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THE AQUARIIST
 Imports

MANY authorities are expressing fears about the effects of the expanding impor tation of animals of many kinds on the numbers of these species in their natural habitats. It should be the wish of everyone to support any measures designed to protect and encourage species whose numbers are dwindling, so that generations of human beings will be able to live in a world with a fauna and flora no poorer in variety than the one we know. Zoos and animal collectors must be prepared to suffer gaps in their collections and displays to this end.

A step in the right direction has been taken this year in the voluntary agreement of importers of tortoises to stop offering very young tortoises for sale in this country. These small specimens have always been very popular with the pet trade but are quite unsuitable as household pets, and thousands have died yearly in Britain. Larger tortoises have a much better chance of survival here (in the hands of people prepared to consider their special needs), but since they do not breed here their further importation may require to be limited if their natural numbers continue to decline. Dealers in tortoises now have available supplies of free leaflets on the care of these animals, and all purchasers should be urged to study these to keep their pets in good health for more than the single season in Britain that is the life expectation of so many tortoises.

We do not know of any aquarium fish threatened with extinction as a result of collectors' attentions, and in view of the numbers in which fishes naturally reproduce themselves the development of such a situation seems unlikely. However, if it should be found that the increasing demand here and in the U.S.A. for unusual fishes, from, for example, the freshwaters of Africa, was leading to depletion of their numbers we would support wholeheartedly any control it was thought necessary to impose, and however irritating such a step would be for keen aquarists we feel sure that the need for it would be recognised and condoned. Here is another reason why breeders should continually experiment with the new species; the more plentifully the call for them can be met by home-produced stocks the less will the natural resources be ravaged and threatened.
Freshwater Fishes of Vancouver Island

by RICHARD GUPPY

(Photographs by the author)

There has been some discussion among scientists as to whether Vancouver Island was completely devastated during the more recent ice ages. Those who claim that it escaped can point as evidence to a mammalian, reptilian and amphibian fauna nearly as rich as that of the adjacent mainland coast, an unusual condition for islands in high latitudes. It is true that at one point a series of sheltered channels, no more than a mile wide, is all that separates us from the mainland. Most of our mammals, and perhaps the reptiles, could have swum across. But it does seem strange that all the amphibians (nine species) that one might reasonably expect to find on the island are here. An additional half-dozen species reported from northwestern North America are either rare and specialized by nature, or are so near the edge of their climatic toleration, that they reach the British Columbia coast only as stragglers.

It is often we come to freshwater fishes that the case for glaciation seems to be established. Of more than 40 species (excluding salmonids) native to the British Columbia mainland, not one has been found to have established on Vancouver Island. The few that did get here clearly came quite recently by way of the sea, and only one belongs to a typical freshwater family. Since their arrival no extensive geological changes have taken place, which might have left some of them in a truly landlocked situation.

A digression here seems worth while, to contrast the situation outlined above with that found in the British Isles. In the latter we can postulate a land bridge still in existence towards the termination of the last ice age. As a result the count of freshwater fish species compares quite favourably with that of the neighbouring mainland areas. It seems probable, though, that at the time that the last of the bridge disappeared beneath the waves, the climate was still too rigorous for the comfort of some European reptiles and amphibians. These never became a part of the British fauna, though some are able to get along pretty well if introduced now.

Vancouver Island has a quite impressive list of salmonid species, but five of these belong to the genus Oncorhynchus, the Pacific salmon. These are sea fishes included in lists of freshwater fishes because of a brief juvenile period spent there, after which they enter the sea to complete their growth, returning at maturity to spawn and die. A partial exception is the sockeye, O. nerka, which may be up to 3 years of age when first entering the salt water. A race of sockeye known as kokanee, which spend all their lives in freshwater, occur in interior British Columbia, but not on Vancouver Island.

The two species of the genus Salmo have a somewhat better claim to the title of freshwater fishes. The steelhead trout, S. gairdneri, has habits similar to those of the Atlantic salmon, S. salar. Immature steelheads are called rainbow trout. As with the sockeye, the steelhead never seems to have penetrated far enough inland on Vancouver Island to develop a landlocked race. The fish in the Forbidden Plateau lakes, known as Kamloops trout, are landlocked steelheads introduced from the mainland.

The cutthroat trout, Salmo clarkii, appears to be an estuarine and freshwater fish, not often found in the sea. It is noticeable that those individuals found in very small streams, even near the salt water, resemble those occurring in the headwaters of large streams and rivers, where natural obstacles bar free access from the sea. A different form, distinguishable by lighter colour and smaller build, is found in brackish tidal estuaries, and in freshwater areas easily accessible from such estuaries. Some cut-throat trout of the former type may be spoken of as landlocked, but they, along with all other native species, are conspicuously absent from all bodies of water well inland or at higher levels.

The Corridae, or sculpins, comprise a large family of predominantly salt-water fishes. A few species are found in brackish water, and some are entirely adapted to life in freshwater. One of the latter, the prickly sculpin, Cottus asper, occurs in Vancouver Island streams and lakes. In spite of its being by all accounts a strictly freshwater fish, the prickly sculpin seems to have been even less enterprising than the cut-throat trout; it seems to have negotiated only the most trifling of falls and other obstacles. Another species, the Ahladian sculpin, C. alcanthus, is rarer and more local on Vancouver Island, having been found to far only in small streams a short distance from the sea.

We have on the list, of course, the circum-polar three-spined stickleback, Gasterosteus aculeatus. In spite of this being perhaps the best known of freshwater fishes, it cannot resist giving it a bit more space here. From all of the literature concerning it, one cannot learn much about its status as a salt-water fish. That large numbers enter the sea in certain. Though I have not myself seen them far from river mouths, no mention of such a restricted habitat is made in the accounts at my disposal. A newspaper item told of a stickleback attempting to raise.
A fish familiar to British coldwater fishkeepers is the common sunfish (Lepomis gibbosus), a successful introduction to Vancouver Island’s fresh waters.

A family in the Vancouver Aquarium; since it went on to say that a starfish destroyed the net, we can deduce that this constituted an example of the species breeding in salt water.

But I still cannot imagine how a fish which normally lives in a few inches of water could manage its family affairs in waters having a tidal rise and fall of up to 14 feet.

I have noticed, for my part, that sticklebacks commonly breed in brackish pools in salt marshes, which may be replenished with salt water during exceptionally high tides. My guess is that they wander into the sea from these sources, and get there just as breeders; though it is possible that some might return, or discover new breeding places.

I was much interested to notice, recently, literally thousands of sticklebacks under the wharves at the port of Chemainus. Presumably they come from the Chemainus River, the mouth of which is about 4 miles away by sea. To learn where these fish breed, if they breed at all, would be an interesting research project, for which I unfortunately do not have the time.

One fact I can report, they are not breed and I have never seen them there, in those rock pools near high-water line, which support a typical saltwater fauna: barnacles (Balanus), mussels (Mytilus), three crabs (Pachygrapsus and Hemigrapsus) and the tidepool snail (Oligestes manatus).

