them quite out of the ordinary and I feel sure that aquarists will be very anxious to obtain any specimens they see.

The great majority of the tropical fishes which change hands in the hobby in Britain are not wild fishes, as they have been bred in captivity in England or Europe. The rarer kinds, however, of necessity have to be wild fishes and are therefore less robust. Some dealers state quite clearly that their stock in a particular tank are wild fishes. True, such fishes are often larger and better coloured than home-bred types, but they are not acclimatised to the conditions of a modern aquarium in many cases. Care should be taken before introducing them to a choice set-up . . . one may be infecting one's fishes with more troubles than were ever in Pandora's box. Some time ago I purchased two wild barbs. Within hours one of these was lying dead at the surface, the whole flesh stained a vivid salmon colour. I quickly removed it and made an anxious check-up on the other tank occupants. They remained perfectly healthy and one can only conclude that the wild fish fell a rapid victim to unusual conditions. The only time I have seen fishes die stained a peculiar colour is where they have been poisoned, as by new cement.

The general public confine their visits to public aquariums to the summer months in the main. At this period real aquarists find little pleasure in visiting such aquariums as the noise and the crowds make any real observation almost impossible. Winter would seem to be the best period for fanciers but, all too often, the set-up on view is not then at its best; tanks are understocked, often underplanted and showing the need for a thorough spring-clean.

It was with some trepidation therefore that I called in at Blackpool Tower Aquarium one miserable February afternoon to see how it was faring. I was delighted to have the entire aquarium to myself for well over an hour and thus had the opportunity to view the many tanks at leisure. Two things struck me very forcibly. Firstly, the really wonderful plant display in almost every tank for tropicals. I don't think I have ever seen so many excellent plants in such numbers before, on display. I should imagine that just about every well-known plant was on view as well as many less-common varieties. Blue-green algae was conspicuous by its absence. Almost every tank was in sparkling condition and it is a pleasure to record this fact, because one is not always so charmed when visiting public aquariums, in or out of season.

The second major item of interest was the large number of fishes on view and the wide variety offered. One tank contained numerous anabantids, including every colour of paradise fish imaginable; another had perfect specimens of many dwarf cichlids and chocolate gourami. Fully adult fishes are mainly displayed and I was particularly struck

with a tank of cardinal tetras. On closer inspection I realised that only four were cardinals, the other nine being large neons. Seen together, fully grown, they are very similar. Other good specimens included *Metynnus*, red-nosed tetra, blind cave fishes, *Telmatherina ladigesi* (large), headstanders, *Neolebias ansorgei* (rarely seen nowadays), bleeding-heart tetras in fine colour, fine swords and platys, angels and keyholes, cichlids, sunfish, archers, *Barbus filamentosa* and some enormous fish which looked at first glance to be rudd but were in fact *Barbus schwanfeldi*—too large for most tanks.

I noticed three tanks set aside for midgets, for growing-on purposes. The marine specimens are quite gigantic, some being man-size (conger eels) and included sheeps-heads, brill, turbot, trout, whiting, dogfish and nursehounds, pollock, bass, ray, Moray eels, sole, plaice, gurnard, pout and many wrasses. There is also a delightful rock pool, although the inmates seem to wage constant war upon each other. Some clown fish were most lively—what a pity they aren't freshwater tropicals! I noticed that a number of small marine tanks contained bladderwrack; this was disintegrating and generally gave a poor impression on this account.

Coldwater fishes at Blackpool are always large and the tench, orfe, higo, carp, chub and even goldfish would have delighted any angler. One big tank contained over a hundred tench, bream, carp and rudd and one 16-in. pike—an unusual bedfellow.

My feeling on leaving the aquarium was of regret that all the hobbyists in Britain couldn't see how well-set-up good tanks can be and what choice specimens many of the midgets sold by dealers can become in time.

One of the difficulties experienced by hobbyists is that of feeding without fouling the water. In course of time one learns what not to put in the water, such as blood from liver, but there remains the difficulty of over-feeding, which we all do, and the consequent fouling of the gravel. I like to over-feed but my aquaria suffer no ill-effects from waste food left over. My method is very simple. I give the food all in one place, day in day out, usually at the front centre of the tank. The residue would cause trouble if left long but every 3 days I siphon off all the gravel in this area and replace with fresh. This prevents the fouling of the tank and also presents a clean and fresh appearance to the viewer. Old sand which has been siphoned off is washed and put out to dry in the air in the garden for 3 days, when it is then ready for use again. If one keeps three trays going a fresh supply is always available.

We have had "Around the World in 80 Days" and also "80 tunes" and I wondered if we could do it with tropical fishes. It is hard to fix a definite number, owing to the numerous small states of Africa and the West Indian Islands, but the total would not be far out. Consider these: U.S.A., Mexico, Brazil, Venezuela, British, Dutch and French Guiana, Colombia, Ecuador, Peru, Argentina, Panama, Costa Rica, Guatemala, Paraguay, Honduras, Bolivia, Uruguay, Salvador, West Indies, Nicaragua, Japan, China, Korea, Indo-China, Siam, India, Burma, Malaya, Morocco, Ceylon, Australia, New Guinea, Persia, Philippines, Egypt, Arabia (sea), Nigeria, Sierra Leone, Gabon, Congo, Togoland, Mozambique, Sudan, Angola, Zanzibar, etc. We are restricted naturally to the tropical and sub-tropical parts of the world but the list seems enormous. One feature of making up a list of this sort is the realisation that some countries aren't mentioned. For example, have New Zealand or Chile nothing to offer?

