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Editorial

A FEW years ago we mentioned in *The Aquarist* that at that time journals, of various types, for aquarists were being published from a great many countries of the world, a fact that showed the international appeal of aquarium-keeping. The list of countries did not, however, include Soviet Russia, and, as we remarked then, there was little evidence available for us to judge whether or not there were any Russian aquarists. Now, with the arrival this year of a new Russian journal, published from Moscow, with a title that could be translated as *Fish Culture and Fishing*, we can conclude that the hobby does have a following in Russia. Although the main contents are obviously directed towards the interests of anglers and to the techniques of culture of food fishes on a commercial scale, each of the two issues of the new journal that we have received has a section of two or three pages on aquarium-keeping and there are photographs which indicate that the use of the tropical aquarium as a decorative feature in the home is not unknown in Russia. Pictures in one issue of guppies with flowing finnage show also that breeding of selected varieties is one of the interests of the Russian aquarists. The traditionally humorous aspects of angling are evidently recognised in Russia too, to judge from a cartoon depicting an angler who is proudly displaying his minute single catch behind an out-sized magnifying glass to his admiring wife!

ONE controversy that seems never to be settled is that which debates the safety of using *Tubifex* as a live food for aquarium fishes. Never use it, advise one side, because the worms can introduce disease into your tanks. The other side is made up of aquarists who have used masses of *Tubifex* through the years without trouble. Our own experience agrees with that of the latter group; perhaps it is the source of the worms that is all-important. *Tubifex* collected from the mud below the fish-free Thames in London and used after moderate washing has given us no trouble, but worms collected elsewhere from water in which diseased fishes are present are possibly those responsible for the unfortunate experiences that other aquarists have reported.

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Barracuda—"tiger of the sea"

Operation Barracuda—by MYRON GORDON

(Photographs by the author)

THE Atlantic barracuda really is a dangerous fish. If you are sceptical consider the case of Anthony Sjalikiewicz, a United States Navy carpenter's mate. Together with a group of friends he went swimming in waters off the sun-scorched Coco Sola Naval Base on the Atlantic side of the Panama Canal Zone. Fifty yards off shore, just when he flexed his right leg for a kick, some great beast grabbed him from behind. But all that Sjalikiewicz realised at the time was that some large fish was alongside. At first he felt no pain, but then as the salt water reached the open cut he felt the sting of the bite. He knew that he was badly hurt. He screamed for help, but before anybody knew what he was shouting about, he managed to struggle to shore. His friends rushed him to the Colon Hospital, where his wounds were washed and drained and the terrible gashes in his leg were stitched together.

The Sjalikiewicz case became the talk of the hospital staff. The discussions centred around the nature of the beast that was capable of inflicting so injurious a wound. The peculiarities of the gashes were studied, and Captain Bronson had photographs taken for the United States Navy records. Three aquatic beasts were suspected: the shark, the barracuda and the crocodile, all of which were known to be in the

vicinity—but the crocodile was soon ruled out since it was rarely found in the sea.

Identification of the Attacker

The case of the mysterious attack was not solved by a doctor of medicine but one of science. Dr. Charles M. Breder, Jr., then Research Associate of the New York Aquarium and the American Museum of Natural History, had come down with malaria while on an expedition in Panama's Darien Jungle and was a patient at the hospital. He obtained permission from the superintendent of the hospital to see the victim and to study the nature of the gashes made by the undetermined beast. Breder noted that the deep gashes were straight and clear-cut, not widely curved or jagged. The shape of the wound, he explained, indicated that the beast responsible had straight jaws, long and lance-like teeth that were capable of shearing flesh. Only the barracuda could have done the job. Later, in a report to the American Medical Association, Breder, with his colleague, Eugene Willis Gudger, who had spent several years studying barracuda at Dry Tortugas, Florida, analysed in detail the various types of injuries that each of the three sea beasts might inflict on man.

If a person were bitten by a shark, the lacerations would be less deep but more jagged in outline, because the shark's teeth are like sharp pyramids—not stiletto-like. Since the shark's jaws curve widely the crescent cut would be quite wide. And if the shark should strike its prey once, it would strike it again and again.

The barracuda's power of vision is keen. Its attention is attracted by any unusual activities in its vicinity, such as a swimmer splashing at the surface or a fish hooked on a line fighting to shake itself free. Many of my yellowtails and gray snappers that I had on my fishing line were cut in half by the time I hauled them into the boat. I would have nothing more than a quivering head. Only a barracuda could have done such a neat, guillotine-like job. But barracudas have their weak moments, too, and I found it easy to hook them with the same fish-head they left dangling a few minutes before.

Knowing the barracuda's insatiable curiosity about anything that has a peculiar glint or erratic movement, the native Maoris of New Zealand catch them in a special way. They use a 10-ft. fishing pole and at the end of the line they attach a piece of smooth red pine, 4 in. long, 1 in. wide and



A view of the barracuda's armoury of teeth

a half-inch thick, in which they drive a 2 in. sharp, up-bent spike. When the pine board is wet, it becomes brilliantly crimson and this the barracuda finds most tempting. One fisherman sails the boat briskly, the other handles the trailing lure. As the barracuda snaps at the bait, the Maori swings it aloft and drops it into the boat, while his sailing partner lets the peak halyards fall. Once the fish is freed from the barbless hook, the game is repeated. In Florida the reefers splash rags in the water to attract barracudas, and then catch them on bright, sparkling trolling spoons.

Barracuda Poison

The meat of the barracuda is reputed by some West-Indian natives to be poisonous, and the sickness resulting from eating it is known as ciguatera. Just the same, barracudas are caught in great numbers for food. At the Dry Tortugas Carnegie Laboratory for Marine Biology, our sailors, mechanics and caretakers—all of them Florida reefers—always had a string of large barracudas curing in the sun as they hung on the dock's crane; they claimed that they made excellent jerked-beef.

L. L. Mowbray of the Bermuda Aquarium claims that if the fish is dressed just as soon as it is killed, there is no danger of poisoning. Like many tropical species, the toxins are not in the muscle meat but in the sexual organs, or liver, or spleen or in all of them. Sheer carelessness and the lack of proper refrigeration accounted for many of the cases of ciguatera. In the early days a number of quaint tests were devised to test the wholesomeness of the fish, which when fresh is excellent in flavour. Cuba's greatest ichthyologist, Dr. Felipe Poey, suggested 100 years ago that one ought to try it out on the cat. Our most modern laboratories have found no better way to test its edibility, although the French authority on venomous fishes, A. H. A. Dumeril, had a test of his own. He said: "When a silver spoon or coin, placed in the vessel in which the fish is being cooked, does not become blackened, the flesh may be eaten without fear." This has not been confirmed.

The barracuda is found in all tropical and subtropical waters around the world. Aristotle knew and described it in his *Historia Animalium* as the *Sphyræna*; *sphyræ* meant a pick-hammer to the Greeks. The Italians, French and Spaniards called it *spot* or *spetto*, alluding to the sharp-pointed head. Australians call their toothy species the dingo. Many years after Aristotle, Johann Walbaum in 1792 gave it the specific name *barracuda*; and this has many popular variations, such as barraconta, parracoota, picuda and becuna. In Jamaica it is the couter.

In the Florida Keys the favourite name, other than barracuda, is the tiger-of-the-sea; and it certainly is that. This torpedo-shaped fish has been known to reach a length of 8 ft. and a weight of slightly over 100 lb. When L. L. Mowbray was asked to describe it he said: "While it is cruising, its movements are slow, and its habit of hiding under floating objects reminds one of a submarine lurking in the steamer lanes ready to strike down a passer-by. It will attack with terrific speed almost any kind of sea creature, its own species included, no matter what the size, and with one snap it can sever the body of an unbelievably large fish."

Like its counterpart of the jungles, the tiger-of-the-sea may be trained to docility. Speaking of a captive barracuda in the old Miami Aquarium, Mowbray said: "One of the aquarists would pet the barracuda, much as a child would stroke the back of a cat, and the fish would, in a seemingly gentle way, take food from his hand."

Barracuda have been known to "herd" schools of gray snappers, yellowtails, grunts, parrot fishes, angel fish, surgeon fish, cock-eyed pilots and other fishes. This habit of herding its prey, Gudger said, may be the barracuda's method of keeping a ready supply of food, or else, as he put it, the barracuda "being thoroughly savage and



The needle-sharpness of the teeth can constitute a hazard even when a dead specimen is handled

bloodthirsty, it enjoys the game." In guarding a herd of fish, the barracuda, Gudger said, will "nearly always be found to have its broad forked tail slowly waving from side to side, vibrating very like the tail of a cat watching a rat hole."

One morning at the Loggerhead Key, just as I was about to take my pre-breakfast dive from the dock into the translucent sea, I saw a lurking couter. I ran back to the beach and kept running along the sands for 50 yards, and as I did so the couter kept pacing me, keeping me in his sight. For a while we stared at each other. It was uncanny.

Teeth of the Tiger

The great barracuda probably spawns in very early spring in the region of the Florida Keys, for I caught many young from 1 to 2 in. long in June. I had no trouble in getting one or two of the baby couters with every haul of our 20 ft. seine in waters only 4 ft. deep along the shore off Bird Key Reef. The breeding habits of barracudas are still unknown but it is suspected that their fertilised eggs are pelagic, floating freely with the currents. The 2 in. barracudas were exceedingly delicate and required a steady stream of fresh sea water to keep them alive.

All the small fish I caught had two front teeth at the apex of their pointed lower jaw. As the fish grows these teeth develop into a pair of fangs, which get so big that the upper jaw is deeply indented to make way for them. In one of the big barracudas I caught, one of the two fangs was loose and about to fall out. Many of the bigger fish have but one huge front canine-like tooth set a little off-centre, the other having been lost, discarded or broken away. Many other teeth of almost equal length run the length of two powerful, trap-like jaws. Besides this palisade of formidable teeth, barracudas have two additional rows of many smaller, saw-like teeth. The outer row of big teeth grasps the victim and the inner row of little teeth slice it up. It is as wicked and efficient a dentary apparatus as has ever been devised in any fish.

Even when the barracuda is dead it is dangerous. Its razor-sharp fangs ripped my hand as I was arranging its skull for the picture I took of it. No wonder the Australians call their toothy barracuda the dingo, after their wild dog.