Many bodies of freshwater on Vancouver Island are populated with sticklebacks. That they should have not bred, without human aid, more than any other fish is quite as one would expect. They can travel in a skin of water during floods, and will survive when trapped in puddles, even when the oxygen content of the water becomes very low.

I mentioned earlier that we do have one native fish belonging to a predominantly freshwater family. This is a coryphaenid, the seapond club, Myctophella caerulea. Its presence, however, does not in the least upset the theory that this was reached Vancouver Island either by human agency or by crossing the salt-water channels. This club in particular has been caught in the sea, under conditions that are not suffering in the least from the experience. Moreover, it inhabits in large numbers a tidal, if not brackish, estuary on the west coast of the island. The most local of our freshwater fishes, it occurs in a pair of adjacent lakes on the east coast, and one on the west. All these lakes are close to the sea, and yet not near it.

Kennedy Lake on the west coast is the largest lake on Vancouver Island. The volume of water discharged is considerable, creating a deep basin which may be nearly fresh. At one time a salmon cannery was situated there, and shoals of chinook could always be seen under the wharves. The breeding habits of chinook are nearly identical with those of our familiar goldfish, and so, even more than with the stickleback, it is difficult to understand how they could manage their spawning in waters having no fixed shoreline. It is easier to imagine, though, that so large a fish as the chan could undertake annual migrations, and that may actually prove to be the answer to the puzzle.

It is evident that we cannot account for these chinook not having reached more lakes on Vancouver Island by supposing that they have specialised requirements. Their other haunt, Quamnel and Holdon Lakes near Nanaimo, could hardly show a greater contrast: to the deep, clear and rocky Kenai and the two east-coast lakes are small, shallow and muddy. There is little doubt that Quamnel and Holden have desertsed the ancestral home of salmon, and that they are not able to spawn in the small lakes on these islands.

Maps show a creek connecting Quamnel with Holden, the latter being nearer to the sea. This passes under a road, and re-vegetation of the locality carefully on foot, I could locate no bridge, culvert or other means of carrying the drainage under the road. It appears that some artificial outlet must have been provided elsewhere. I have not explored the creek which drains Holden, but as it traverses only marshy land, little above sea level, it can be seen that a small amount of drying and reclamation work could block a one-mile free passage for fishes from the sea.

A possible theory that Vancouver Island waters are not favourable to fish life collapses when one views the extraordinary success of some introduced species. It is not surprising that the few salmonids that were brought in have failed to do much, in spite of all efforts. They would, of course, run head on into competition with native species which are closely related. The brown trout, Salmo trutta, is hanging on in one or two streams. The American brook trout, Salvelinus fontinalis, is established in one lake. The Atlantic salmon, Salmo salar, was a failure.

When we come to fish of more specialised families, the story is quite different. Of these only the small mouth bass, Micropterus dolomieu, was offered any encouragement at all. The common sunfish, Lepomis gibbosus, and the brown catfish, Ictalurus (formerly Ambastus) nebulosus, have spread like wildfire from what must have been the flimsiest of toeholds. With regard to the sunfish, it is supposed that fry of this species were accidentally brought into English Bay and B.C. from the U.S.A. In fact, the best story seems to be that they were thrown out by people who tired of them and kept them in aquaria for a time.

Catt in 1959 listed 11 lakes on Vancouver Island known to harbour sunfish. Perhaps some sources of information were missed when these data were compiled, but 1962 at least 40 lakes were known to be occupied by them, though this count included some from which determined attempts have been made to eradicate the sunfish with poison.

The mystery is how these fish manage to get around the way they do. The trout-fishing enthusiasts have just one answer. To spite them people lug the fish around. This only raises the question of who these individuals are who continually risk danger with the law, by transporting live fish. Moreover, so far as I know, there has never been a conviction for that offence. It does seem probable that at times some of the fish species have made inland journeys without human aid, possibly as eggs or fry. But we would suppose this to be the sort of unlikely occurrence that
might take place once in a century or so. One solution
seems about as improbable as the other, and I don’t pre-
tend to know the answer.

Both sunfish and bass are now in Quennell and Holden
lakes. That the club may prove unable to hold out
against the competition of the newcomers is possible but
not by any means certain. But we need have no regrets,
because what is certain is that the trout fanatics will
eventually manage to obtain permission to poison these
lakes. They have so far been stalled off by the landowners,
not, I am afraid, because of any regard for an interesting
fish species, but because of the trouble entailed in keeping
livestock away from the water until such time as the poison
would be dissipated. The peamouth club as a Vancouver
Island species is at any rate safe. Whether it would be
possible to poison a lake as large as Kennedy, I could not
say. It will never be considered, because the lake is a
main spawning ground of British Columbia’s most valuable
commercial fish, the sockeye salmon.

Poisoning lakes, even those which contained no fishers
before the arrival of introduced species, is a practice which
can never be condemned by the true conservationist. We do
not all concur with the view that all freshwaters should be
reserved for a few species valued as “game” fish. To begin
with there are those who would sooner catch course fishes
than hope to catch trout. Many of the lakes in which
carp, sunfish and bass multiply like flies possess no
spawning grounds suitable for trout; the latter must be
maintained by artificial restocking. While it must be
admitted that in this country the killing of birds and
mammals, on the excuse of their edible or game tendencies,
is not tolerated, there seems to be some sense in protecting
wild life with one hand and destroying it with the other.
In fact, an animal population will usually build up to the
point allowed by the food supply, in the face of reasonable
losses, but the sudden cutting off of such food supply can be
detrimental.

Literature referred to in the above consists mainly of the
following:

Carl, Clemens, and Lindsey (1959). The Freshwater
Fishes of British Columbia. Provincial Museum of Natural
History, Victoria, B.C.

Clemens and Wiby (1946). Fishes of the Pacific Coast
of Canada. Fisheries Research Board of Canada, Ottawa.

Changing the Aquatic Scene

by BILLY WHITEHEAD

SOMETIMES one tires of the same aquarium day after day, but decorating a simple aquarium is not as difficult as it would seem. An appreciable change can be made by varying the tank’s lighting and background. Starting effects can be obtained by combinations of back, side and top lighting.

Side lighting can give the tank a new aspect by making the plants stand out in relief. By experimenting, suitable and interesting combinations can be found. Pieces of coloured cellophane—such as those obtained from around mineral water bottles or chocolates—can be slipped between the light source and the glass, to create a new atmosphere. Cellophane should not be in direct contact with the light bulb or it may ignite. As different coloured lights have various effects on plant growth, colored light should only be used when the tank is actually being viewed.

More exotic effects can be obtained by applying one colour of light from, say, the side, and another from the top. A few floating plants will cast interesting shadows if top lighting is used.

A new aquascape can be had by occasionally changing the tank background. By leaning the rear glass of the aquarium unpainted, different backgrounds may be inserted. Several pieces of different coloured paper, cut to the appropriate size, can be used—a black one giving the tank an impression of added depth, and a white one bringing out the colour of fishes and plants and making the whole tank much brighter.