For some years I have had a tank with a tubular strip light, not the fluorescent type. The lasting powers of these

lamps vary with the season and the make. Being rather dissatisfied with one which lasted only about 10 days (cost about 8s.), I got in touch with the manufacturers and their representative called upon me. The life span of these lamps is only 1,000 hours and as they cost several times the price of the ordinary type they are of doubtful value for the hobbyist. My own experience has been that they last well in summer when the condensation is least and burn out quickly in winter when condensation is at its worst. Some varieties are clear and others appear to be painted white on the outside of the glass; this flakes off in time into the tank water. A close-fitting lid shortens the life of the lamp both by overheating and condensation. Frankly, I can see no good points for these lamps when compared with the much cheaper normal-type lamps which last just as long and seem more dependable for aquarists.

Newcomers to the hobby delight to have visitors to whom they can show off their fishes and answer questions. Alas, the novelty of showing soon wears off. The longer one has been in the fancy the less one relishes visitors. There comes a time when you know exactly where you stand. You know just how much you know and what you want from the hobby. With many people it is quiet contemplation or breeding effort, and unless you are interested in selling fishes, visitors are not really welcome. The experienced aquarist has long got past the stage of deriving pleasure from the admiring comments of beginners and simply does not want to waste his time in idle conversation. The tyro does not see it this way and hopes to pass an hour or two satisfying his own new-found interest in the hobby. People who drop in on you unexpectedly deserve little sympathy.

I detest the type who make some excuse about "Could you answer a question for me?" when all they want is to get a foot in. I knew one man who seemed to enjoy calling on hobbyists after 10.30 p.m. with always a ready apology. Quite recently an aquarist who knows all there is to know about the hobby and the trade called at 11.30 p.m. and stayed until 1.0 a.m. At this time of the morning I fear my interest in fishes is at a very low ebb! In these days of T.V. visitors are getting less and less welcome. I don't know if Gilbert Harding keeps fishes but, if so, I feel sure he will have a way with unasked, unexpected and unwelcome callers.

During the cold spells of winter we sometimes get quite a few shocks. One day I happened to be passing a tank and saw a large angel fish flat on its side at the surface. Wondering whatever was the matter, I found the water cold (60°F.). It was lucky I passed at that moment; a little longer delay and all the fishes would have died. In this case all ended happily. The heater had failed, a thing which can easily happen but which we never contemplate. A tank in a very cold position usually had a temperature of 80°F., but during a cold spell I found that the temperature never rose above 70°F. whatever I did. The fishes seemed unworried so I left things as they were. When the cold snap ended I found them very lively and the temperature once more back to 80°F.

One night I had to put my terrapins somewhere and for the want of somewhere better I put them in a large bucket with a thermostat and heater, and put them in the bedroom where there is a wall switchboard. I hadn't been asleep half an hour when I was awakened by a terrific noise of splashing from the terrapins and the sounds of the heater and thermostat being knocked about. I got up wondering what was the matter with such usually silent creatures, and discovered that I had forgotten to switch on the current. Elegant terrapins don't like cold water and can kick up quite a fuss when they are as big as the palm of a man's hand!

OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

I know a place where I can obtain *Tubifex* worms. But when I have scooped them up in their rich mud how can I separate them from the filthy muck they inhabit so that I may feed clean worms to my fishes?

One method is to place lumps of the mud known to contain the worms in a fine-meshed sack or bag and suspend it—just touching the surface of the water—over a filled bucket. In an hour or two the worms will wriggle through the interstices of the fabric and congregate in a tight ball at the bottom of the water. Keep in fresh water for a day or two to cleanse them before feeding any of the worms to the fishes.

Please will you tell me how close to the water electric lamps should be to give the utmost benefit to the plant life?

As near as possible; that is, within reason. If the lamps are to be fixed in a hood or casing, arrange the lamp-holders so that the lamps are not more than 6 in. above the surface of the water. And the clearer the water, the less intense the light you will require to keep such light-loving subjects as *Vallisneria* in tip-top condition.

Please can you tell me whether there is a book dealing exclusively with the freshwater fishes of Malaya?

The following books mention, in passing, many of the aquarium fishes indigenous to the East Indies and the islands of the Malay Archipelago: *Exotic Aquarium Fishes* by William T. Innes; *Freshwater Tropical Aquarium Fishes* by G. F. Hervey and J. Hems; *The Complete Guide to Tropical Aquarium Fishes* by Schneider and Whitney. If you can read German, there is that classic work, now out of print, but sometimes found in libraries and secondhand bookshops: *Fremdländische Süßwasserfische* by Arnold and Ahl. But new fishes keep on coming into this country, and the best way to keep up to date is to take out a subscription or give an order to your newsagent, for the regular monthly delivery of this magazine. More fishes are appearing in the dealers' tanks than ever before, and most of the books published are out of date before they come off the press.