Undersea Encounter

One day I met the great barracuda face to face in his own domain, 15 ft. below the surface of the sea. Equipped



In this head-on view the indentation in the upper jaw which receives the prominent front teeth (only one in this specimen) can be seen

with a diving helmet and an iron cane, I was half walking, half bouncing along in the colourful underwater garden of the Dry Tortugas of Florida, the home of brilliant, un-earthly creatures. A constant flow of air was being pumped into my diving helmet. Low rumbling sounds from the air pump, transmitted along the length of the rubber tube, came down to me from the boat above. I was aware of gurgling noises as huge air bubbles formed about the lower edge of my helmet and escaped under my chin. The bubbles rose to the surface of the blue water, like clusters of wobbling, silvery toy balloons rising to the hazy sky.

I remembered climbing part way down the ladder over the side of the laboratory boat and having the heavy, glass-fronted helmet eased over my head. I remembered the sharp, cutting pain as the edge of the helmet came to rest over my shoulders. I felt awkwardly heavy until I had lowered myself below the water; then I was no longer aware of the weight of the helmet. I hesitated a second, let go of the ladder and I had a fleeting sensation of terror as I drifted downward. There was no jolt when my feet touched the bottom, but I was a bit top-heavy and had to twist my body in order to land upright. I dreaded landing on the spiny sea urchins that studded the white coral floor.

I soon got into the swing of the game. The air came rhythmically in time with the see-saw action of the hand pump in the boat. Faintly, as in a poor telephone connection, I could hear the grinding and squeaking of the pump, and I breathed the air that smelled of old rubber; but soon all these sensations vanished as the vision of a new world opened beneath the sea.

With my 5-ft. iron cane I speared and cut open the soft parts of a sea urchin to attract the fishes. Near a huge mass of living corals they flocked to the kill with amazing swiftness—like turkey buzzards to carrion. Close-up, I saw the community life of a coral homestead, the tiny stone-

building coral animals themselves, the many varieties of marine worms with highly coloured tentacle-like feelers, and fishes of many hues. The fishes did not seem to alter their activities in the slightest because of my presence. Each species had a peculiar rhythmic way of swimming; some glided, some wagged their tails vigorously, some bobbed up and down and others moved steadily and gracefully as if propelled by invisible fins. Slippery dicks in galloping strokes cruised between my legs. Many others passed by me and the scene was constantly changing and it was veiled in a film of unreality.

Suddenly I had an old-fashioned terrestrial sensation; I felt that someone or something was watching me from behind. I turned around as quickly as I could, and there—about 20 ft. away and floating high over my head like a personified fishy dirigible—was a huge barracuda. Again we stared at each other and then I must confess, I quit. I followed my black-rubber air hose as if it were a white line on a foggy mountain road. When I saw the belly of the boat 15 ft. overhead, I crouched and leaped for the dangling ladder. Dr. W. H. Longley, the Director of the Laboratory, and his assistants knew what was up and they were laughing.

"He wouldn't hurt you," the director said. "Why, I've been going down in these waters for 20 years, and a barracuda hasn't nipped me yet. All you have to do is point your cane at them if they get too inquisitive."

I nodded, saying, "I'll remember the next time I go down," and I did. I have never heard of a barracuda injuring a diver; the fish likes to strike only at moving, splashing objects at or near the surface.

The ferocity of the West Indian tiger-of-the-sea was vividly described by the early French and English explorers of the New World. But they also ascribed to the barracuda powers which it does not possess. In 1665 the Sieur de Rochefort claimed that the fish's "teeth have so much venom that its smallest bite becomes mortal if one does not have recourse at that very instant to some powerful remedy in order to abate and turn aside the force of this poison." And in 1707 Sir Hans Sloan asserted that the barracuda "feeds on Blacks, Dogs and Horses, rather than on White men," implying erroneously that the fish discriminates between men and beasts, and between man and man. In 1742 R. P. Labat, a Frenchman, claimed that "the barracuda will more likely attack a beef-eating Englishman than a delicate Frenchman," arguing naively that the more rugged Englishman produces "an exhalation of corpuscles whose odour is more penetrating, which scatter farther, and which strike more upon the organs of these animals." This, of course, was sheer national prejudice rather than fact.

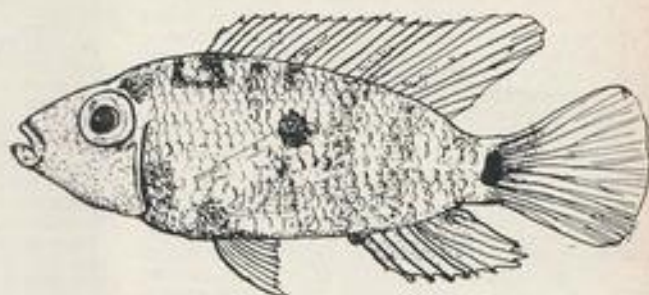
We can discount these silly notions about the barracuda, but the naturalist who knows the barracuda's powers will say to you: Whatever the colour of your skin do not go swimming on the surface of the sea when a barracuda is around.

(This article is based for the most part upon an article in *Natural History*, the magazine of the American Museum of Natural History.)

Fish Feeding in Winter

WITH the advent of cooler weather the appetites of coldwater fishes undergo a change. This is something that will not bother the aquarist with tropical fishes only, but in winter he may have to look around for foods to replace those most readily obtainable in summer. If you have a problem of this kind, or in fact if you are not sure whether your fishes are having a correct diet, you should see *Fish Foods and Feeding*, an AQUARIST booklet by Dr. Feroze N. Ghadially. It costs only 4s. 11d. post free from *The Aquarist*, Brentford, Middlesex.

Chameleon Fish or Brazilian Zebra Fish

(Cichlasoma facetum)

ORDER: Percomorpha, from Greek *perche*—perch, and Greek *morphe*—shape.

FAMILY: Cichlidae, from Greek *ichthys*—a kind of sea fish.

SPECIES: *Cichlasoma*, from Greek *ichthys*—a kind of sea fish, Greek *soma*—body and Latin *facetum*—well-made, or elegant.

THE chameleon fish is a South American cichlid, and when fully grown is by no means a "toy fish," reaching 7 inches overall. Its local name of *chanchito* means, I am told, piglet, and this possibly refers to its pugnacious look, or general overall shape. I prefer the name Brazilian zebra fish, for often the most noticeable feature is the intense and numerous vertical black bars which circle its body, overlaying the primary colour of golden.

Yet chameleon fish is quite accurate, for the fish is liable to rapid changes of colour, the black bars fading out almost completely and the body assuming any shade between pale green and intense brown.

These points are mentioned because an uninitiated purchaser looking, say, for pronounced black stripes, may ignore any specimen which does not show them. Perhaps half an hour after he has left with an inferior fish, the better one he rejected is showing bars as black as soot. Fins, too, may display red or orange, or may not.

The same difficulties confront judges of these fish when they are displayed at exhibitions. Markings for colour must be extremely difficult; there is little except shape and general condition and deportment that can be accurately assessed.

Some writers say that young *Cichlasoma facetum* are quite suitable to keep in community aquaria. I hesitate to advise anyone to ignore the pugnacity of these fish, even when they are young. If too young, they may themselves be eaten or nibbled by the other fishes, and if too large will probably claim a number of victims before being rumbled, and heaven help your plants—they hate them! Far better to set up a large aquarium—36 in. by 15 in. by 15 in.—especially for, say, half a dozen specimens. Such an aquarium will give them room to stretch their fins and keep them tough.

Place a good, thick layer of coarse sand over a half-inch depth of granulated peat, and embed a number of large flat stones in the sand. If this looks too bare or "watery" cover the ends and back of the aquarium with sheets of green paper. It is surprising what a difference this makes.

The temperature of the water need not be high; *C. facetum* can tolerate the low sixties, revel in the middle seventies, breed about 80° F. and can stand the higher eighties for short periods.

Nine months-old fish will breed, provided always that they have been adequately fed with stimulating live foods such as pieces of earthworm, or cooked liver, heart, etc. Their appetites are large. They will consume thousands of *Daphnia*, gnat larvae and bloodworms in the course of a week, and still look round for more. *Tubifex*, crushed snails, *Gadus* larvae—all are acceptable.

Both male and female fish are a little choosy when it comes to pairing. They try each other out, gripping each other mouth to mouth, and indulge in pullings and tuggings up and down the aquarium. If one is noticeably weaker than the other, interest is lost, or the stronger will become vindictive, venting its disappointment by soundly thrashing its substandard companion!

If the pair are "suited," they start looking for a desirable site for the reception of their eggs. All the stones will be carefully scrutinised. When satisfied that the site has been found, both fish will set to work to clean it, sucking away all dirt or algae and fanning the site to keep anything from settling on it.

Eggs are placed on the stone through the female's ovipositor and are fertilised as they come. Once deposited, the expectant parents establish a 24 hours' watch over them, taking turns to keep them clean and carefully to inspect every corner of the aquarium for lurking enemies. In preparation for the arrival of the fry, many depressions are dug in the sandy compost.

Within 4 days, the egg membranes burst and the fry struggle free. Both parents seize them in their mouths—a shock to the onlooker when first seen—and gently spit them into a depression.

Once more the vigil is resumed. As the fry become free-swimming they tend to move around on their own. This is not permitted; the parents marshal them into a school and lead them round the aquarium. Sometimes one parent leads and the other brings up the rear. This gives a much greater measure of control over the stragglings of wayward youngsters.

The parents have large appetites, but the fry are seldom, if ever, satisfied. Micro worms, *Daphnia*, brine shrimp, gnat larvae or pupae, bloodworms, mayfly larvae, *Cyclops*—all go the same way.

Any aquarist attempting to raise large numbers of these fish will need plenty of spare time to find sufficient food for them. Undernourished specimens are of little value; it is far better to spread them around as soon as they are nettable to other interested people and thus avoid considerable expenditure of time and worry for yourself.

by A. BOARDER

I HAVE noticed quite an increase in the number of exhibitors at many of the shows I have visited or judged this year. Several new faces were among the exhibitors and some good fishes are once again appearing on the show bench. This is a good sign for the hobby, as once an aquarist gets sufficiently interested in his fishes to want to show them, his and other people's interest must help the hobby a great deal.

Many good fishes have appeared among the coldwater species and it has been a pleasure to see some good shubunkins, fantails and moors. The veiltails do not seem to be up to standard at most of the shows, colour faults being the most noticeable. Since the last set of Standards for coldwater fishes was introduced by the Federation of British Aquatic Societies there have been one or two rather startling results. According to the Standards the common goldfish can be self-coloured, variegated or nacreous or matt. This is classed as the London shubunkin but yet appears under the heading of the common goldfish. Could this fish rightly be shown in a class for the common goldfish or can it be included in a class for shubunkins only?