To create an impression of extra depth, a frontless narrow plywood box, about 4 in. deep and of the height and depth of the aquarium, can be constructed. The four sides should be sloped, the rear being about 44 in. smaller than the front; all round. This can be attached to the back glass of the aquarium, the sides painted black, and a suitable background stuck inside the box. Suitable backgrounds can be purchased for a few shillings from a dealer’s shop. The aquarium glass should be kept free from algae so that the box can give the impression of a deep tank fading away into darkness.

Dimensions and design of open box to fit behind a 24 in. by 12 in.
by 12 in. aquarium.

Any of these changes can be made without disturbing the inmates of the tank. Why not experiment with your aquarium and discover several striking combinations to try out on your friends when they next call?

THE AQUARIST
Foods for Coldwater Fishes

Breeding and Keeping Live Foods

by A. Boarder

There are several types of live foods suitable for feeding to coldwater fishes, but all are not easy to breed or keep. The best general live food for most fishes is the garden worm. These are not easy to breed and for the average fish-keeper it is better to collect them and endeavour to store them live for a time. Where one has a garden it is easy to have a small patch which is kept constantly damp, and if covered with old sacking it will soon harbour plenty of worms. A little mature or decaying vegetation will attract the worms and so a few can be taken for use at a time. To keep worms three important points must be borne in mind: they must be damp, cool and dark. I find that if they are kept in earth during warm weather they soon die and smell badly. The best way is to keep them in an earthenware container in a quantity of decaying leaves, beech or oak are good. The container is then covered to exclude the light and kept in a cool place.

White worms (Endotylen) are the next best food and are easily bred once one has a few to start with. I breed mine in concrete boxes in damp peat. A sheet of glass a little smaller than the top of the box is laid directly on the peat and the box is then covered to shut out the light. I use several boxes standing one on the other so that they take up no more floor space than one box. A slice of damp brown bread is placed on the peat and after a time the worms increase in numbers so that many may be saved for feeding. If a few are taken from each box at intervals it will be found that there is an endless supply. If a small knob of cheese is placed in the peat many worms will congregate round it and can be lifted out with tweezers in their thousands. Such boxes will last for many months and when it looks as if the peat has become too impure, a fresh box can be started.

Daphnia or water fleas are not easy to breed in large quantities unless one has two small ponds. A pond is then allowed to become very green with algae and some decaying vegetation is added. When plenty of algae and Endotylen can be seen, a few water fleas can be added and they will then breed well and multiply. After some time they may be noticed that the supply is failing and it is then that the other pond should be taken into use, starting it with Daphnia from the first pond. This first pond is then cleaned out and prepared for another breeding. It is difficult to keep water fleas unless they are in a large container and are not overcrowded. Many collectors are too greedy and pack their travelling cases with so many water fleas that most are dead on arrival home. They should be kept cool and with well oxygenated water; an aerator may even be necessary to keep them alive for long.

Mosquito larvae are best collected from natural ponds and no attempt should be made to breed them as they could become a nuisance if left to mature. They will live for some time in a good algae-infested water, but obviously must not be left too long or they will produce mosquitoes.

Fib克斯 is also best collected and usually can be found in the mud at pond or slow-flowing river sides. If a quantity of mud is washed around in a tea strainer the worms will be left behind in a tight ball. They should be left under running water for a few hours and never fed to fishes soon after having been collected. Unless kept cool and in fresh water they will not live for more than a few days.

Frog tadpoles, a splendid food, will be seasonable. They can be bred in a garden pond where frogs congregate for spawning. In such a case the spawn should be collected and placed in a spare tank to incubate. If left in the pond the young tadpoles will be eaten by the fishes as soon as they are free swimming and so too small to be of much food value. If the spawn is kept in a warm situation the tadpoles will soon hatch out, and if some has been kept cooler there will be a longer source of supply. Once the tadpoles are free swimming they must be fed. When very small they feed on the old spawn and then on very soft decaying vegetation or soft algae. After this they will eat almost anything, both animal and vegetable. Decaying lettuce leaves are a good food for them and as long as they get plenty to eat they soon grow. Once the

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front legs appear they do not eat much and live on the fattened tail until they leave the water. Frog spawn can be collected from natural ponds and it is better to do this if possible rather than to wait until the tadpoles hatch and to catch them then. Frogs normally go to ponds for spawning about the end of February, except in very severe weather.

EGG
RAFT
LARVA
PUDA

Magnified views of aquatic stages in the mosquito’s life cycle

Gentles or maggots can be bred by leaving some stale meat or fish in the open during warm weather. Blowflies will soon find it and lay their eggs. These eggs hatch in warm weather and the maggots grow quickly. They may be collected by having some fine mesh wire netting underneath, when the maggots will fall through on to a tin and can be collected. The disadvantage of this method is that the matter will smell badly and cause an nuisance if near the house. They can sometimes be obtained from a butcher’s shop, but be careful how and when they are asked for. Do not ask when the shop is full of customers. It used to be the practice to send the errand boy to another shop to ask for three penn’orth of gentles from the green boys under the counter. The result when the shop had customers in can be well imagined!

Some of the other live foods which can be collected from the wild are bloodworms, water shrimps and water lice. Bloodworms can be collected in the way described for Tubifex, they often occur in the bottom sediment of rainwater butts. The freshwater shrimps (Gammarus) and water louse (Asellus) are collected by dragging some water weed from a pond and shaking it over sheets of newspaper. Many of the larger fish will take this food eagerly.

Maggots take a long time to breed and if needed are better bought. Brine shrimps are not a very good live food for the coldwater fish-keeper to breed as very warm water in which has been dissolved a quantity of salt is necessary. The eggs hatch in this when the temperature is about 75°F (24°C). However, except for the breeder this food is not worth bothering with. The same applies to micro and Grindal worms. The breeder who wishes to cultivate live foods would do well to get The Aquarist booklet “Fish Food and Feeding” by F. N. Ghadiali (4s. 10d. post free from The Aquarist).

Macrognathus aculeatus

by
JACK HEMS

THIS interesting species belongs to the family Mastacembelidae, popularly referred to as the syline eels (on account of their isolated dorsal spines and their eel-like shape), and is native to the fresh and brackish waters of India, Burma, the Malay Archipelago and Borneo.

In colouration it is dark brown, shading to light beige or greyish white on the underside. Dark marbling and vertical bars decorate the sides. There are, as already mentioned, a number of erectile spines on the anterior part of the back, followed by a soft, ribbon-like fin which is ornamented with three to ten striking black eye-spots margined with pale beige to white. The anal fin is sombre brown to grey, the rounded caudal fin is similarly coloured with some darker markings, and the pectoral fins are clear. There are no ventral fins.

A distinctive feature of this fish is the long, proboscis-like snout which is often used to ferret out live food such as worms from the sand. As a matter of fact, the species is strictly carnivorous, and worms (red or white) must be considered its staple diet.

M. aculeatus is very active and hungry after dark, but hides during the light hours behind rockwork, in clumps of plants, or buried up to its head in the sand. Nevertheless, a few weeks after purchase it will soon learn to recognize the vibrations and sounds associated with the lifting of the cover glass from its aquarium and, the moment this is done, it will swim into view (unless already gorged) and flurry about for its bits.