Is there any danger of children receiving an electric shock from the equipment used to heat and light a tropical aquarium?

So long as the wires are connected securely to the terminal points of the equipment used, and the joints bound round with several thicknesses of insulating tape, there should not be any danger of electric shocks. A venturesome child is just as likely to receive a shock by placing its finger on the contacts of a table lamp-holder when the current is switched on as it is to play with the connections of aquarium equipment. All that one can do is to make sure that the protective casing around the connections is tough enough to resist meddlesome fingers.

I am very interested in the study of water plants and wonder whether you would be good enough to suggest a title of a book to help me to further my knowledge on the subject?

We suggest you read *Water Gardening* by Frances Perry. This book deals with all sorts of moisture-loving and submerged plants. The section on submerged plants is of great value to the aquarist, coldwater or tropical. The book is published by Country Life Ltd.

A few days ago I found a flame fish entangled and dead in a thick growth of thread algae. I have not seen this danger commented on in aquarium literature. Is it a common occurrence?

It is not a common occurrence for a fish to become entangled in thread algae unless the tank is a small one and the fish has no room to wriggle free. All the same, thread algae can become a menace to small or delicately constructed fishes. When thread algae becomes too fuzzy, it is a good plan to rake it out of the tank, or cut it down with scissors.

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.

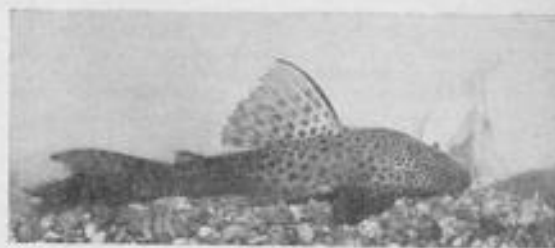


Photo:

W.J. Howes

Plecostomus plecostomus, a catfish often recommended for aquarium cleaning

Are there any fishes which will really eat the mossy green algae which forms on rockwork and the sides of the aquarium?

Yes, some catfish will soon make short work of it. We can recommend *Plecostomus plecostomus* and *Otocinclus* species. The so-called black shark (*Labeo bicolor*) is another fish which will nibble every vestige of soft algae from the rockwork, glass or sandy floor of the aquarium.

Please will you tell me how I can remove the green growth that covers the front glass of my aquarium?

There are several ways of dealing with this problem. The quickest and best way is to scrape the growth away with a safety-razor blade, then, after well washing your hand under a tap—no soap, mind you—gently rub the glass all over with a piece of screwed-up clean newspaper.

I have noticed a tiny insect in my tank which I do not think is a water flea. It looks like a tiny seed with two smaller seeds adhering to it like bladders. It progresses through the water in a zig-zag motion, but very quickly. Have you any idea what this tiny creature might be?

We think that the tiny speck of life you have noticed in your tank is a *Cyclops*. This tiny form of aquatic life lives in salt and fresh water. The female carries her eggs in sacs attached to her body, one on each side. It is said that the descendants of one *Cyclops* would exceed four billion, five hundred million individuals in about a year. Nature, however, keeps *Cyclops* under control by making it the natural prey of fishes and other aquatic creatures. *Cyclops* are often taken in a net with *Daphnia*. They are equally useful as a live food.

Is it a bad policy to mate fish of the same brood together to form the basis of a strain?

So long as the fish selected for mating together possess the desired qualities, and are healthy, it is often the best way to start a strain. But you must not permit weakly fish, or badly coloured fish, to inhabit the same aquarium. If you allow this, they will mate with the first-quality specimens and undo all the good work you have achieved.

I have a coldwater tank planted with *Vallisneria* which I now wish to convert for tropical fishkeeping. Is it possible to make the change-over without going to much expense?

All you need do to convert your tank for tropical fishkeeping is to buy a heater, a thermostat and a thermometer. The *Vallisneria* will flourish even better in warmer water, and as the water is already matured you will be able to introduce tropical fishes into it right away.

Basic Marine Aquarium Technique

by MICHAEL H. ROBINSON

SINCE my article (*The Aquarist*, February 1958) in which I suggested that marine-aquarium keeping was a much more simple affair than is generally realised, I have received a considerable number of enquiries from interested aquarists. Most of the queries have been of a practical nature and I have attempted to answer them in these articles. I should emphasise that my experience has been entirely confined to the construction and maintenance of small-scale aquaria at home and at the school where I teach biology.