Many of the otherwise good shubunkins I have seen have a few hard visible scales and most have one or two gill plates which are hard. Now, the Standards say "No scales to be visible and gill-covers not metallic." There is, however, no mention of the deduction of points for these faults, as was the case in the old Standards, and the only thing is to deduct from the points for the body, only 20 altogether. Against the 20 for body, 20 for fins and 20 for colour, there are 20 points for size and the same for condition and deportment. Surely 20 points could have covered the size, deportment and condition? I have had to judge a class of shubunkins with a 3 in. limit. What is one supposed to do with the 20 points for size in such a case? A big fish in good condition can start off with about 40 points and the smaller choice fish is up against a big handicap in such circumstances.

I have noticed, in at least one show, that the calico fantails were not fantails at all but undeveloped veiltails. The fault always shows up in the shape of the caudal and dorsal fins. In the caudal the ends are not forked enough and the whole fin is full, flowing and rounded like a short veiltail. The tail of the fantail should be well forked and the dorsal held well erect. Many I have seen have a full rounded fin which is similar to that of the veiltail. I think that many aquarists think that it is fair game to show an undeveloped veiltail as a fantail.

I have seen a few metallic veiltails about and they seem all wrong to me. The body is well scaled all right but the finnage appears to be of the soft flowing texture of the calico veiltail. These fish appear to me to be a cross between a scaled fantail and a calico veiltail.

The quality of the furnished tanks has not yet come up to the standard which we saw a few years ago but one or two of the coldwater ones are coming along nicely. Care should be taken to see that the fish are suitable. Golden orfe are very handsome fish and ones I would put among the best for a good-sized pond, but I am not too happy to see them included in a set-up tank, especially when the tank is only 24 in. by 12 in. by 12 in. and the fish are rather large. It has always been my experience that these fish are soon in trouble when the oxygen content of the water is decreased in the slightest degree. How can one then give maximum marks when such fish are included, either for choice of fish or permanency of the tank?

The convention held by the Hendon Club was a great success and it was a real treat to be able to meet so many

No. 72

Freshwater Winkles I



Paludina vivipara
(or *Vivipara vivipara*)

Mollusca (continued)

GENUS: *Paludina*, from Latin *paludis*—a marsh.

SPECIES: *Paludina vivipara*, from above, and Latin *vivus*—living, and Latin *pareo*—to bring forth. Also called *Vivipara vivipara*.

A FULLY-GROWN adult *P. vivipara* cannot be missed—it is almost 1½ in. in height and equally the same in diameter of shell. The shell is striking in colour pattern, having alternating stripes of brown and yellowish brown, arranged laterally. The snail frequents slow-running water, and where found is usually in quantity.

This species is not parthenogenetic or hermaphrodite. There are two distinct sexes, distinguished quite easily by the shape of the tentacles. In the female they are of equal length and slender. The male has only one (the left) similar to those of the female; the right, however, is shorter and thicker. Nor does the female lay spawn—it brings forth batches of young at intervals. These are small replicas of itself and up to 50 in number at a time.

It is independent of atmospheric air, as it possesses gills with which it extracts whatever oxygen it needs from the water.

Its shell is extremely hard and strong—probably no fish except a pike could crush it, and it also possesses a strong trap door (operculum) with which it can seal the entrance to its shell. This probably accounts for the fact that in favourable waters it multiplies exceedingly, for the young have a very great chance of survival.

I have never been able to keep these snails alive for long in an aquarium. They are probably vegetarian, but may eat some animal food. Moving water seems essential—possibly because it is more highly oxygenated.

C. E. C. Cole

well-known aquarists. The films of the fishes, both fresh water and marine, were superb, the colours being exceptionally fine. I liked very much the film of the mice and I predict that this film will win a major award at any film festival.

Exotic Water Plants and Aquarium Decor

by DUNCAN SCULTHORPE

(Photographs by the author)

MANY aquarists seem to take very little trouble over the design of their tanks, being content to buy a few dozen of the usual run of plants, such as *Vallisneria*, *Elodea*, *Cabomba* and *Cryptocoryne*, and to place them almost at random, with little attempt to create a pleasing visual effect. A collection of "toy tropicals" and an interesting selection of aquatic plants go naturally together, and a well-designed plant and rock lay-out forms a fitting and realistic background to a community of fishes or a large number of the same species of fish. To be able to decorate an aquarium as an underwater landscape requires skill, and skill comes through experience and a certain amount of chopping and changing; in most aquarists, however, this restlessness is a familiar streak of character. Why aquarists are often reluctant to try their hand at underwater gardening with the many less-common plants available is therefore something of a puzzle.

Aquatic-plant growing, like many other aspects of the aquarium hobby, need not be shrouded in mystery, or enveloped in technicalities; rather is it merely a matter of common sense. In laying out the rocks and plants, it is important to remember that a tank looks less wide than it really is because of the optical illusions resulting from reflection and refraction. It is obvious that to counteract this the rocks and plants should be arranged to create an illusion of increased depth towards the centre of the "picture."

As a result of the use of perspective in design, conventions have grown, for example, that a large object such as a prominent light-coloured rock should not be placed in a central position in the tank. Generally, designs with such a feature are undoubtedly not as pleasant or effective as those which keep the objects that most interest the eye to the sides; as in photography the points of principal interest

should be situated somewhere on four lines which divide the picture into thirds horizontally and vertically. This convention is, however, not essential, and frequently a pleasing effect is obtained when a large and conspicuous plant is used as a centrepiece.

Rocks and Stones

Since plants are usually of varying, but not very contrasting, shades of green, an element of colour contrast may be introduced by careful selection of rocks and stones. Rocks with a large calcium carbonate content are discouraged, and for colour the most suitable are probably slates, granites and sandstones occurring in lovely shades in counties such as Westmorland and Somerset and Devon. Great varieties of shape and colour are found amongst pebbles in a river bed, whereas those from the sea shore, after careful washing, produce a more bizarre effect in an aquarium. Most writers frown upon the use of rocks with sharp edges and points; my fishes have always been slick enough to avoid these, even when pursued by my net, and I seriously don't think such rocks are more dangerous than any of the other hazards of a fish's aquarium life.

About the disposition of rocks on the aquarium bed, one or two pieces just off-centre give pleasant effects, and more adventurous aquarists often build caves and arches to adorn their tanks. I used to, but the attraction has now worn off. I do think that small flat rocks are useful in holding up the sand or compost and thus creating two or more levels in the aquarium; I also appreciate very much the use of rocks placed in the direction of their natural stratification. Divers, mermaids and ruined castles in the underwater scene are, thankfully, not very popular.

The nature of the aquarium bed is important both as a medium for plant growth and as a feature of the colour of



Two pieces of slate were the only rocks used in the simple lay-out of this small aquarium. Plants used: *Hygrophila* (left); *Myriophyllum* (centre and back, right); *Acorus pusillus* (front, right); *Echinodorus brevipedunculatus* (centre); *Marsilea* (front)



Less-common plant species are used in this small aquarium: *Fontinalis* (back, left); *Vallisneria spiralis* var. *torta* (back, centre); *Lysimachia* and *Synnema* (back, right); *Cardamine* (side, left); *Najas* (behind left stone); *Echinodorus radicans* (centre); *Maculilamia* (side, right); *Myriophyllum proserpinacoides* (front, left); *Samolus* (left stone); *Marsilea* (right stone); *Acorus pusillus* (front, right)



Background of beauty in a 36 in. tank. Plants, left to right: *Hygrophila* with *Vallisneria spiralis* var. *torta* behind and *Synnema* in front; *Aglaonema simplex* (right of stone); *Cryptocoryne* species; *Aponogeton undulatus*; *Myriophyllum* with *Echinodorus* in front; *Najas* (behind stone); *Cardamine* (by air-lift); dwarf plants in the foreground are *Acarus pusillus*, *Aponogeton ulvaceus* (young), *Marsilea*, *Samolus*, spatterdock and *Labelia*

the aquarium. Although in plantless tanks for such fishes as cichlids the rocks become the most prominent features, they and the sand or gravel are not quite as important in appearance in an ordinary decorative tank. I started by using sand as a bed in the aquarium—not fine, red, sea sand, but silver sand which is the most suitable as a rooting medium as the large grains do not accumulate too closely round the root hairs. This soon used to turn black and evil-smelling, and for this reason, the speed of bacterial decay on the surface of the grains, and its monotonous colour, I abandoned it. I have used ever since a mixture of fine and large aquarium "compost," the multicoloured gravel sold commercially. One word of warning here: even if it is supposed to have been washed before purchase, always wash it in cold and boiling water in a pail before putting it in the aquarium. This gravel forms an adequate rooting medium and is a source of pleasant contrast to the green plants.

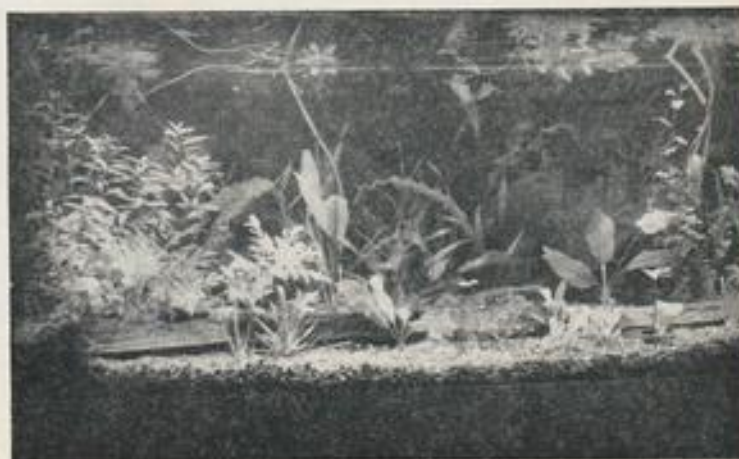
Too much emphasis is often placed on the need for the best possible rooting medium; true water plants have comparatively poor roots, most of the absorption occurring over the whole plant surface, and it is really bog plants that need a little extra-nourishing soil to root in. Even here though, it is to be remembered that bogs are usually stagnant, and physiological complications result from the

presence of toxic acids which probably prevent the ready absorption of many mineral ions and even water, a fact revealed in the structural adaptations of such plants.