Apart from providing the necessary sleeping places, about all that is needed to make M. aculeatus feel at home in the aquarium is slighty saline water, a rather fine sand to lie on or burrow into, and a temperature range of 71°F (22°C) to 80°F (27°C).

In the wild it attains herring-size, but under domestication you can consider it fully grown at about 7 inches. In its smaller sizes it is suitable for inclusion in a community tank, but after it has reached 4 inches it is advisable to remove all small and, in particular, slim, fish from its company.

Like most large-growing species it has a life expectancy of several years and, in fairly well-grown specimens, the female can be distinguished from the male by her fuller and deeper body. So far as I can ascertain this member of the Mastacembelidae has not bred in captivity. It sometimes goes under the common name of arrow-nose.

THE AQUARIST
Experiments with Marine Tanks in Hong Kong

by HUSEIN ROFÉ

At the end of my second summer of experiments with marine tanks and fishes, I am appreciatively poorer financially and richer in experience. From the Nordic point of view, our summer lasts into December, and has been again by the following April, though most of the local inhabitants have forsaken the beaches for about 7 months at the onset of October. This leaves me greater space for action, since I often try my luck in the attractive bays of Hong Kong Island, on rocks, among tide pools, snorkling, putting down traps, using a seine or net. It is certainly more agreeable to pursue this frustrating activity without being surrounded by countless noisy spectators in the form of Chinese or English children, whose curiosity might well even lead them to knock over the buckets of fishes collected with such pains. Apart from specimens attractive enough to merit a place of honour in the marine tank, I also spend quite a lot of time on these visits (particularly when the sea is least dangerous) catching small live shrimps, or fry swimming in schools, hundreds together, to serve as a refreshing and welcome change on the menu for my pets, and if I can't even find that much, then I knock lumps off the rocks rather than return empty-handed, since the fresh-water Oases in any rate are extremely partial to limpets, spotting out the shells when they have removed the flesh.

Sources of Supply

Those visits, usually at week-ends, help to solve the problem of finding adequate fresh air and exercise on a small island, and provide some excitement, since every variation of tide or season brings a different aspect to our shores, a change in the types of fishes visiting them, or sometimes the disappointment of having to return home with nothing more than about 1 ounce of newly collected salt water to add to that which must constantly be replenished and stored in a cupboard.

Here I rely on the results of my own haphazard attempts on the shore, and I would not often have an attractive collection of items, but some time ago I discovered the value of helping Chinese fishing boats anchored off-shore. There is usually at least one around, and they are easily induced to come inshore, usually assuming that I want to buy myself part of the catch for dinner. When it is pointed out that I am after the smallest, gaudiest and least valuable specimens, they very often have something to offer, perhaps a butterfly or some SMB fish, and the price is never more than a few cents (usually about 10 to 20) per item! This is also a far safer method of purchase than trying to obtain salt-water specimens from the aquarium shops in the town, for all these dealers do is to obtain them from the fishermen, and then sell them to me for five or ten times the price. By the time the dealers show me what they have to offer, the specimens are already in a much more vulnerable condition, sometimes blind or diseased, and the dealer is much more resentful than the fisherman if I refuse what he has to offer.

The third source of supply is the more serious dealer, the importer who obtains tropical specimens, usually from Ceylon. It is a way of transport to such countries as the United States. Here the price is the highest of all, for I pay approximately twice the U.S. importer's cost price, less the shipping charges. This, however, is the only means of obtaining some of the more colourful coral beauties. I have learnt from experience that I must purchase them within 24 hours of receiving the dealer's telephone call. Not only does he re-ship within 48 hours, but he keeps the fishes in salt water obtained in large metal drums from the harbour, and never filters it before use. Such purchases therefore are not only the dearest but also the heaviest risk. I sterilize them promptly, discard the contaminated water with which he generously offers to supply me free of charge, and leave them in a plastic bucket containing antibiotics for a few days, placing the bucket in full sunlight for a few hours daily. My marine tanks receive no sunlight at all, but I believe in the healing powers of the sun for fishes, and they seem to thrive well under such treatment, although I have never seen it advocated for humans.

Many of our attractive species from the Western Pacific and the Indian Ocean are ignored by the excellent American handbooks on salt-water fishes, probably because they rarely reach the American market in good condition, and perhaps owing to the rich supply of suitable local species. German handbooks deal with them more fully, and often provide the only hints on how to keep them. Nevertheless, I have learnt to treat with reserve many of the statements by marine experts, although they know so very much more about the subject than I do. This is because local conditions here are so different. I have noted often how local Chinese breeders of fresh-water tropicals ignore basic rules of Western aquarists, or even contradict them, and nevertheless succeed. The answer is, of course, the differing climatic and environmental factors.

As a pioneer local hobbyist in the marine field, I sometimes face problems which the best authorities have not foreseen, and there is no colleague in this community to whom I can turn for advice, since even the best dealers have never studied the requirements of the marine tank. Perhaps it is only the knowledge that I am on my own here which has enabled me to keep going, accepting the cost in time and money which learning the hard way entails. Then there is the consolation that Hong Kong is among the world's cheapest spots for such experiment, the knowledge that I can permit myself the luxury of trials which only the very wealthy could afford in some other lands.

My First Tank

Before I ordered my first tank, I was literally terrified by the numerous warnings about the dangers of toxicity, and ordered a special aquarium, which turned out to be made entirely of cement, with a glass pane in front, and with a capacity of about 25 gallons. Owing to some confusion resulting from my inadequate knowledge of Cantonese, I had expected to receive a stone aquarium. There were many warnings about poisonous cement, and in my ignorance, I took this to mean the material of which the tank was constructed, and not the aquarium cement used for the inner sealing. Therefore I had the entire inner surface lined with glass sides and base and sealed with epoxy resin. This proved most unsatisfactory, for the epoxy resin eventually peeled off, salt water seeped between the glass sides and cement walls, became stagnant, and found its way back into the aquarium proper from below.

Please turn to page 13
Decorative Plants for the Pool

It is not the aim of this article to describe the many splendid horticultural varieties of water lily, but rather to direct the interest of the aquarist with a garden pool to some of the less common species of aquatic plants which may be grown out-of-doors, either permanently or for the summer months.

The native white water lily, *Nymphaea alba* var. *alba*, and the hybrid forms offered by nurseries, occurs throughout the British Isles in lakes and ponds and shallow backwaters with a suitable muddy substratum. Its flowers are large and decorative and it is highly suitable for the garden pool. The stout rhizome produces foliage which is exclusively floating, each leaf being almost circular, from 4 to 12 inches in diameter, dark green above, paler and mottled with red below. The flower stalks may be as much as 3 feet long and hold the flowers floating on the surface, except when the plants are cramped, on which occasions the flowers and some of the leaves rise into the air. Each flower is from 4 to 8 inches in diameter, and contains about 20 to 25 white petals of very showy appearance. The species normally blooms during July and August.

The yellow water lily or brandy-bottle, *Nuphar lutea*, often starts to bloom rather earlier, in June. Its smaller yellow flowers rising a few inches out of the water. Similar in its general rhizomatous habit. *N. lutea* differs from *Nymphaea alba* in the shape of its floating leaves, which are ovate-oblong, and in forming submerged leaves, which are ovate to rounded, cordate at the base, translucent and borne on short petioles.