Aquarium Construction

Prevention of corrosion is the main problem facing the aquarist who wishes to construct an aquarium for use with sea water. This problem is so important that the possibilities of unconventional materials should be thoroughly explored. The traditional angle-iron aquarium can be treated to enable it to resist corrosion but is basically poorly insulated and subject to a wide range of temperature fluctuations which are not experienced with some of the other forms mentioned below. Angle-iron aquarium frames should be painted before glazing with a non-toxic bituminous paint. Given three coats of this I have found them to resist oxidation for up to 1 year. I must emphasise that the paint should be non-toxic as many bituminous paints contain a toxic vehicle. Many brands of bituminous paints are produced specially for the treatment of drinking-water tanks and are quite suitable and cheap. Glazing



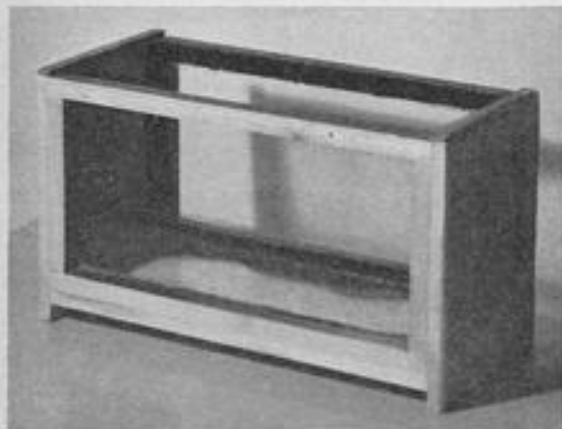
Photos:

S. W. Sligh

Author with the converted sink described in the article



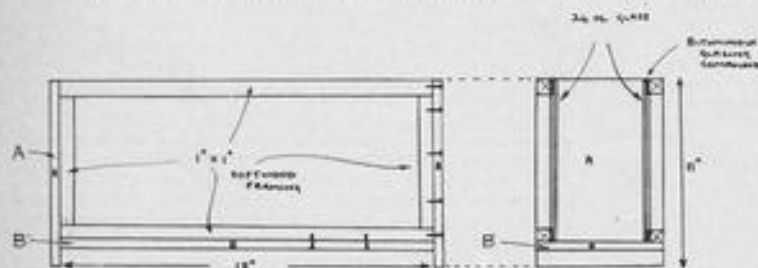
Conversion of a sink into an aquarium. P is the piece sawn out of one side and replaced with a glass panel



The completed simple wooden-framed aquarium

with a bituminous glazing compound completes the adaptation of a conventional aquarium for use with salt water.

Glazed stoneware sinks make excellent marine aquaria and are less subject to temperature fluctuations than angle-iron aquaria. Such sinks have the grave drawback that the occupants have to be viewed from above. This can, however, be obviated by fitting a glass panel in the side (see photograph). In the aquarium illustrated this was achieved by sawing down the side of the sink at each end to a depth of 1 inch from the inside surface of the base. This was done with a hacksaw and the panel was then removed by chiselling across from one saw-cut to the other. This results in a crack along the chisel marks. The opening is then glazed in the normal way; the plug-hole should be covered with a glass



Details of construction of a simple wooden-framed aquarium. Materials required: 3 ft. 6 in. of 9 in. by $\frac{3}{4}$ in. wood; 9 ft. 6 in. of 1 in. by 1 in. wood; 36 (no. 4) 1 in. wood screws and glass. A, End (11 in. by 9 in. by $\frac{3}{4}$ in.); B, base (18 in. by 9 in. by $\frac{3}{4}$ in.). Screws are shown only [at one end and in half of the base

plate bedded in glazing compound, which prevents contamination from the metallic fittings.

Wooden Aquaria

Wooden-framed aquaria are eminently suitable for marine use. I have described the construction of a plywood-framed aquarium previously (*The Aquarist*, March 1954). Construction can be facilitated by the use of modern marine glues. I have also constructed small wooden-framed aquaria from softwood. The accompanying diagram illustrates a simple, cheap and easily constructed example. The one illustrated was made with the simplest of tools in a little over an hour including glazing. These aquaria are rendered leak-proof by completely lining the inside with glass, which should, of course, be bedded with glazing compound at the angles as in a normal aquarium. Larger wooden aquaria can be made in the form of wooden boxes glazed on one side. Marine-quality plywood, though expensive, is excellent for such larger aquaria.

Before stocking the aquarium it should be filled with fresh water for a week, and then emptied after the inside has been thoroughly scrubbed.

Next month suggestions for stocking and maintaining the marine aquarium will be given.

Herpetologist's Notebook

by ROBERT BUSTARD

COMMON frogs and toads have all left the ponds and it is a month since many of the tadpoles wriggled their way out of the protective jelly surrounding them. It is now the peak breeding season for the natterjack toad (*Bufo calamita*) and the edible frogs (*Rana esculenta*) are also mating. By the end of the month the tadpoles of the common species will have reached a "useful size" and will be appreciated as food by such different groups as terrapins, clawed toads (*Xenopus*), axolotls (*Siredon mexicana*) and other aquatic newts and salamanders and baby monitors (*Varema*).

All three species of British newts are still to be found in the water, where they are usually much more easily collected than during their terrestrial phase.