Rooting Medium

There is, and always has been, great controversy over the subject of whether to use a soil compost beneath the gravel. Whatever anyone says, it continues to be purely a personal matter; but my word! what tears will be shed and curses breathed before a beginner decides for himself. My honest conclusion is that a bed of peat, loam or other garden compost is unnecessary and, for the very slight improvement in plant growth which results, is not worth the trouble and inconvenience. Peat sometimes proves beneficial in acidifying the water, but this may be easily achieved by straining the aquarium water through a peat bag or nylon stocking full of peat moss; peat certainly does not prove beneficial to plant growth. Practically, no matter how deep is the sand or gravel above the peat or soil layer cloudiness always occurs during planting, or when a certain plant is uprooted to be put elsewhere in the tank. As no two books seem to agree on this cultural point, the beginner must use compost with trepidation, and any strange animalcules or crawling worms which may subsequently appear as a result of quite natural causes are immediately ascribed to the layer

A close-up view of the aquarium pictured in the illustration above, showing tall species at the side: *Elodea*, *Macullamia*, *Indian fern*. Contrast of leaf forms and of light and dark shades is also shown. Dwarf species are growing in the foreground



of soil put in, and sleepless nights ensue until the whole thing has been cleaned out.

Whatever rooting medium is used, always try to plant with your hand, as planting sticks are often rather severe on the frail succulent stems of aquatic plants. The stems of plants used as cuttings should be gently pressed in at an angle of about 45 degrees; great care should be taken with plants such as *Vallisneria*, *Ceratopteris* and *Cryptocoryne* not to bury the crown, as the plant might subsequently rot away. For some time now I have used only a 2 in. sloping bed of gravel, beneath which is a sub-gravel filter; this drags through all the accumulated mulm and makes it available to the plant roots, if they want its components, and at the same time it circulates the water, warming and aerating the gravel and preventing the accumulation of toxic gases as a result of bacterial decomposition.

Plant Growth

It is with this argument about whether soil has a beneficial effect that it becomes increasingly clear that in aquaria plants are not growing in conditions which enable them to flourish and reach the climax of their life cycle by flowering. And, of course, all but a few aquarium plants are true flowering plants, particularly those which grow naturally as bog species. Aquarium conditions are such that it is rare for a species to flower freely as it would in nature; occasionally genera like *Vallisneria*, *Sagittaria*, *Cryptocoryne* and one or two more favour their owner with a few flowers, but this must be because there just happen to be the necessary conditions of lighting. The flowers of some aquatic and bog plants are very inconspicuous and not exciting, but even so, such genera as *Myriophyllum*, *Cabomba* and *Ludwigia* very rarely flower in aquaria with the same profusion as they do in the wild, or in the seemingly more suitable conditions of botanic gardens. The reasons for this lack of flowering in aquaria are not easy to define in positive terms. Firstly, the individual optimum conditions for each species are unknown, which means that we do not have sufficient information about the pH and hardness of water and cycle of day-lengths which would produce the most suitable conditions for flowering. This, however, may not be a bad thing, as with all the myths and general ballyhoo over pH and other physical and chemical conditions which plague the aquarium hobby it is probably more satisfactory that we remain ignorant for the time being. Certain generalisations are, nevertheless, valid.

The aquarist must reconcile himself to the fact that he is trying to grow a mixed community of plants under conditions of light, acidity and temperature which are not ideal

for any one of the many species. He tries to give as much light as he can, and then finds himself fighting algae. As everyone would expect, all aquatics seem to grow faster in full daylight, but to supply this is rarely feasible. Ordinary electric lamps and strip-lights are very good; but the fluorescent tubes have not proved very successful. The amount of light to allow the plants per day may usually have to be determined by trial and error, and I have never found the handy little formulae supplied in some books to be of much use.

Conclusions

The following conclusions may be drawn about the general principles of aquarium lay-out and plant growing:

1. *Compost, gravel and rocks.* Colour contrast is needed in a decorative aquarium and, with this in mind, green slates, red sandstones and variegated and stratified stones are preferred. Similarly commercial gravel is to be preferred to sand as a bed. The advantages of gravel are several; it is a satisfactory rooting medium for all plants, and its large interspaces allow water circulation with a resulting even concentration of oxygen, carbon dioxide and toxic gases produced by bacterial action on organic detritus. The use of soil or peat below the gravel is a moot point; they cannot be used with a sub-gravel filter, but the biological advantages of this appliance have been fully described, and in any case this is one of the points that almost every aquarist decides for himself. The lay-out of rocks and stones is an equally individual affair, but it's useful to remember that a few rocks thoughtfully placed look just as effective as the most complicated arrangement of caves, arches and monuments.

2. *The growing of plants.* A large number of different plants may be grown in a decorative community aquarium, but the theme running through all aquatic-plant growing is that you are merely trying to keep the plants alive and healthy in what is for them, particularly natural bog plants, an unnatural environment. It seems very probable that plants have little effect upon concentrations of oxygen and carbon dioxide in the water, particularly when aeration accelerates gaseous exchange at the water surface. This conclusion has been reached from much experiment since James W. Atz knocked the bottom out of the "balanced-aquarium" myth in 1949, and I cannot do better than recommend aquarists desiring more information to read the reports of the Water Pollution Research Laboratory of Stevenage, Herts. Too little is known of the optimum conditions of light, temperature and acidity for each species,

(Please turn to page 169)



Low-growing species in the centre of a large tank. Species in front of the strata are, left to right: young *Aponogeton ulvaceus* (leaves just beginning to become furled); *Marsilea quadrifolia*; *Samolus parviflorus* (spoon-shaped leaves); *Aponogeton notans* (elongate leaves immediately behind). Just above *A. ulvaceus* are twisted leaves with bold mid-rib—*Echinodorus rostratus*; in the centre are *Cryptocoryne cordata*, *C. griffithii*, *C. willisii* and *C. hartelliana*.

Keeping Sub-tropical Lizards

by ROBERT BUSTARD

THE hobby of keeping reptiles, which is called herpetology, is now very popular in Britain. The purpose of this article is to give a guide to the housing and feeding of newly acquired specimens. The case, or cage, in which captive reptiles are kept is known as a vivarium.

There are many designs of vivaria on the market and the collector intent on purchasing one will be able to make his choice. However, certain principles of design should be borne in mind. Many of those offered for sale are far too small for more than one or two very small lizards, and it is a good plan to buy a large one at the outset. My average-sized vivaria are 24 in. by 20 in. by 20 in.

Types of Vivaria

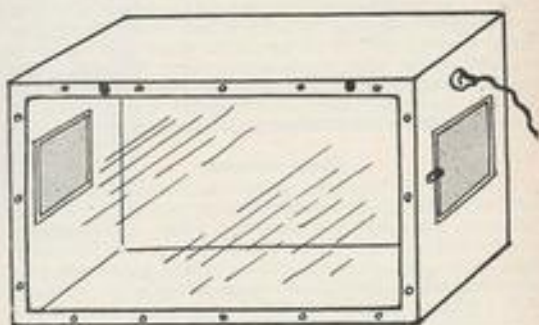
One popular type is designed like a school writing desk. I am not attracted to this design personally, and do not recommend it for specimens requiring heat. I find that the other design illustrated, which is one of my own vivaria, is very convenient, and this finding is the result of years of experience. The lid opens for decoration of the vivarium or for easy cleaning out. The small doors at the side are used for adding or removing specimens and for feeding. The glass front is removable so that it can be easily replaced in case of breakage. This is an important practical point which one should look for when purchasing a vivarium.

All my vivaria are made of metal (galvanised iron). Although this is very expensive—it is the most satisfactory method. I have found that metal is definitely the best medium, since it does not warp like wood when subjected to humid conditions. The vivaria therefore remain fly-proof. I should add that it is quite possible to keep specimens in wooden vivaria and the beginner should not be deterred. Whether he ever progresses from these will depend on how particular he is.

When I first started keeping reptiles I had a very large number of boxes in the attic, most of which were between 3 and 4 ft. long, about 18 to 24 in. wide and about the same height. I sawed these in half, nailed in a 2 in. deep board across the front at the bottom to keep in the compost, and added a sliding glass front to each and had two vivaria suitable for pets. I cut out panels running for about half the width, and about 2 in. deep, near the top of the sides and



Writing-desk type of vivarium. The top glass sheet slides upwards to provide access to the case.



Vivarium made from galvanised-iron frame, as used by the author.

replaced them with perforated-zinc gauze for ventilation. Most boxes, provided that they are not made of wood slats or do not have bad cracks in the wood, can easily and quickly be turned into vivaria by the novice. The only cost is a sheet of glass for the front. It is a good idea to paint such wooden vivaria. I paint my metal ones yellow outside and a sun-cream inside. This gives a feeling of warmth to the human eye. I use ordinary gloss-enamel paint.

Heating the Vivarium

Let us assume that we have either purchased or made a vivarium. We must now turn our attention to heating. This is most important, especially in the winter months, as our pets will not hibernate and will require a temperature of about 70 to 80° F. throughout the year. This is where, in my opinion, most collectors go wrong, owing to lack of guidance. They purchase a vivarium which has heating tubes installed, take it home and put in their reptile pets. The vivarium is then placed where it will receive little if any sunshine, the interior is constantly dull, and they wonder why the animals do not thrive.

It is important to grasp at the outset that most reptiles (with some notable exceptions) are diurnal. They require sunshine (bright light) to make them active, and it is only under such conditions that they will feed. To provide this light I use pearl electric-light bulbs as used in the home. When I first tried these I found that they gave off a lot of heat as well as light and, within the confines of the vivarium, thus raised the temperature considerably. The wattage of the light bulb can be adjusted according to the size of the vivarium to give the required temperature.

In large vivaria it is a good plan to have a light at each end. The lights should be placed in reflectors to reflect the light (and heat) downwards on to the inmates. This is where metal vivaria come into their own, as once they warm up, the sides reflect the heat and they can be kept warm with very little difficulty. I should stress that the light bulbs are the sole means of heating my vivaria! In the winter the whole reptile house is heated up to 55 to 60° F. by means of a stove, but the lights, which are switched on for about 10 hours daily, keep the individual vivaria at the correct temperatures. The bulbs in their reflectors are placed close

to the roof of the vivarium. For wooden vivaria they should be several inches from the roof to prevent charring.

Fluctuations of Heat and Light

To the above method of heating I attribute many of my successes through the years. In addition, much money is saved in electricity bills since light bulbs are much more economical than heating tubes, etc. Also they are switched off at night, thus effecting further economy.

A friend once asked me how I could switch off the lights at night, referring to some desert reptiles of mine basking under the light with the thermometer reading 115° F. I pointed out that I was only following the natural conditions in the desert, where at night, owing to the lack of cloud, the temperature falls fast, often to below 50° F. With desert reptiles and to a slightly lesser extent with specimens from tropical forests I think this day-night differential is important in the rhythm of life.