Both these native water lilies are completely hardy and may be established permanently in the garden pool. Their...
by C. D. SCULTHORPE

(Illustrations by the author)

rooting medium must be rich in nutrients. A suitable compost contains 4 parts of loamy garden soil, 2 parts of horse or farmyard manure and 1 part of coarse sand or gravel. This should be contained in a large pot, or wire or plastic basket, and the plant should be very firmly anchored with the growing point of the rhizome just above the surface of the compost. Any depth of water up to about 3 feet is tolerated by Nymphaea alba, up to about 2 feet by Nymphaea lotus, but the available water surface must not be restricted for both species are rapidly-growing plants. The usual mode of propagation is by division of the rhizome, either in the autumn or in the early spring.

The fringed water lily, Nymphaea petala, previously known as L monanthemum nymphaeoides and as Villari nymphaeoides, is another decorative native plant which is easily adapted to life in the garden pool. It is common only in central and eastern England, but is obtainable from most aquatic nurseries: its only disadvantage is that it suffers in hard winters and in areas where frosts are liable to be severe it should be lifted in late autumn and stored under cover until the spring. It has an extensively creeping rhizome which forms profuse adventitious roots at the nodes and from which arise long-petioled floating leaves. These are orbicular in shape, up to 4 inches in diameter, purplish below and mottled with brownish-purple on the glossy green upper surface. In early summer long floating stems are formed and from the axils of the leaves on these there arise aerial stalks bearing clusters of four or five flowers about 2 to 3 inches above the water. Each flower is about 1½ inches in diameter and has five bright yellow petals which are lobed and have attractive shaggy margins. When first obtained, the plant should be rooted in rich loam: roots produced subsequently from the creeping and branching rhizome may be allowed to anchor themselves in the pool bed. In warm sheltered localities, its growth sometimes becomes rampant, a tendency which may be curbed by cutting back several of the long shoots.

For the shallower water at the margins of the pool, L ranunculoides, the floating water plantain, and Ludwigia adscendens, the water primrose, may be strongly recommended, though the latter is only half-hardy and should be stored in a tank indoors or in a greenhouse during the winter in colder localities. Both will thrive in composts of sand and soil, or in the bottom mud: the water depth should preferably be less than 15 inches.

L ranunculoides, formerly known as Alisma natans, produces vigorous floating stems which root profusely at their nodes and may travel 2 or 3 feet from the parent rosette: the young rosettes these stems bear provide a splendid source of new stock. The species bears both submerged and floating foliage: the submerged leaves are linear flattened petioles about 3 to 4 inches long and one-eighth of an inch wide, whereas the long-petioled floating leaves have ovoid or elliptical laminas, about ½ to 1 inch long. It is from the axis of the floating leaves that the flowers arise: they float too, each being about 1½ to 2 inches in diameter, and white with a central yellow marking.

The water primrose, Ludwigia adscendens, is still referred to in some horticultural catalogues as Ludwigia repens: it is an amphibious plant occurring naturally as several distinct
varieties in the Near East, Africa, Asia and America. It possesses long stems which either root in the substratum or remain free-floating, on which occasion the nodes develop pale pink hairy bladders which aid the buoyancy of the plant. The glossy mid-green leaves, which vary in shape from linear-lanceolate to ovate and in length from 1 to 4 inches, are arranged alternately on the stems, and in their axils arise the solitary, bright yellow, "primrose-like" flowers. Established as cuttings, the species grows rapidly and will spread over the littoral water as a carpet of foliage and with blooms in early summer. The most convenient method of wintering it is to transfer it from the pool in late summer, after it has flowered, to a cool aquarium indoors. The water poppy is naturally distributed in stagnant and slow-moving waters in Central and South America, often forming dominant colonies in the shallow regions close inshore. Initially, it should be rooted in a small pot containing a compost of 2 parts of coarse sand to 1 part of loam, ensuring that the roots are well spread and firmly anchored. It will soon produce long stems rooting freely at the nodes and bearing clusters of slender-petioled floating leaves: these leaves are oval to orbicular in shape, ovate at the base, shining green in colour, sometimes marbled with brown, 1 to 2 inches long, and 1 to 1½ inches wide. The aerial flowers may arise solitarily or in clusters of two or three; each is up to 2 inches in diameter, its three petals being bright yellow and its several anthers purplish. Propagation may be achieved by detaching and rooting the lateral shoots arising at the nodes of the main creeping stems.

A similar technique of cultivation may be used for the African Aponogeton distachius, the Cape water haworthia, which also thrives in pools during the warm summer months. It is, however, a larger plant than Hydrocleys, its floating leaves being much larger and heavy enough to be supplemented with some old weathered clay or manure, and should be contained within a large pot or wire or plastic basket. The tuberous rootstock should be firmly anchored in this compost with its growing point just exposed. The foliage consists only of floating leaves, which are long, oval to oblong, 2 to 3 inches wide, and rounded at both base and apex. Aponogeton distachius produces the twin-spurred insect-attracting characteristic of African members of the genus: it stands about 6 inches above the water and it densely clothed with sweetly scented, sulphur-yellow flowers.

One of the most adaptable and decorative of pool plants is the South African Aponogeton distachius, the Cape water haworthia, which is a hardy perennial plant, except in very severe winters, and need not be removed indoors. Its rooting medium should be similar to that recommended for A. desertorum, though it will grow well if it is rooted simply in clay. The floating leaves are similar to those of A. desertorum, being about 6 inches long and 1½ inches wide, oblong-elliptical in shape, and rounded at both base and apex. The two arms of the inflorescence, which may float or stand about 2 inches above the water, bear large fragrant white flowers with jet-black anthers. The blue water haworthia, Aponogeton leptostachyus lilacinus, may finally be mentioned: it is equally desirable but rather more sensitive to temperature, differing from A. distachius in having bluish-violet flowers and in rarely surviving winters out-of-doors. In late summer the rootstock should be lifted out of the pool and stored until the following spring either in a cool aquarium or in damp soil or peat moss in a corner of the greenhouse or garden shed.

Close-up Photography

MANY aquarists have at one time or another probably thought how nice it would be to have a permanent record in the form of a photograph, whether in colour or black and white, of a particularly prized specimen or an aquarium set-up of which they are particularly proud. However, put off by the imagined technicalities or vast expense involved in purchasing the necessary equipment they have despaired of the thought from their minds. These notes are intended for any aquarist who possesses or has access to a good though not necessarily expensive camera, and a desire to obtain scientifically accurate though artistically perfect photographs of his specimens.

Equipment for Going Close

1. The camera. Generally speaking, single or dual lens reflex cameras are the best as they allow accurate focusing on the ground-glass screen right up to the moment of exposure, and the composition of the picture is more accurate. However, it is quite possible to obtain good photographs with normal 35mm or other cameras provided that the focusing distance can be estimated accurately with a close-up rangefinder.

2. Lenses and extension tubes. Most cameras focus down to 3 or sometimes 2 feet with the lens supplied, but for close-up work supplementary lenses, or extension tubes for cameras with interchangeables, are essential. Your photographic dealer will advise you on which is most suitable for your type of camera.