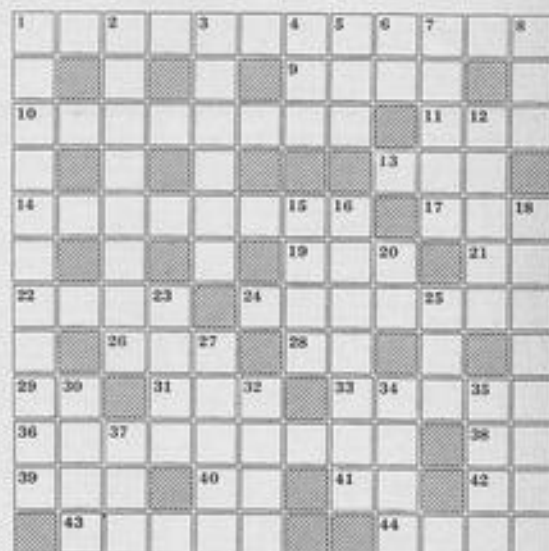
The common lizard, viper and grass snake all mate in April and May, and the slow-worm from the end of April to the end of June. May is the peak mating time for the local and beautiful sand lizards. Specimens caught at this time of the year may well be gravid and care should be taken to see that they are properly housed to ensure that egg-laying and hatching can take place satisfactorily (egg hatching will be discussed next month). With viviparous species (livebearers) no special precautions are necessary.

My chameleons and anoles have been in the outdoor enclosure for several weeks now and May is an ideal time to add to the European species for either the indoor or outdoor reptiliary. Newly purchased specimens of the species listed below can be placed at once in the outdoor enclosure: wall lizard (*Lacerta muralis*); green lizard (*L. viridis*); grass snake (*Natrix natrix*); dice or tessellated snake (*N. tessellata*); green tree frogs (*Hyla arborea*); natterjack toad (*Bufo calamita*); green toad (*B. viridis*); Alpine newt (*Triturus alpestris*); Italian great crested newts (*T. cristatus karelini*); and spotted or striped salamanders (*Salamandra salamandra*), to mention the most popular species, are now available.

Insect life is once again abundant and a wide selection can be caught or bred to provide a change in diet.

The AQUARIST Crossword

Compiled by J. LAUGHLAND



CLUES DOWN

- Ring for cornering food supplies (7, 5)
- Asteroides* (8)
- Treat with iodine to remedy deficiencies (6)
- Obtain (3)
- Position or untruth (3)
- Nine across (1, 1)
- Efts (5)
- Of the same breed (3)
- Dodge (5)
- Savoury dish (4)
- Water lilies (7)
- Idle spars, hopelessly knocked around (8)
- Fellow who deserted (see 9 across) (1, 1)
- When first of the spawn is gone the rest is in pledge (4)
- Meadow (3)
- The element for fishes (5)
- None upset over this fish (4)
- The heredity-carrying factor (4)
- "The river-fox for cunning." (Walton) (4)
- Eros? There is a connection and an end-product! (4)
- Over to 35 (and forgive the awful pun) (3)

CLUES ACROSS

- According to Dr. Johnson they have "a fool at one end and a worm at the other." (7, 5)
- Politician leaves empire for republic (4)
- Without a tail (8)
- Membrane between toes of amphibious creature (3)
- Television broadcasting concern (1, 1, 1)
- Juice of scalded or boiled vegetation, especially as base for breeding microscopic food for fry (8)
- Shad is depressed on losing an aspirate (3)
- Scots chimney (3)
- Of the French (2)
- Fishes do this at surface, tank is lacking oxygen (4)
- Slipper could cause these in pond (7)
- Donkey could cause this, or wash, many (3)
- Exclamation (2)
- Not out (2)
- Not a wage, it gives you a shake (3)
- Aquidom* for A.A. around car (5)
- Most brilliant fish in the tank (4, 5)
- Exclamation of the coarse fisherman, perhaps (2)
- Governor in short (3)
- In French (2)
- I.e. from father leaves only the railway, now nationalised (1, 1)
- Just hesitancy, or royal cypher (1, 1)
- Mother o' pearl (5)
- Fish-lover of sorts (4)

(Solution on page 39)



from AQUARISTS' SOCIETIES

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

AT the Bristol Cold-water Fish Breeders Group the Bristol shubunkin and its attendant details were again discussed at great length, especially the tail. Bristol breeders are paying great attention to this feature this year. Several members spoke of their breeding experiences and of the young they are rearing this year. Several new methods of feeding are being tried, and it will be interesting to learn the results. The red-scaled veiltail keeps its popularity amongst the breeders this year, and all are looking forward to the results. Last year good progress was made with this delightful fish. Quick deep colouring is the ultimate aim. Recently some members of the Group were invited to a meeting of the G.S.O.B. in London.

RECENT activities of the Sheffield and District A.S. have included a Quiz, run on the lines of "Don't" the T.V. Quiz game, with fish caricatures and fishy questions. This has proved very popular and caused a lot of fun. Mr. Pugh Thomas, of Manchester, gave a talk on Marine Life and Aquaria, and although Sheffield was the farthest distance from the sea where he had given this lecture it awoke considerable interest and discussion. The annual outing is scheduled for Sunday, 10th May, and is again, by popular request, to Chester Zoo.

A CHALLENGE has been made by Streatham A.S. to other groups of tropical fishkeepers to compete with them in shows and quizzes. The secretary is Mr. G. D. Stringer, of 8, Grove Lane, Camberwell, London, S.E. (ROD 2508).