Feeding Lizards

Feeding can be quite a problem. It can also be solved easily. When one has a number of pets it is hopeless to be dependent on catching all the food required and this should be purchased. Gentles (or maggots) are the larvae of the

bluebottle and can be purchased from bait stores. Many lizards relish them as gentles. If kept for a week or two they pupate and then hatch out as bluebottles, when they are again useful as food for many lizards and indeed form the basic diet of such lizards as chameleons or anoles.

The beginner may find that far too many hatch at one time. I found it a good idea to separate the gentles into three or four different tins. I placed one in a vivarium at 75 to 80° F., another at room temperature (55 to 60° F.) and yet another on the stone floor of the reptile house. I found that by this method, instead of having a mass of food for about a week and then nothing, I could make one pint of gentles last about a month.

Mealworms, which can also be purchased, are a good standby. They will remain as the larvae, which alone are used as food for the lizards, for a long time if kept at about 50 to 60° F. They are easily bred by adding a number to a biscuit tin filled with bran, pieces of stale brown bread, torn-up pieces of newspaper and half of a potato to provide moisture. If they are kept at about 75° F. development will proceed much faster. If several such culture tins are kept, then by using them in rotation there will be a constant supply of mealworms for feeding purposes.

In next month's article we will discuss the keeping of the American anole (or *Anolis* lizard).

Exotic Water Plants

(continued from page 167)

to enable them to be imitated, and the light required in any aquarium can usually only be decided by trial-and-error methods. My final tip on this point, if you like the look of a plant you haven't grown before, is to try several specimens in various situations in a tank, and see if you can persuade them to grow. The last thing to do is start meddling with the water and using fancy potting composts, etc.

3. *Layout of plants.* Cuttings are best planted as bunches—most of them grow adventitious roots at each node and soon root when pressed into the gravel. Take care not to bury the crowns of other plants and make sure that all their roots are covered. It's a good idea to rinse all plants, even if they come from a dealer, in a dilute solution of potassium permanganate for several hours, but try not to leave a deposit of manganese dioxide on the leaves. Excellent effects may be obtained by the skilful use of plants of contrasting shades and leaf forms. Always put tall plants towards the sides and back of a tank, using them to hide the corners, but avoid "barrack-square" arrangements of linear-leaved plants like *Vallisneria*. Masses of certain species always look effective, and try to effect contrast by setting a broad-leaved plant in front of bunches of fine-leaved species, or similar arrangements. Depth can be accentuated to a certain extent by using predominantly dark species at the sides and lighter-coloured plants towards the back and centre; the whole picture may be effectively and naturally framed by planting a few cuttings of a fairly dark, tall-growing species such as *Elodea densa* or *Potamogeton japonicus* in the front corners of the tank. In the more formal arrangements a large and distinctive plant makes quite a pleasant centrepiece, but in the more natural designs, greater effect is obtained by using specimen plants and dwarf species in thoughtful groupings round rocks, whose frequent bareness and hardness of contour are thereby relieved. Perhaps the most useful character in an aquarist for this work is a fertile imagination.

(To be continued)

Readers' Queries Answered

I recently bought four moors for my outdoor pool. I have now heard that they do not like water under 50° F. Will you please confirm if this is correct; should I get the moors out of the pond before winter sets in?

The moors can take the same temperatures as ordinary goldfish but as they generally have rather enlarged finnage this is subject to tail rot or fungus during the winter months. The fish may be all right in the pond but I think that they are never a very suitable fish for the pond as they cannot be any more decorative than common goldfish and are better kept in a tank.

About 6 years ago I bought two coldwater catfish. One died and very occasionally I see the other which has grown considerably. I heard the other day that this fish is dangerous and could eat the small fish. I have not seen any small fish in my pond lately, although there is plenty of cover for them and so they might still be there. Would the catfish eat the fry?

The catfish would certainly eat the small fish and anything large enough to get into its huge gape. I would never put a catfish into my pond, and I use green tetra as scavengers. Mine have grown to a large size now and although they mix with my fantails I have never yet seen one of them interfere with the fantails in any way, although their mouths are large enough to swallow a 2 years-old fantail.

One of my goldfish has developed a translucent jelly-like growth on the snout. It is slowly increasing in size. What is this and what shall I do to clear it up?

It can be only a blister, caused by a knock, or a form of cyst. If the lump appears to be full of liquid, then it can be pricked with a sterilised needle and the fluid can be pressed out. The spot can then be painted with a mixture of equal parts of iodine and glycerine. If it is a cyst it may have to be cut out, or you can wait and it will later burst, when it can be treated as directed above. Lumps do form occasionally on goldfish and they do not seem to trouble them unduly. They often clear up on their own and require no treatment from the aquarist.

The Carp Family—Some Popular Coldwater Species

by LAURENCE E. PERKINS

(Photographs by the author)

THE Cyprinidae is an enormous family of freshwater-fish species which extends throughout Europe and Asia, Africa and North America. Many of the tropical varieties are among the most popular species kept by aquarists, to say nothing of one of the coldwater varieties, the goldfish, which has a complete following of its own.

There are, however, a number of species native to our own ponds and rivers which are less popular among aquarists and pondkeepers than they deserve to be. Seen from above in their natural element they probably appear rather drab creatures in comparison with their colourful foreign relatives, but like our native birds they have a subtlety of colour which makes them things of beauty when examined more closely. Some of the cultivated "sports" are so brilliant that they can easily compete with some of the tropicals for richness of colour. Many of them are ideal for aquarium pets and most are very well suited to life in a modest garden pool.

A favourite with the angling fraternity, the common carp (*Cyprinus carpio*) has also endeared itself to many who keep fishes as pets. Singularly unfussy in its diet and, to a great extent, in the nature of its environment, the carp will happily forage for worms and small crustaceans whilst also enjoying occasional vegetation relief at the expense of aquatic foliage, which it loves to nibble. Hardy in the extreme, it has been known to exist in mud for long periods of time and to withstand extremely low temperatures during the severest of winters. It is possible for the uninitiated to confuse a small specimen with an uncoloured goldfish, but the most obvious difference lies in the carp's possession of two barbels protruding from the sides of its mouth. In weight the common carp can top 40 lb. or more, but as it is

not an excessively rapid grower small specimens can readily be entertained when stocking a garden pond.

The same cannot, however, be said for the hi-goï or golden carp, which is a sport from the common carp. In colour this magnificent fish may be all over copper, gold or attractively mottled in velvety black. Easily tamed, like its near relative the goldfish, the hi-goï could be the ideal ornamental-pond fish, but since it can grow to a length of 2 feet or more in a matter of 6 years it really requires plenty of space and depth.

The mirror or king carp is another variety of the common carp resulting from continuous selective breeding on the continent and especially in Germany, where it is primarily cultivated for its food value and is raised to attain weights of 30 lb. and upwards. The unusual disposition of the few large scales, which are particularly metallic, gives the fish a remarkable appearance only equalled by that of the leather carp, which is even more sparsely scaled but with less iridescence.

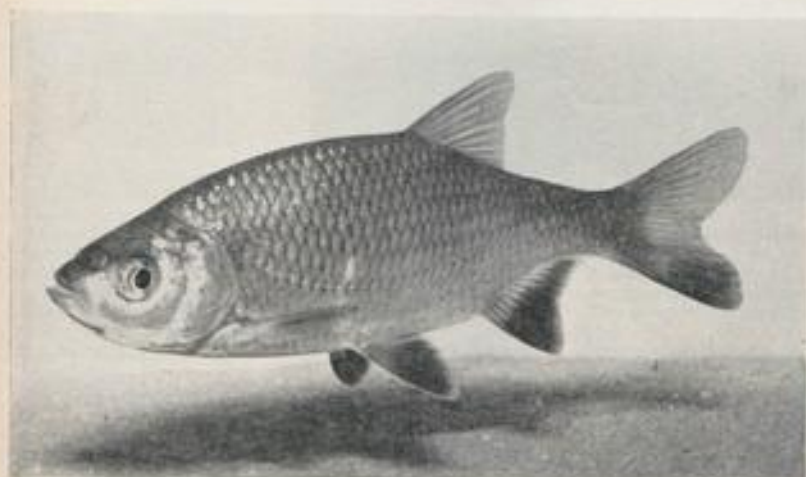
The crucian carp (*Carassius auratus*) is a handsome and friendly fish resembling, fairly closely, the common goldfish except that in good specimens it is much deeper in the body than either the goldfish or the common carp. Possessing no barbels, and with a rounder tail than the common carp, it is richer in colour and often has reddish hued fins. Rarely exceeding 3 lb. in weight and being a slow grower it makes a most attractive aquarium pet.

A shy and retiring fish is the common tench (*Tinca tinca*), which spends a great deal of its time on the bottom where it thrives as a scavenger. Being very partial to molluscs it can more often be heard than seen, when kept in a pool, as it sucks snails or their eggs from the underside of the lily



Golden orfe
(*Leuciscus idus*)

Barbel
(*Barbus barbus*)



Common rudd
(*Scardinius erythrophthalmus*)

Hi-goi or golden carp.
This specimen is mottled
with black





Mirror or king carp

leaves. The golden variety of this fish are, of course, more suitable for the garden pool since they are more readily seen and can be easily distinguished from golden varieties of other species owing to the unique quality of the coloration, which is of an apparently non-metallic nature and of a soft, pinky-gold hue.

The golden orfe was developed abroad from sports

thrown by the common ide, and first became popular as a pond fish in some of the large ornamental lakes in Europe. Owing to the rapidity of its growth, the large size attained and the incessant and speedy activity of this variety, it is most suited to large ponds and lakes and is not, in consequence, frequently favoured by the small-pond owner. Insect-feeders in the main, golden orfe spend most of their

Crucian carp
(*Carassius carassius*)





Common tench
(*Tinca tinca*)

time near the surface and in so doing greatly enhance the appearance of any pool which is suited to their requirements.

One of the cleanest and neatest looking of our native fishes is the common rudd (*Scardinius erythrophthalmus*). Similar to the roach in appearance, it has more strikingly brilliant-red finnage and is less prone to shock and much better suited to pond life, where, however, its full beauty is not as evident as one would like, an aquarium being essential to fully appreciate the smooth outline and richness of colour. For those whose fancy is for something more gaudy or for more showiness in the pool there is a golden variety of rudd which, still with the brilliant-red finnage, is a strikingly handsome fish.