While a solid tripod will be found invaluable to hold the camera perfectly still, a pile of books resting on a table top will be a good substitute. The camera should be quite feasible provided that the camera is held perfectly steady. Another device to eliminate camera shake is a cable release, and this will overcome that inevitable fumble for the shutter release at the crucial moment of exposure.

3. The flash gun. The most important piece of equipment in any branch of photography involving fast-moving subjects at close range is the flash gun. Either the normal battery type, which uses bulbs, or the more expensive electronic flash may be used, although the latter is preferable owing to the capacity for multiple exposures without the necessity for bulb changing. With electronic flash there is virtually no firing delay, the flash reaching its full brightness a few millionths of a second after you press the shutter, the entire operation being over in a thousandth of a second or even fraction thereof, enabling the photographer to ‘stop’ even the fastest swimming fishes instantly.

4. The film. Slow films, of the order of 14-17 DIN, give the best results for a number of reasons, including the fact that they allow great enlargement of the negative without increased ‘graininess’. When using colour film it is essential to use blue flash bulbs if daylight is used to illuminate the tank. Use daylight-type reversal film if you are using electronic flash.

The Photographic Aquarium

Whilst it is possible to use the aquarium in which you house your fish normally for photography it is usual to have a small aquarium specially adapted for the job. Unless of course you wish to photograph the entire set-up, I utilise two small aquariums for the sole purpose of photo-
Photographs by the author

graphy. One measures 8 in. by 6 in. by 3 in. and the other 12 in. by 8 in. by 3 in. The small width ensures that the fishes cannot swim wildly in and out of the field of focus during the taking of shots. The back and sides are painted plain white and I prefer either silver or brown sand as a bottom covering. Of course, in such small tanks it is not possible to have heating apparatus, but the tank covers are equipped with 40 watt bulbs to keep the temperature up and also to supply adequate illumination for focusing. As an added refinement I have cut two slits about one-eighth of an inch wide in the top end members of the frame, about half an inch from the back wall of the tank, and inserted a piece of clear glass cut to the internal depth and length of the tank. This is very useful when for special reasons aquatic plants are needed as a background without the fishes being given the opportunity to hide themselves behind them.

Before use the tank must be thoroughly clean. I always wash the gravel before any operation and make sure that the glass has no smudges or evaporation marks on it, as it is amazing how clearly they stand out in the finished print if allowed to remain. I always use water from an aquarium which is allowed to filter and added crystal-clear; at the same temperature as the water in the tank from which the fishes are to be transferred.

Taking the Photographs

Assuming that the equipment is now assembled with the shutter cocked, the flash gun warmed up, the flash synchro-nised correctly and the specimen in the tank, we are now almost ready to shoot.

The greatest problem which has to be faced is the avoidance of reflections in the multitude of glass surfaces. If the flash gun is pointed straight at the camera and pointed at right angles to the front surface of the aquarium the picture will be fogged by the blinding flash bouncing straight back into the lens, or in some cases a perfect picture of your own camera will appear on your negative.

Angel fish photographed by electronic flash (one head); exposure 1/60 second, f/1

Blue acara photographed by electronic flash (two heads); exposure 1/100 second, f/16

April, 1964
Photographing Reptiles and Amphibians

If taken in an aquarium, reptiles and amphibians pose the same problems as fishes, but as some of the snakes etc. are rather large, it is advisable to dispense with close-up lenses, as it is impossible to get a 3-foot extended or semi-extended specimen in complete focus.

Outside, shoot when the light is bright and diffused, or failing this when the sun is high, to avoid long shadows, as the camera has nearly always to be pointed down on the subject and very dark shadows distort the subject's outline.

Always use fast shutter speeds unless you are certain of the temperament and mood of the specimen, as even lethargic looking lizards move like lightning when suddenly frightened. It is, of course, quite possible to use flash outside if you wish, but when calculating the exposure you must take into account the existing daylight and allow for it.

Try to avoid exaggerated contrast such as black logs against sizzling white sand, but rather aim for a quiet blending, with the subject toning with its surroundings but still distinctly visible. However, this is delving into the realms of the artistic approach to zoological photography which is a subject in itself (see Hugh E. Cook's Zoological Photography in Practice: Fountain Press, for further information).

The main assets necessary for animal photography are a knowledge of the 'personality' of the subject, coupled with extreme patience and the ability to withstand an aching back and progressively blurring eyesight from peering into the viewfinder!

Further examples of the importance of selecting backgrounds for photographic subjects are shown by the horned lizard (left), photographed on silver sand in bright sunlight (1/100 second, 5.6) and the rattlesnake (below), which was placed on coarse gravel and photographed in bright sunlight (1/250 second, 5.6).
The Aquarium at Chessington Zoo

by E. L. KEMP

CHESSINGTON Zoo, in Surrey, has a small but comprehensive collection of reptiles, fishes and amphibians in its aquarium. Here visitors can see the royal python, a most attractively marked snake with clear-cut dark brown markings on a pale reddish brown background. This snake, which is 3 to 5 feet in length, comes from Central and West Africa, where it lives on the grasslands, eating small jumping mice called gerbils, which it hunts by night. The royal python is easy to tame, and is sometimes kept as a rat-catcher in Nigerian houses. When it is alarmed it will curl up into a ball like a hedgehog, so it is sometimes called the ball snake. In Sierra Leone it is also known as the shame snake, as when it does this it is thought to be hiding its head in shame.

Another West African snake to be seen at the Zoo is the sand boa, a burrowing snake whose home is in semi-desert or dry grasslands. The heat of the sand in these areas is so great during the day that these snakes have to bury themselves to avoid the rays of the sun. They are sandy in colour so that they are invisible to their prey, and rather snoutish in shape. They are rather bad tempered, and likely to bite.

The house gecko, like the house mouse and the house sparrow, is a creature which has formed a permanent association with man. It will leave its original habitat amongst rocks, or holes in the ground, for the walls of a bungalow in the tropics, where it will hunt for the insects on which it feeds when they are attracted by the electric light. Gekkos are small lizards with feet that adhere like suckers to the walls of buildings. Various species are found in the hot countries of the world. The gecko in the illustration is a member of the Teguidae. It comes from South America, and in both habit and appearance it resembles the large monitor lizards of the Old World.

The tanks of Chessington's aquarium are full of brightly coloured fishes of great beauty. The pretty glowlight and lemon tetras show the best advantage with their tanks lighted from above. The striking silver and black penguin fish, kept on their own as they are inclined to nip other fishes, are not, of course, so aggressive as the famous Siamese fighting fish, kept in Slam as fanciers once kept; cocks in England, to fight to the death. Males of this species can only be kept with a female. The contrasting colours of the red-headed black shark, this fish one of the most attractive at Chessington, this fish could be said to grace on the algae on the glass of its tank, and on the leaves of water plants, with its finger-like lips. The rosy barbs from India, egg-laying fish about 3 inches long, are also very beautiful. The best colours are obtained where male and female are kept together so that they display to the opposite sex. In the breeding season their cherry barb becomes mahogany-red.