AT a recent meeting of the Sunderland and District Aquarists' Club, Mr. Perkins, of Poole House, Durham School, gave a very entertaining talk on the death of a herring fishery in the North Sea area. He mentioned how science has helped the herring fisheries over many years and how gradually the fisheries have been over-fished. Several interesting programmes have been arranged for the forthcoming months. The hon. secretary is Mr. T. Pearson, 31, Sydenham Terrace, Sunderland, Co. Durham.

AT the annual general meeting of the Nottingham and District A.S., Mr. H. P. Lynn, was re-elected president. The vice-chairman and show secretary is Mr. Cyril Hill, and the secretary is Mr. S. Starbuck, 25, Prospect Street, Radford, Nottingham. A vote of thanks was given to Mr. A. L. Kirchin, who resigned as secretary in 1958, after long service, and to Mrs. M. C. Bilyard, the acting secretary for 1958-59.

PRIZEWINNERS in the table show for tropical fish, held at the monthly meeting of Northampton and District A.S., were: 1, J. Stread; 2, N. E. Lyon; 3, J. A. Caserall. Mr. W. H. Snelker was judge. The members also took part in a panel game entitled "I am a fish," devised by Mr. N. E. Lyon. Meetings are now held in the new Y.M.C.A. headquarters, Cheyne Walk, at which new members and visitors will be welcomed.

THE Rochdale and District A.S. held its annual general meeting recently when the following were elected officers for the year: Chairman, Mr. J. L. Anderson; vice-chairman,

Mr. R. Hinchliffe; treasurer, Miss J. Collins; secretary, Mr. G. Davies; correspondence secretary, Mr. R. Hudson. Meetings are held the first Monday of each month at the Coach and Horses Hotel, Lord Street, Rochdale. New members are heartily welcome. All communications should be sent to R. Hudson, 9, Tomlinson Street, Sadden, Rochdale. Lectures and outings are being arranged now for the coming season.

A SUCCESSFUL year, which included non-competitive shows, lectures and trips to places of interest to the fish-keeping and breeding fraternity, was reviewed at the annual general meeting of Derwent Aquarist Club at Derby towards the end of March. The treasurer reported an increased cash balance in hand compared with the previous year. The Club's growing fondness for a general "fish natter" at the monthly meetings was commented on by the chairman, who referred to the difficulty of securing really knowledgeable lecturers. Officers thanked and re-elected were: Chairman, Mr. F. Reader; hon. secretary, Mr. J. Cook, 36, Bolter Street, Derby; hon. treasurer, Mr. T. Swinburne. Members of the committee were re-elected.

AN exhibition of furnished aquaria was staged by Skipton and District A.S. in conjunction with a display of students' work by the Craven Institute of further education. The show was open for three days, and throughout that time

members of the society were available to answer questions. As a means of attracting public attention to the hobby of fishkeeping, the effort was a great success. The Society are to hold an open table show on Sunday, 21st June, and full details may be obtained from Mr. C. Duckett, 2, Shortbank Road, Skipton, Yorkshire.

RECENT activities of the Yeovil and District A.S. included a talk by the president, Mr. N. Stainer, on "Fishkeeping as I see it," and a visit from Mr. Cappaldi, of Bristol, who demonstrated different types of fishes and plants by showing beautiful coloured plates. He also answered questions put to him by members. Forthcoming attractions include a visit to the Weymouth Aquarist Society, and the four-day exhibition at the Bath and West Show, to be held at Yeovil on 3rd to 6th June.

THE Brockley and District Breeders Circle has been invited by the Lewisham Borough Council to exhibit in a Hobbies and Handicrafts Exhibition to be held in the Town Hall, Catford, S.E.6, from 16th to 23rd May. Their display, which will be associated with that of the Lewisham Natural History Society, will feature the activities of the group and the interests of breeding tropical fish. Display boards, furnished tanks and smaller tanks, containing some specimens of fish bred recently, are to be used—and the exhibit is also expected to be used on a number of similar occasions throughout the district during the following summer and winter.

During the Lewisham Council's Exhibition the stand will be stewarded continuously, by practical fish-breeders who are at the moment also taking short courses on such subjects as marine fishkeeping, British freshwater creatures, etc.

LATEST developments for creating greater interest in the hobby for the members of Bethnal Green A.S. are breeders' charts, disease charts and instruction in judging table shows. The first of the 1959 table shows for the Essex, North-East London Aquarists' Association was held at Bethnal Green on 14th April and this is the first of a series of six table shows to be held throughout the coming year. Information about either of these organisations can be obtained from the secretary, A. H. Scott, 80, Ellerman Street, Poplar, E.14.

AT the annual general meeting of the Mansfield and District Aquarists' Society the secretary gave his report of the previous year, stating that membership was improving steadily, and that the Society had agreed to put on a further exhibition at the local N.C.B. three-day show. Arrangements were being made for the first public show, to take place early in June. The treasurer reported the Society was in a moderately satisfactory position financially, and that the year had seen the first presentation of the challenge shield, also the winning of eight plaques at table shows, which were now always well supported. The following officers were elected for the coming year: Chairman, Mr. A. J. Blake; secretary, Mr. C. Hughes, "Parkleigh," Park Hall Road, Mansfield Woodhouse, Notts.; treasurer, Mr. R. Heath; committee, Dr. D. Porter, Messrs. A. Atkins, B. Parkin and A. Lindley.