The barbel (*Barbus barbus*) is, in many respects, rather like a giant gudgeon, for apart from its elongated shape it shares similar river-bed-rooting habits for which its ventrally disposed mouth-parts suit it so well. Large specimens of 20 lb. have been recorded, but a good average size is within the region of 8 lb. This is hardly a species to keep if the accent is on the pond rather than the fish, but the

interest value recommends the keeping of a smallish specimen in the aquarium, where it might do well in company with gudgeon and loach, provided that plenty of aeration is supplied.

Australian Fish "Park"

THE Aquarium Society of Western Australia has ambitious plans for a submarine "national park" on the coast at Naval Base. Government approval is being sought for the scheme, which involves the delineation of an area of the sea between two existing moles and about 300 yards out to sea as a reserve in which all forms of marine life would be under protection. The public would be allowed to view the sea life from above water through water glasses or from below water by underwater swimming. A sharkproof fence is suggested to close the open seaward end of the "reserve", and a ban on fishing in the area would be enforced by patrols. It is hoped to accomplish the whole scheme with the aid of voluntary labour only.

Common carp
(*Cyprinus carpio*)



AQUARIST'S Notebook



by

RAYMOND YATES

MY recent remarks about angels and discus staging hunger-strikes concluded with a request for advice on this topic from any aquarist with any new data to offer. It was not long before I heard from Mr. Henry Roth, of New York, who sent me some interesting information on a possible cure. He mentioned that he had had the dubious pleasure of bringing some angels out of this annoying attitude of mind. He found that the first symptom generally goes un-noticed by the hobbyist, this being when the fish takes food into its mouth only to reject it in a moment. As many species of fishes are seen to do this it is dismissed as mere playfulness. Frequently this is all it is, but, where angels are concerned this may be the first sign of an approaching hunger-strike. The stomach of the fish is in the process of turning into a jelly-like mass rather than an organ of digestion, as proved by dissection.

After a day or two the fish finally stops trying to eat and only after some time has elapsed does the aquarist notice anything amiss. Treatment has to be quick as the fish has been ill for some time. This is to dissolve in 1 gallon of tank water 25 milligrams of pyridoxine hydrochloride, in pill form, and to place the fish in this for 24 hours. On its return to the tank the fish may surprise you by its anxiety to make up for lost meals. Do not feed it whilst it is in the pyridoxine solution, as the fish will not eat whilst in the chemical. It may be that a stronger concentration or longer immersion would help in stubborn cases. Young angels afflicted with this trouble never seem to grow as well as their brothers, even after being cured, and are not worth the expenditure of effort to bring them round. Breeding-size angels, however, and discus, most certainly are. Fish which have been treated successfully should be watched for a relapse.

I have not tried out Mr. Roth's suggestion myself, although I did once hear of this treatment before. Pyridoxine can be obtained in England under a trade name (it is actually vitamin B₆) and costs approximately 9 shillings for 25 capsules, each of 20 milligrams. Thanks, Mr. Roth, for the information. Has anybody in Britain tried out this treatment, or any other?

A book which will interest most hobbyists is *Escape to Adventure* by Noel Monckman (Angus and Robertson, Sydney). The author is certainly a man of many parts—scientist, underwater-camera man, musician and writer. Jungles and coral islands are familiar haunts to him and he did much of the underwater photography for the film "The Sea Around Us." As a reporter-observer both of the life of the sea above and below water, he can have few equals.

He mentions that there are no alligators in Australia; they are all crocodiles, the salt-water variety *C. porosus*, and the smaller freshwater kind *C. johnstoni*. There are many differences between the crocodile and the alligator: e.g., the snout of the former is spatulate but that of the latter is shovel-shaped; the lower jaw of the crocodile has canine teeth which fit into a notch in the upper jaw so that the teeth are always partly visible, not so with the alligator. There are also differences in the feet but the greatest difference lies in the savagery and strength of the two creatures. The alligator is a sleepy, good-natured beast compared with the crocodile and lacks the remarkable strength and agility of the latter. The eggs (about 40) are laid in a nest or mound of rotting vegetation about 3 ft. high, and this generates all the heat necessary for hatching. The shells are thin and easily cracked but there is also a tough skin of parchment-like qualities.

There are many vivid moments described with the

poisonous horrors of the sea such as coral, stone fish, lion fish and the deadly cone shell. One reads with pleasure how the poisonous anemones are themselves eaten by a nudibranch which uses the poison darts of its meal for its own protection. Mr. Monckman has his own suggestions to offer on many aspects of the origin of life and he goes on to explain that perhaps the most plausible hypothesis comes from the peculiar behaviour of the viruses. Although invisible even under the microscope they can be seen in the mass in crystalline form. No ordinary living substance can survive repeated crystallisation, but viruses can, and when returned to normal conditions they resume their way of life and begin to multiply.

Experiments indicate that in some far-distant past some warm primaevial pool contained in solution all the elements necessary for the existence of a virus type of organism, and here developed a protein crystal which eventually developed into a virus. Evolutionary steps could have led to visible bacteria-like organisms and then to flagellates and so upwards. The author suggests that perhaps there is no fundamental difference between organic (living) and inorganic (non-living) matter and they may really be one, but in different forms. In the words of the poet, W. H. Carruth,

"A fire-mist and a planet, A crystal and a cell,
A jellyfish and a saurian, And a cave where
the cavemen dwell,
Then a sense of law and beauty, And a face
turned from the clod,
Some call it Evolution, And others call it God."

A book well worth reading.

In August I was in Matlock Bath and took the opportunity to visit the famous fish pond there. It was, as ever, quite the centre of attraction and there were large numbers of holidaymakers looking on. The fishes consist mainly of large chub, two enormous hi-goi, a very corpulent goldfish, some rudd and a few minnows. The hundred-odd fishes are almost all large and disdain to take notice of the madding crowd. Time was when anything falling on the water was the signal for a concerted rush by every fish in the pool. Not so now. Not a single fish evinced the slightest interest in any food. Quite a lot of the chub showed noticeable injuries, a fault which detracts from their charm. The smaller pond contained about a dozen small chub and the goldfish pond below about 100 nondescript goldfish.

The river Derwent, which runs alongside beneath the High Tor, is full of grayling and trout, but the local boys were making successful catches of minnows in the local way. This consisted of attaching a 1-pound jam jar to about 10 yards of thick string. The mouth of the jar is covered with a lid, which has a circular hole bored in it about 1½ in. diameter. Inside the jar is something bright and attractive. The youthful fishermen fling the jar out in the deep river and wait for 5 minutes. When they pull in the jar one or more minnows are almost invariably imprisoned therein. A somewhat similar method is used in the Lake District.

In a Matlock shop I noticed something quite new to me in Britain—tinned snails. The pack consisted of a tin of 24 snails and 24 shells (loose), price 11s. 3d. This quite put me off my tea. There used to be a night spot called

L'Escargot d'Or, and at this price these snails were almost in this category! Pity that aquarists cannot dispose of their surplus snails at such prices.

I admired the rather continental-type fountain on the Promenade at Cheltenham whilst in that area. What a pity this fountain, which is really 40 fountains in one, contains no fishes. It would add to the attraction.

Mr. B. H. Nunn, of Portsmouth, who showed me his tropical fish collection a year or two ago, tells of an instance where drying out of a tank failed to eradicate white spot. It seems an outbreak of white spot appeared at a show and one of the affected tanks was taken home by one of the judges for investigation. The tank was placed in a sunny position and allowed to dry out in the fish house. It was left in this state for 2 or 3 weeks. After it was refilled with tap water free-swimming white-spot parasites were found after 2 or 3 days. This seems to suggest that drying out may not clear up this disease.

In the September issue of *The Aquarist*, I mentioned the damage done by "Teddy-boys" to my polythene pond and how I had to "board" the fishes in the bath for the time being. On the same day that the issue appeared an enthusiast in Manchester wrote to me, not only expressing his regret but offering to board-out any of my fishes. This gentleman was quite unknown to me and I was particularly touched by the speed of his offer. I did not need to avail myself of his facilities as, by this time, my pond had been repaired and was in full use again, but he was not to know that. As soon as I could I took the opportunity to call on him and found him a coldwater-fish enthusiast with no hankering whatever for tropicals. His second-hand greenhouse was obtained for £5, and houses several tanks and a 6-ft. pool. In addition he has four 40-gallon steel tanks, concreted inside, in the garden. At the time of my visit most of his tanks and pools held *Daphnia*. He told me that he originally came from Leicester, where he found coldwater fishkeeping much more popular, and he feels like a fish out of water in Manchester where there is no interest whatever in the coldwater side of the hobby. He feels very out of it and cannot understand the lack of interest in the north, where everybody is solid for tropicals.

I know that this is true; coldwater fishes of any real quality are almost unobtainable in the north and seem likely to remain so. My correspondent would like to meet other coldwater-fish enthusiasts in the south Manchester area, and I will pass on his address to anyone interested. It seems that he did go along to a local fish club but found no welcome whatever, and soon dropped out. Tropical fanciers are rarely coldwater-fish-minded, and vice versa. Couldn't an area like Manchester, with a population of 3 millions within a 10 miles radius, support a coldwater fishkeepers' club? Perhaps someone will take this up.

Mercurochrome is deadly to white spot but unfortunately, it has a bad effect on some plants also. This is a great drawback, because if a tank is to be dosed with this drug it means that some plants will be set back very considerably. Two of the plants most affected are *Aponogeton* and *Gabomba*. *Aponogeton* does not die but all the existing leaves will shrivel up and it will be necessary to cut them off in a few days. The fine long leaves curl up both ways, i.e., bilaterally, so that the effect soon becomes that of an ostrich feather. Long experience shows that it is only the leaves which suffer, and the plant will live for years, sending up fresh leaves once the chemical has been removed or very considerably diluted. *Gabomba* is also put back, the fan-like leaves curling up at the edges so that a chrysanthemum curled-petal effect is given. This has interest at first but in time it looks like what it is, the unwelcome effect of mercurochrome.

Strangely enough, my experience is that *Gabomba* which has been exposed to mercurochrome often flowers within a day or two of the introduction of the chemical.

When fishes die one can dispose of them in various ways or one can pickle them in a preservative if need be. However, some very hard, bony fishes can be dried out in the sun. I saw some recently which had been allowed to dry out under glass and the effect was perfect. This can be done with catfishes, *Plecotomus*, box fish, etc., in fact, with any fish with a hard and bony exterior.