The inhabitants of the aquarium at Chessington change continually. A recent arrival with an interesting history is a crocodile called Kaa, which once lived in the pool at the Berkeley Hotel in London. He was given to the Zoo when he attacked and killed one of the 30 terrapins sharing his accommodation.

April, 1964

Experiments with Marine Tanks

continued from page 7

maggots could actually be seen crawling about behind the glass panels.

When I was about to have the glass torn down and re-cemented, I was told that precisely these cement tanks were among the best for marine fishes, and that there was no question of poison, so since then I have used the tank more successfully without the glass sides. Nevertheless, the problems were not at an end: my horrors, I noted that there were red stains on the sides of the tank. The cement was not only porous, there was iron used in the middle to hold the frames together, despite my strict specification of a non-metal tank. Here I was faced with the very problem which I had taken such precautions to avoid. Nevertheless, while I still use that tank for some of my fishes at the moment of writing, it appears that some specimens, particularly Dasyatis and sea horses, are untroubled by the gradual iron build-up.

To be continued
**Water Snails**

**MR. Billy Whittocide.** In his article “Snails—Aquarium Friends or Foes?” (The Aquarist, February), suggests that a solution of carbon dioxide (soda water) is useful for sterilising aquarium plants to free them from snail eggs. Carbon dioxide solution in water in the form of soda water has no disinfecting properties whatsoever; the best place for soda water is in a glass along with its more normal companion whisky.

I wonder whether Mr. Whittocide has confused soda water from a siphon with a solution of washing soda in water? A solution of washing soda may very well have an effect on snail eggs, but would hardly do the plants much good; I must admit, however, that I have not tried this chemical in this context.

Myself, I find the simplest procedure is to drop the plants intended for the breeding tanks into a bucket of cold water; the shock of sudden immersion in this cold water causes most of the snails to drop off of the plants, and they can nearly all be removed by washing the plants to and fro. The eggs are a different matter; I find it very difficult to exclude them all from the breeding tanks by simple hand-picking.

A really safe method of destroying snail eggs would be a boon not only to aquarists but also to health authorities, for in many parts of the world water snails are carriers of the parasites that cause diseases of both man and his domestic animals. There are a number of chemicals that can be used to kill snails but unfortunately these are also toxic to fishes, and fishes are an important item in the diet of man in the undernourished parts of the world.

Mr. Whittocide refers to the Infusoria or apple snails as *Amphistoma giganteum*; the Infusoria snails belong to the family *Ampullariidae*, which is divided into the genus *Pila*, from the Old World tropics, and the genus *Pomacea*, from the Americas and the West Indies. *Pomacea canaliculata* appears to be the commonest species of Infusoria snail offered for sale in the United Kingdom.

Mr. Whittocide also puts forward the suggestion that plaster of Paris (a form of calcium sulphate) will neutralise any acid present in the water that could harm snail’s shells. Calcium sulphate will dissolve in water to a small extent (about 0.25 gram per 100 millilitres of water at 60°F) and could possibly be used by snails to build the fabric of their shells. It will not, however, react with the comparatively weak organic acids derived from animal and vegetable sources. A piece of marble or limestone (calcium carbonat...)

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**A Show Mourned**

**FROM the pen of Mr. L. B. Katters**’s reply to my letter 2 it would seem that we are never likely to have another National Show. I wonder if Mr. Katters has really thought about the matter very deeply or looked at the idea under modern conditions. I feel that there is every possibility of a show succeeding to-day as it has never done in the past. Recalling the most successful of past shows, I believe it was 1950 when the N.A.S. employed a Public Relations Officer who did a wonderful job, in fact the one real grumble that year was the fact that the Hall was overcrowded and it was difficult to get around the exhibits. The big mistake made that year was there was no Press Office. I myself was sacked by journalists for two National rallies who could not get a story for their paper. Mr. Katters will probably recall that on the opening day Lee’s cartoon in *The Evening News* featured the exhibition. What has been done before can be done again.

Regarding the financial side, the opportunities are so much greater now, especially when one realises how much the scope of the hobby has grown. To-day I feel that not less than a week show should be considered. The entrance fee and entry fees would stand at least a 30 per cent increase and my suggestions about the tanks, I contend, would apply to all sizes and not just the small ones. Again I feel there would be a much greater demand for trade spaces; in fact I am sure that all the available space would be taken.

Mr. Katters’ estimate of the cost of the show may be right but under modern conditions of finance I do not consider this as an insurmountable barrier. I am loath to make the following remarks but the fact is the majority of our readers...
of us are far too old to contemplate running such an exhibition, and Mr. Katters seems to suggest that this could only be done by the 'old hands'!

Replying to Mr. Christian's letter on the same subject, I think it debatable that Nottingham could ever attract the number of aquarists that London can. It is regrettable that in many other hobbies and indeed in most businesses, London is a magnet that cannot be overthrown. However, I sincerely hope that Nottingham will have the success with their show which they have enjoyed for so many years.
T. H. Marshall,
Buckhurst Hill, Essex.

I was interested to read the letters from Mr. T. H. Marshall and Mr. L. B. Katters on the above subject. The latter veteran and I were concerned with the arrangements for the first competitive aquarium show held in this country. This was in September 1926 at 4 Petter Lane, E.C. and was organised by The Amateur Aquarist as your publication was then titled. There were 200 tanks furnished with 9 cwt. of shingle provided by Mr. A. Durham and 2000 plants loaned by Mr. L. B. Katters. When the hobby was reorganising after the war I arranged an inter-club show at Porters Bar and as an innovation invited several clubs to compete in a furnished aquarium class, bringing their own tanks. Some of course, and there were no replacements available. What a mess they made!

If we are to revive a 'National' show to be held in the capital I think that the work and cost must be shared among the clubs. The Goldfish Society of Great Britain could perhaps be responsible for the goldfish classes, the Fancy Guppy Association for the guppy classes and the other coldwater and tropical classes adopted by three or four large London clubs, the whole being held together by the National Aquarists Society with its long experience. It would need to be a modest show with only adult fishes and perhaps open on 1 day only so that exhibitors could bring their fish on Saturday morning and take them home at night. How about The Aquarist taking the initiative as it did 38 years ago? A conference of strong clubs could be called and an ad hoc committee formed. With drive we might get a show in 1965.

M. D. CLINE,
Potter's Bar, Middx.

Blue Platy

I was interested to read Mr. L. B. Katters' remarks on the production of the blue platy and green platy in his article in the March issue of The Aquarist. I would like to ask, however, if anyone has seen a truly blue platy? Certainly fish having a number of blue scales are available and are called blue platys but has an all-blue platy been produced? One colour booklet depicts such a fish on its front cover but I am inclined to think that it is purely the creation of the artist and was not drawn from life.

T. Scarratt,
Littlehampton, Sussex.

Harlequins in Colour

As one who attended last year's Convention at Hendon and saw the marvellous collection of colour photographs of fishes shown by Mr. van den Nieuwenhuizen during his talk I was delighted to see the illustrated article on harlequins by him in The Aquarist (February). I hope that further colour features from this author will be published.