COMMENCING on Friday, 22nd May, Catford A.S. are holding their first two-day open show. A good show is expected in view of the great number of entries. Twenty classes will be benched and will be judged by F.B.A.S. judges. The "Dix" Cup will be awarded to the best exhibitor in the Catford Charracin Championship and the "Ivans" Cup for the best in the London Egg-laying Tooth Carp Championship. The F.B.A.S. Trophy is being awarded for the best labyrinth in the show and the "Bancroft" Cup will be awarded to the club with the highest points in the inter-club contest.

The show will be open to the public on Friday, at 7 p.m. to 10 p.m., and Saturday, 2 p.m. to 8 p.m. No. 75 or 180 buses from Catford (Hilber Line), or Catford Bridge (for Charing Cross, Waterloo or London Bridge stations),



The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. 6d. together with the Aquarist's Badge Token cut from page xii, to Aquarist's Badge, *The Aquarist*, The Butts, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

both stop outside Catford Secondary School for Boys, Brownhill Road, Catford. Refreshments will be available.

AT the April meeting of the **Covertry Pool and Aquarium Society**, a large audience gave an enthusiastic welcome to Mr. Mason Smith, of Cambridge, who showed a varied programme of films in both colour and black and white. The films, all of which had been made by Mr. Mason Smith himself, included fighting fish of Siam, in which two male fighting fish battled almost to the death for the favours of the female.

During the evening it was announced that Mr. H. S. Greaves, the vice-chairman of the Covertry Society, and well-known to all fishkeepers in the Midlands, was resigning in view of his taking up a post in Australia. Other news was that the annual show this year would be held from 2nd to 5th September at the Old Grammar School, Hales Street.

PROPOSALS put forward at the **Wirral Aquarists' Association** (formerly Birkenhead and District A. and H.S.) annual general meeting were carried practically unanimously, all officers being re-elected en bloc, with the exception of Mr. A. Rankin, who resigned his chairmanship and is now an honorary vice-president.

The new exhibition stand discussion took the whole evening at our second meeting, when a number of ideas were incorporated into what, members hope, will prove to be the final design. Two prospective members were welcomed, Messrs. F. Hilliard and G. Jackson, at this meeting.

AT the last meeting of the **Hounslow and District A.S.**, all three places in a table show for barb were awarded to Mr. M. Worms. While the show was taking place members were shown a fish only six days old under the microscope lens and also the heart beating of a daphnia.

OVER 80 people attended the monthly meeting of the **Ilford and District A.S.** to see a series of four coloured films presented by Mr. Mason Smith, who has recently returned from Kenya; he also showed a film of his travels.

The table show was for any variety Siamese fighters and any variety gouramies. The results were: Siamese fighters—1, Mr. Hunter; 2, H. Parsons; 3, Mr. Stebbing. Gouramies—1, Mr. O'Keefe; 2, Mr. Bennett.

MEMBERS of the **Llanwit Major A.S.** enjoyed a picture evening recently when a large number of colour transparencies were shown. These proved most interesting and were kindly loaned by Hendon A.S.

THIS year the annual show of the **Walthamstow and District A.S.** will be held on the 20th, 21st and 22nd August at Hawthorne Road Hall, Walthamstow.

WE have been informed that the **Todmorden and District A.S.** is once again in active existence. The secretary is Mr. N. D. Brown, 24, Cornholme Terrace, Todmorden, Lancs., and all correspondence should be addressed to him.

THE annual open show of the **Midland Aquarium and Pool Society** will be held at Bingley Hall, Birmingham from 26th to 29th August. The show secretary is Mr. J. Edwards, 6, Amy Terrace, Osler Street, Ladywoods, Birmingham, 16, and further details will be published in a later issue.

RECENT events in the programme of the **Merseyside A.S.** have been a talk by Mr. W. R. Eaves on electricity and a lecture by Mr. W. Kelly on Siamese fighters. There has also been a table show in conjunction with Wirral Aquarists.

THE **South-West Middlesex Aquarist Association** proposes to hold an open show of 20 classes on 12th and 13th June at the Community Centre, Slough. Show rules, schedules and entry forms may be obtained from the show secretary, Mr. E. C. B. Knight, Jasmine House,

Hatch Bridge, Windsor, Berks., on receipt of stamped addressed envelope.

THE **Association of Yorkshire A.S.** has now been in existence for one year and are now taking stock. The annual general meeting will be held in the Textile Hall, Market Street, Drwbury, at 2.30 p.m., 2nd May, and it is hoped to publish more news regarding the Association in the next issue. The hon. secretary is Mr. R. Winterburn, 15, Woodhall Place, Thornbury, Bradford, 3.

NEWS from the **Bradford and District A.S.** includes a note about the open show, which is to be held in the Mechanics Institute, Bradford, from the 14th to 17th October. There will be 13 classes. Forthcoming events also include a table show for cichlids, to be held in May, and one for carps and minnows in June. The secretary is Mr. K. Barrett, 68, Moorland Road, Pudsey, Yorks.