I have met many aquarists who do not restrict their pet-keeping to fishes. A dog, cat or bird seems to be the general rule and these pets are quite divorced from the aquatic ones, which is just as well. For myself, I have never owned a cat and after so long without I doubt if I shall weaken now. Dogs have also been absent from our house for the last 45 years but we have had several cage birds over the years. Do not think, however, that I am restricted to keeping fishes. Only the other day I had to draw up a list of my pets during the year and was quite startled to find how extensive this was. The list includes ten hamsters, one tortoise, one guinea pig, five rabbits, two terrapins, a grass snake, a dice snake, a hedgehog, dozens of mice of all colours, numerous newts, frogs, toads, water beetles and spiders and many lesser creatures. Fortunately, these do not have to be kept at home, which has been graced only by tropical and coldwater fishes, snakes and terrapins. The more one sees of these other pets the more the realisation dawns that fishkeeping is easily the least trouble. Most pets try to escape and some have to be very carefully caged (like snakes), but fishes stay put. Mice can be very odoriferous if not kept clean regularly. Hamsters use their teeth on their cage and can make enormous holes in woodwork or even in a wooden floor. Rabbits and guinea pigs need room and exercise and hedgehogs carry with them many unwelcome guests. I constructed a form of vivarium which we called "The Frogger," and this contained a rockery and a pool section. This looked ideal but it required very frequent cleaning owing to its large and mixed population.

The attitude of visitors differs. With fishes they are usually interested and polite, but reptiles, insects, rodents and spiders are not favourably received by one and all. It is surprising how many people do not know what a hamster is. Snakes are guaranteed to upset most casual visitors although children rarely show any fear—on the contrary they are only too anxious to handle them. Few people know how to handle unusual pets (or don't wish to do so) and are downright cruel in their handling of rabbits, guinea pigs and tortoises. One advantage of keeping fishes is that you can forget about feeding them for several days if necessary and all will be well. Most pets cannot be overlooked and the very tiny animals like mice and birds must have food constantly available. Snakes can be very difficult. Finding suitable food for snakes in urban areas is never easy, but even when it is found snakes will ignore it. My dice snake was very choosy and on one occasion seven small frogs introduced as food all died eventually by drowning in the snake's bath. Fishes cause little heart-break when they pass on, unless they are very rare specimens. On the other hand a gloom settles on the house when the cat, dog, canary or budgie dies.

A new set of stamps issued by Poland are based on the fishing industry and show pike, 2.10 blue, zander, 40 turquoise, and salmon, 60 green. For collectors these retail at 6d. per set used.

The Garden Pond in November *by* ASTILBES

THIS month the garden pond must receive some attention extra to that which has been necessary during the year. Whether the pond will have to be emptied and cleaned out or thoroughly overhauled will depend upon whether the pond is small enough to tackle and also on the type of planting which was used when the pond was first made. Any pond will have collected a great deal of mulm and decaying leaves during the late summer and if too much of this is left in the pond for the winter the result may be dangerous to the inhabitants of the pond.

By this time most of the leaves will have fallen from the trees and shrubs and so if the pond is cleaned out now there is little possibility of it becoming fouled again for a long time. Although a few decaying leaves may be beneficial to the water plants it is no use allowing excess to remain in the pond all through the winter. If this happens it is certain that there will be some pollution and the water may become unsafe for the fishes. Such plants as water lilies can do with some decaying vegetation in the form of manure, but as they are quite inactive all the winter it is quite unnecessary to give any form of fertiliser until the late spring. Water lilies will themselves provide plenty of decaying material and even this can be too much for a small pond. If the pond has been almost covered with lily leaves for the summer the amount of decaying matter resulting can soon make the water smell. That is why it is a good policy to remove most of the lily leaves and dead flowers before they cause too much pollution.

Cleaning out the Pond

If a fairly small pond is not cleaned out it is possible for at least a couple of inches of mulm to form at the bottom each

year, and if some of this is not cleared out the pond will become gradually more shallow and the amount of mulm can become a nuisance. If the pond is a concrete one and there is no compost on the bottom, then it is a fairly easy task to clean it out.

This is when the advantage of having planted in removable containers pays dividends, as it is a simple matter to slide these containers up the side of the pond and on to the edge when cleaning operations are under way. If, on the other hand, the pond was given a good layer of loam or other compost on the bottom then the roots of the water plants will have become embedded firmly in this and the possibility of making a thorough job of the cleaning will be remote.

For the small pond with removable plant containers the procedure should be as follows. Try to choose a dry day well into November. Often we get several bright days about the middle of the month. If you have a stopper in the base of the pond this can be removed first thing in the morning to start the emptying. If not there are several methods of getting rid of the water. If the pond is at a higher level than a part of the garden then much of the water can be siphoned out with a hose pipe. The remainder will have to be thrown out with a bucket. If one of the small electric pumps is used it is possible to remove nearly all of the water with little trouble. When using the latter method see that the emptying nozzle is not pushed down so far into the pond that the mulm or weed clogs up the opening. The nozzle should have a perforated trap to prevent its being choked, but even this will not stop blanket weed and other fine plant life from stopping the flow of water.

If an electric pump is being used it is a good idea to start



Photo:

Pontederia caudata is a plant of the pond shallows which usually needs drastic pruning when the annual cleaning out is done

Laurence E. Perkins

the pump working before breakfast, so that much of the water can be emptied out before the actual cleaning begins. Do not try to catch the fishes until most of the water has been removed. If you do it is probable that you will stir up a great amount of mulm, which will soon cloud the water so much that the fishes cannot be seen. As the water level is lowered the plant containers will be seen and can be removed. If these have large water lilies in them they can be very heavy, but with the aid of a rake they can be drawn up the side of the pond and left clear of the edge. They will come to no harm for most of a day if left there but if the weather should be very bright then a damp sack can be placed over them to prevent undue drying out. See that you have a good-sized container for the fishes and also see that this is not placed in the sun. If a fairly large bath is used and covered up in the shade the fishes should be quite safe. Take a look now and again to see that they are all right. If some of them are large they can soon be in trouble if left in crowded conditions, especially if the water gets a bit warm. It may be necessary to change some of the water once or twice but it depends on the number of fishes and their size.

When all of the fishes have been caught and the water plants removed a pair of gum-boots should be donned, and then it will be possible to clear out the pailfuls of black smelly mulm which is sure to have formed at the bottom of the pond. This can be scooped up best with an old milk saucepan. Be careful to make sure that any small fishes are not embedded in the mulm; it is surprising how they will bury themselves in this as soon as the pond is disturbed. Once the majority of the mulm has been removed the hose can be used to wash round the sides and a stiff broom will soon get everything sweet and clean. If there is any blanket weed adhering to the sides of the pond this can be pulled off now, and any attached to the water plant containers can also be cleared just before they are returned to the pond. The presence of some of this weed will prevent the containers from drying out too quickly when the pond is being cleaned.

Repairs to Concrete

Any cracks in the pond can be dealt with now. Large ones are best raked out to remove any loose material and then they can be filled with a mixture of 1 part of cement to 1 part of clean fairly sharp sand. Fine sand only must be used so that the compost remains fine enough to be forced well into the crack. If quick-drying cement is used it is possible to make the repair and fill the pond the same day. Any small cracks in the concrete will show up very plainly once the pond starts to dry. Small ones can be repaired with one of the plastic compounds, forced into the crack and rubbed well in by placing a piece of grease-proof paper over and applying pressure with the fingers. If nothing is laid over the material it will stick to the fingers and become almost impossible to keep in the crack; the paper can be left on the substance, it will float away at some future time.

If any types of bitumastic material are used for this repairing it is essential to see that the crack is quite dry or else the compound will not adhere. It is waterproof and so it cannot be expected to stick to anything wet. It may be found that in a pond where there is a crack, once the pond is emptied water will seep back through the crack. It will be necessary to see that this stops before any attempt is made to repair with any of the bitumastic compounds. The use of a blow lamp will be helpful if it is intended to get the task finished in a day.

Once the pond has been cleaned well and any necessary repairs are carried out the pond can be refilled. Do not let the water pour from the hose on to freshly repaired spots. Once you have about one-third of the depth of the pond filled, the plant containers can be lowered back into the water. Some of the containers may have lost most of their

soil and these should have attention whilst the pond is filling up. Some fresh loam (grass turves are very good for this) should be forced into the container and some large stones placed on top to see that the soil is not likely to be removed easily by the fishes. With the water lilies it is a good plan to tie the root stocks down to the pots with some polythene cord, bringing some over the top of the rootstock to prevent the whole plant from rising to the surface once many leaves grow in the spring.

Once the water plants are back in position the fishes can be dealt with. Examine them before replacing them in the pond. Ensure that there are no fish lice or leeches on them. Sort out any fishes which you do not need any more, such as goldfish which have not changed colour or even a catfish which has grown too large for the other occupants to remain safe from being eaten.

The method of dealing with any youngsters of the season's breeding is a matter for the pondkeeper to decide. As long as there will be enough cover in the pond there is no reason at all why the fry should not be left there. It is probable that more young fish are lost each year by being taken from the pond and kept in small containers than if they had been left to take their chance in the pond. Even very small fishes can go through the winter quite safely as long as the water remains pure. If good-class fancy varieties of goldfish are kept in the pond it is essential to see that no fry which have bad faults are left in the pond, for these might be passed on when breeding in future years.

Once the fishes are back, the top of the water may be netted to remove any loose fragments of weed, etc., and the edges of the pond can be tidied up.

The advantages of cleaning out the small pond at this time of the year are enormous, and the water in the pond will keep much purer all the winter than it would have if the pond had not been emptied. It is when ice forms over foul water that the fishes are poisoned by foul gases trapped beneath, so the cleaner the water and the less decaying material there is in the pond the safer will the fishes be.

With the natural type of pond it can be a problem to make much of a job of cleaning at this time of the year. The larger the pond the longer will it be able to function without some drastic action on the part of the pondkeeper. This is when those who have made their pond and placed a large quantity of compost at the bottom begin to wish that they had not done so. It is no easy task to clean out such a pond thoroughly, but all that can be done must be accomplished from the side with the aid of a rake and nets. Remove as many as possible of the leaves which have fallen into the pond, together with some of the mulm which is near enough to be moved. The water will become cloudy, but if the hose is kept on whilst the cleaning is taking place the fishes will come to no harm. If the water does not look in good condition then remove most of it, but be careful to see that enough is left for swimming space for the fishes. When fresh water is run in see that it runs into a bucket placed temporarily in the pond to prevent undue disturbance.