T. BLAND,
Newbury, Bucks.

The AQUARIST Crossword

Compiled by
L. BRADLEY

CLUES ACROSS

1. At which one aquarist competes against fellow aquarists (5-4)
2. Aquarist (5)
3. Char (6-4)
4. Competitor (4)
5. Radiance (5)
6. Shrimp (5)
7. Given at a price and without rest (6-3)
8. Human parasite? (7)
9. Education centre for fish? (7)
10. Filipinos (7)
11. Able to become an island (6)
12. A seasonal creature (6)
13. A sea symbol (6)
14. Needed when breeding of tropical fish is undertaken (5)
15. This order is Japanese (6-3)

CLUES DOWN

1. Be in the centre of this country (3)
2. Goldfish bath (6-6)
3. Australian fish (4)
4. This fish in Gasterosteus sternula (7)
5. Tomtate (3)
6. A part of a fish (4)
7. Japanese fish (6-3)
8. A fish (6)
9. Machine-like person (5)
10. Tomtate formed by having nothing in common (5)
11. Set up eggs (6)
12. Mason (3)
13. Forces (7)
14. A common to pick up (5)
15. Strangely enough they pair but are single (6)
16. Plate with feathery leaves usually found in woodlands (4)

Solution on page 17
Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

AT the Guest Keen & Nettleton's Pond and Aquarium Society's March assembly, the members had a very interesting talk on "Coldwater Fishes" given by Mr. L. Dodge. There were several new aquariums and fish in the assembly, including two from Mr. R. Adams and a display of at least 40 species of the famous "Goldfin" by Mr. W. Williams. The assembly also included a display of "Goldfin" by Mr. W. Williams.

A very interesting talk on "Marine Aquariums" was given recently by Mr. E. Gurney at the dinner held at the Royal Geographical Society. The talk was given to a large audience and was well received. The speaker, Dr. E. Gurney, pointed out some of the difficulties that may be encountered in maintaining marine aquariums. He suggested some general rules for successful maintenance:

1. Use sea water rather than tap water.
2. Maintain a constant temperature.
3. Provide adequate light and filtration.
4. Use appropriate fish species.
5. Keep the aquarium clean.

Mr. W. Williams

Many readers will regret to hear of the death of Mr. W. Williams, who passed away at the age of 78. Mr. Williams was a well-known member of the Bristol Aquarium Club and was very active in the hobby. He was a frequent contributor to the club's newsletter and was always available to offer advice and guidance to other hobbyists. His contributions to the field of aquaristics will be greatly missed.

At the meeting of the Aquarium Club at Waverley, the Secretary, Mr. G. Gurney, reported a substantial increase in membership. The club is expanding at a rapid pace, and new members are always welcome.

Recent Events:

- The annual exhibition of marine aquariums was held at the Royal Geographical Society. The exhibition featured a wide range of aquariums, from small desktop models to large, elaborate displays.
- A new aquarium club was formed in the area, focusing on freshwater aquariums.
- Several new species of fish were introduced to the area, including the popular "Guppy" and the "Goldfish".

Looking forward to the next meeting, the Secretary expressed his enthusiasm for the continued growth and development of the club. He encouraged all members to participate in upcoming events and to share their knowledge and experience with others.

Please note that this is a sample text and may not reflect the actual content of the document.
Mrs. Hammond and members, Mr. Whiteley, J. Uttam-Man and Mr. A. Bragg. The monthly table show resulted in the Championship Trophy for Mrs. E. M. Smith, six-month plaque, Mrs. H. Braun, Championship Trophy (Clematis), Mrs. L. Hartz, six-month plaque, Mrs. L. Hartz.

THE Midland Association of Aquarists Societies third annual convention and open show is being held on Saturday, the 23rd May, at the Dunlop Sports and Social Club, Edlington, Rotherham, by kind invitation of Fort Pat, A.P.N. and the Dunlop Rubber Company. There are twelve classes and the F.E.G.B.S. are also staging twelve sections. The show secretary is Mrs. A. McDonald, 3, Jasmine Road, Cirencester, Cirencester, Glos.

INCREASED attendance monthly are reported from Bradford and District A.S. Recent speakers were Mr. N. H. Dixey on "Aquariums on Charlton" and Mr. A. Whittard on "Electronics". The last table show resulted in a win for Mr. G. Holmes, second being Mr. J. R. Smith and third Mr. H. Fleisher. Leading positions in the 1964 competition are as follows: 1, Mr. H. Fleisher, 13pts.; 2, Mr. J. R. Smith, 7pts.; 3, Mr. G. Holmes and Mr. J. Holmes, 6pts.; 4, Mr. A. A. Smith, 5pts.; 5, Mr. A. W. Crisp, 4pts.

IN the final contest for the North West Regional Group Shield the result was a tie between Willesden and Reading with 131pts. The other positions were: third, Independent, 61pts.; Harefield and Hendon joint fourth with 44pts. The host club was the Independent Aquarist Society and among those present were the Mayor of Macclesfield and Councillor G. Harell and his wife. The result was as follows: 1, Mrs. A. Smith; 2, Mr. Oliver (Hendon); 3, Mr. W. Harell (Reading); 4, Mr. Webster (Willesden); 5, Miss Kettle (Independent); 6, Mr. Terry (Hendos); 7, Mr. Rowley (Reading); 8, Mrs. A. Smith; 9, Mr. W. Harell (Reading); 10, Miss Kettle (Independent); 11, Mr. Webster (Willesden); 12, Mr. Terry (Hendos); 13, Mr. Rowley (Reading); 14, Mrs. A. Smith; 15, Mr. W. Harell (Reading).

The first fish in the show award was won by Mr. Brigs of Reading.

RESULTS of the Bury Aquarist and Zoological Society shows were as follows: February 1: Mr. J. A. Ashworth (Shaw); 2, Mr. C. Crook (Bury); 3, Mr. Singleton (Skelmersdale); 3, Mr. J. Appleton (Skelmersdale); 4, Mr. M. Edmondson (Newton-le-Willows); 5, Mr. J. Appleton (Skelmersdale); 6, Mr. J. Appleton (Skelmersdale); 7, Miss J. Appleton (Skelmersdale); 8, Mr. J. Appleton (Skelmersdale); 9, Mr. J. Appleton (Skelmersdale).

THEKINGTON and District A.S. has now been re-established and interested aquarists should be extremely grateful for any local support at these shows, as are the monthly meetings. The Secretary is Mr. E. Hanlon, 9, Paget Street, Thekegphy, Torksey.

Crossword Solution

| Table | How | ACARA | TABAS | ITAMAIN | CN | BARBUSTETRAZONA | EBSCLN | LRC | TOURSHEENBUSH | PASOUT | OCB | AARI | SCHOOLS | THREADS | SUTT | THOM | ELBATS | TIARAL | LIMP | TEO | RUF | NFA | CORYDORAS | AENEUS | UTD | DETRUI | PAIRS | RISING | SUN |
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<table>
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<td>10 x 10</td>
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### BASED STEEL TANKS

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<tr>
<td>35 x 25</td>
<td>£3.00</td>
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