SECRETARY CHANGES

CHANGES of secretaries and addresses have been reported from the following societies: **Dewsbury and District Aquarist Society** (Mr. E. Glyn Peace, Trevortryn, Inaake Lane, Bailey); **Manfield and District Aquarists' Society** (Mr. C. Hughes, Parkleigh, Park Hall Road, Manfield Woodhouse, Notts.); **Paigley Aquarist Society** (Mr. J. N. Macintyre, 47, Lochilbo Road, Barthead, Renfrewshire); **Southend, Leigh and District Aquarist Society** (Mr. D. E. Connor, 227, Southborne Grove, Westcliff); **Wombwell and District Aquarist Society** (Mr. J. Finney, 13, Wilson Street, Wombwell, near Barnsley).

NEW COLDWATER SOCIETY

THE **Northern Goldfish & Pondkeepers Society** has been formed with a view to encouraging and promoting the study and collection of goldfish and Pond Fish.

Application for membership may be forwarded to the undermentioned, the fees for which are members up to 16 years of age 5s. and over 16 years of age 7s. 6d. per year. Mr. R. Lee, 40, Middlewood Street, Gorton, Manchester 18. Mr. N. Mitchell, 3 Harper Street, Longsight, Manchester 12. Mr. J. Coupe, 27, Claremont Grove, Didsbury, Manchester.

HAVE YOU READ

FISH FOODS AND FEEDING

by Feroze N. Ghadially

Written by the well-known "Aquarist" contributor and profusely illustrated, the purpose of this book is to present in as simple a way as possible some facts about feeding fishes.

Summary of Contents

- General Principles
- Feeding Problems Encountered by the Fish Breeder
- Foods of Animal Origin
- Vegetable Foods
- Dried, Bottled and Frozen Foods
- Miscellaneous

Obtainable from:

THE AQUARIST

THE BUTTS,
HALF ACRE, BRENTFORD, MIDDX.

Price 4s. 11d. post free

AQUARIST'S CALENDAR

22nd-23rd May: Catford A.S. open show at Catford Secondary School for Boys (Friday, 7-10 p.m.; Saturday, 2-8 p.m.).

30th May: British Aquarists Study Society Spring Lecture Programme, 2.30 p.m. "White Spot, Cause and Cure" by Dr. F. N. Ghadially. At the Lecture Hall of the Zoological Society of London, Regent's Park, London, N.W.1. Tickets (including tea) 5s. each, from Mr. J. E. Edwards, 42, Berrylands Road, Surbiton, Surrey (Elmbridge 1946).

12th-13th June: South-West Middlesex Aquarist Association open show at Community Centre, Farnham Road, Slough.

27th June: British Aquarists Study Society Spring Lecture Programme, 2.30 p.m. "Funding Out" by W. L. Mandeville; "Spawning Adhesive Egg-layers" by D. McInerney. At the Lecture Hall of the Zoological Society of London, Regent's Park, London, N.W.1. Tickets (including tea) 5s. each, from Mr. J. E. Edwards, 42, Berrylands Road, Surbiton, Surrey (Elmbridge 1946).

10th and 11th July: Macclesfield Aquarium Society (in conjunction with the National Cactus and Succulent Branch) annual exhibition at Stanley Hall, Castle Street, Macclesfield.

1st-9th August: Southend, Leigh and District Society open show at Southend.

20th-22nd August: Walthamstow A.S. annual show at Hawthorne Road Hall, Walthamstow.

26th-29th August: Midland Aquarium Pool Society annual open show at Bingley Hall, Birmingham.

2nd-5th September: Covertry Pool and Aquarium Society open show at Old Grammar School, Hales Street, Coventry.

4th-8th September: Bethnal Green A.S. annual open show at 229, Bethnal Green Road, London, E.2.

8th-12th September: East London A. and P. Association annual show at Central Hall, Barking Road, East Ham, London, E.6.

14th-17th October: Bradford and District A.S. annual show at Mechanics Institute, Bradford.

Society secretaries are invited to send details of forthcoming exhibitions and shows for inclusion in this feature. Full details to help readers wishing to attend those events should be given.

CHARLES HARRIS, HAMPSTEAD

In the above advertiser's announcement which appeared in our April issue the prices of two plants were given in error. *Echinodorus terribilis* and *Echinodorus radicans* were quoted at 4s. 6d. and 6s. 6d. per dozen. In both instances this should have read each.

DO YOU KNOW THE NAMES (Solution)

From above downwards the generic names are *Vallisneria*, *Echinodorus*, *Lobelia*, *Cryptocoryne*, *Ludwigia* and *Isoria*. Thus the second vertical column reads *Acorus*.

Crossword Solution

F	I	S	H	I	N	G	L	I	N	E	S
E	T	O	E	I	R	E	I				
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N	I	E	L	U	M	D	E				
G	A	S	P	R	I	P	P	L	E	S	
R	H	A	W	O	H	E	P				
I	N	W	A	G	A	C	A	R	A		
N	E	O	N	T	E	T	R	A	O	I	
G	O	V	E	N	S	R	E	R			
N	A	C	R	E				P	U	S	