Cacti in the Fish House

WATERING of most cacti and other succulents should be decreased gradually this month. The cooler the position where the plants are kept the drier most they be. In the fish house, where there may be some warmth, it will be advisable to give a little water about once a month. The plants should rest during the winter and they will then flower better the following year. Lightly fork over the surface of the soil in all the pots and see that all weeds and pests are removed. See that the plants are in as light a position as possible.

our readers

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



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

"Two to One Against"

YOUR correspondent, J. L. Kelly, appears to be jumping to conclusions when he writes about the showing of pairs of fishes in the September issue.

Only pairs of fishes have been shown at the British Aquarists' Festival for the past 3 years, not single as stated. During this period by far and away the majority of club open shows staged by member societies of the F.N.A.S. have been for single fish and this applies also to the club table shows that I have knowledge of. I fail to see therefore why the fact that the F.N.A.S. have decided to exchange single fish classes for classes which have previously been for pairs, should immediately cause someone to conclude that single fish classes were unlikely to be staged in all other future shows.

My own Society voted in favour of having pairs of fishes only at the B.A.F. this year, but we still intend to have single fish classes at our own show next year and also at our monthly table shows. The only reasonable arguments in favour of single fish classes are that there would be more entries and the standard would probably be a little higher. It would be advisable to heed these arguments in respect of the smaller shows, where the "pairs only" stipulation would be a limiting factor in the number of entries, but surely there should not be this trouble at such large-scale shows as the B.A.F. and Midlands Show.

One point put forward in favour of single fishes is the activity occasioned by putting pairs together. Surely this is most desirable. Some fishes look most drab and uninteresting when separated from their mates and the majority are improved some way or other—to say nothing of the tank as a whole.

I do not quite understand why the term "amateur" is used but it is ridiculous to suppose that just because someone has only one tank and can turn out champion single fish he cannot do the same for pairs.

Of course we all know how comparatively easy it is to obtain the odd "super-fish" from time to time if money is no object—but how easy is it to buy comparable pairs? This should at least help to ensure that the fishes have been reared to some extent by the exhibitor.

An effort is being made to make these larger shows more attractive to aquarists and public alike by making full use of the support available—it remains to be seen whether or not this is a success.

B. T. ROE,
Liverpool, 15.

ALTHOUGH I have little doubt but that Mr. Kelly wrote his "Two to One" article with his tongue in his

check it should be commented upon if only to rectify the many inaccuracies. The result of the poll was 16½ for single fish, 16½ for pairs and 66½ showed by their silence to be quite indifferent. The source of my information is, of course, the best. At all the B.A. Festivals and most other big northern shows, pairs have been the general rule in the past, so that contrary to Mr. Kelly's statement, the "pairs" ruling if and where applied is not a departure into something new. As there is no new ruling of this nature it follows that the amateur will still carry off the "pots" as heretofore.

Mr. Kelly refers to "the powers that be," an all-too-common form of blaming those who are, in fact, generally a handful of hobbyists carrying out the expressed majority wishes of the Kellys, the Jones and the Smiths, not to mention the Robertsons.

If Mr. Kelly is serious then it appears to me that he would like to see competitions so levelled down that the ignorant and lazy will be prize-winners. Only if effort is called for is anything worthwhile and the greater the former the greater the satisfaction.

As I have no modesty I can claim, as an example, to have carried off not a few first-class awards, and with pairs and sets of pairs, not once but on every occasion on which I have taken the trouble. I do not seek publicity so, Mr. Editor, may I sign myself:

"ONE OF THE AMATEURS."
Yorks.

East London's Show

MAY we, through your columns and on behalf of our club, thank the many aquarists who supported our recent successful Show, and at the same time answer the often-asked question, "Why don't you make your Show open?"

It always has been and still is the policy of the E.L.A. and P.A. to encourage the genuine aquarist, and we feel that a person who can set up a furnished aquarium or can breed fishes is such a person; therefore we make these classes open. There are people who pay high prices for good adult fishes just so that they can enter them in shows and win prizes; it is for this reason that we keep the other fish classes for our members only, who we believe, are all good aquarists. We do, of course, realise that there are aquarists who have bred and reared fishes that they are justifiably proud to enter in a show, and wish it were possible to accept their entries. We do sincerely apologise to these aquarists for keeping most of our show "closed," but what the future will bring we do not know. That is a

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matter for future committees to decide. It is fairly safe to say that furnished aquarium, breeding and plant classes will be open and that all aquarists will be welcome.

In conclusion, may we say that we prefer to see a fish that has a standard wearing the "Best Fish of the Show" ticket, and not an expensive rarity for which there is no standard by which it may be judged.

F. A. PETTO,
Secretary, The East London Aquarists and
Pondkeepers Association.

Public Aquariums

WHILST not wishing to enter into any lengthy exchange of correspondence with Mr. Sinclair, I would appreciate the opportunity to answer his letter published in the September issue.

Firstly, my authority to dispense praise and blame with regard to the hobby is, I believe, justly established in my being able to claim 14 years' experience with a great many different varieties of fishes. I have successfully bred a good few of these and kept them in good health for a reasonable length of time.

Secondly, I did not mean to infer that I expected to see fishes of prize-winning quality in Torquay Aquarium. What I did criticise was the health and condition of those fishes on view. If, in fact, as Mr. Sinclair claims, the fishes at present in his Aquarium are the same specimens as those which I saw in June and if they now satisfy his inspection I can only assume that either they have made a truly remarkable recovery or that Mr. Sinclair's standards of judgment are not all that they might be.

MAX GIBBS,
Oxford.

Erratum

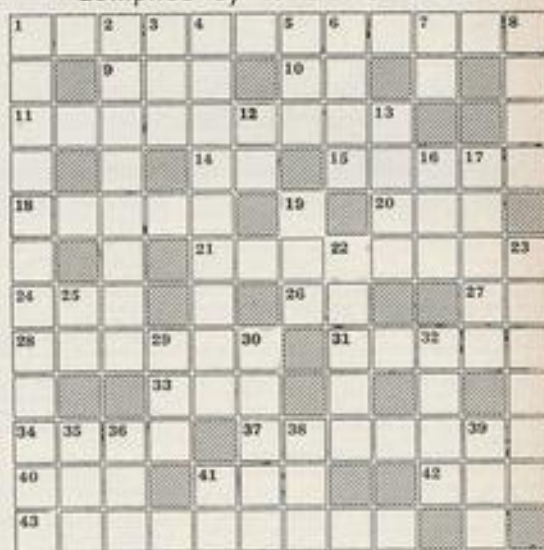
It is regretted that the scientific name of the dwarf gourami pictured on page 146 of our October issue was incorrectly given; this should be *Colisa lalia*.



"And I can show you something which proves how keen the fish are on this new food"

The AQUARIST Crossword

Compiled by J. LAUGHLAND



CLUES ACROSS

1. Fishes with poison spines (6, 6)
2. To give over, broken line will give it (3)
3. In short, his decision is usually final (2)
4. Genus - 10 - which belong weaver fishes (9)
5. This means you! (2)
6. Weapon from which *Xiphophorus* is named (5)
7. Turf again (5)
8. Salute from the end of the wave (3)
9. *Barbus conchatus* (4, 4)
10. Measure of electrical resistance (3)
11. To (2)
12. This is that is (1, 1)
13. As Cuba produces a counting frame (6)
14. This proverbially is the answer, but it could be a sole (5)
15. River of S. Wales (3)
16. One of a breeding pair (4)
17. Opposite of presence (7)
18. Khan who is head of the Moslems (3)
19. Mated but for the doctor. Consumed (3)
20. Sire (3)
21. *Hypostomus* (4, 5)

CLUES DOWN

1. Corixidae (5, 7)
2. Genus of sunfishes (4)
3. Odd this for people's theatre (3)
4. Containing water (9)
5. Marsh (3)
6. *Loricaria* this is the orfe (4)
7. Male in a way (2)
8. *Aloes*
9. See 27 Across (1, 1)
10. Mop (4)
11. Egg cells (3)
12. One of the danios (5)
13. Is in Latin (3)
14. Vitella of seeds (5)
15. Bowed (6)
16. Grade of blacklead pencil (1, 1)
17. Hint (3)
18. Common flatfish, Kane's in a way (5)
19. Repair a thousand before the end (4)
20. Period of time (3)
21. Chinese philosopher (3)
22. Siamese do this on *Betta* without a thank you (3)
23. Has this fish nine lives? (3)
24. You are looking at the answer! (2)

PICK YOUR ANSWER

1. Which one of the following well-known ichthyologists met his death by drowning? (a) Agassiz. (b) Artedi. (c) Bleeker. (d) Bloch.
2. *Sphaerichthys sphaerocaudata* (the chocolate gourami) was named by: (a) Canestrini. (b) Day. (c) Hamilton-Buchanan. (d) Pfeffer.
3. *Apoistogrammus rufireas* is native to: (a) Argentina. (b) Bolivia. (c) Ecuador. (d) Venezuela.
4. The Cuban cichlid is the popular name of: (a) *Cichlasoma coryphaenoides*. (b) *Cichlasoma fasciatum*. (c) *Cichlasoma tetraodon*. (d) *Cichlasoma sphenothalmus*.
5. *Pistia* (water lettuce) is represented by: (a) one species; (b) two species; (c) four species; (d) eight species.
6. The flower of *Myriophyllum proserpinacoides* (parrot's feather) is: (a) Blue. (b) Red. (c) White. (d) Yellow.

G. F. H.

(Solutions on page 181)

News

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.

THE third annual Film Convention of the **Hendon and District Aquatic Society** was held recently and the occasion was a great success, attracting 800 aquarists from all parts of the country to see a programme of colour films provided by Messrs. Carels and Wance of Ghent, Belgium. The technical standard of the films was superb and an amusing commentary was given by Mr. Carels to the great delight of the audience.

The first half of the programme consisted of two films depicting very many species of tropical aquarium fish and was entitled "Aquarium Jewels." After the interval, a sheet film of the Hendon Society's visit to Ghent in July this year was shown and the film was subsequently presented to the Society by Mr. Carels. This was followed by a delightful film about mice, and the programme ended with a magnificent display of marine beauties.

The Society also entertained a party of 11 Belgian visitors from the Nymphae Society of Ghent, who were invited for a return visit after Hendon's earlier stay with them. Their arrival was followed by a party in the evening to celebrate Hendon's 50th meeting.

The Hendon Society has now been in existence for 10 years and holds weekly meetings. It is of interest to note that seven of the original 10 are still members of the Club.

THE Study A.P.K.C. Exhibition at Powers-Samas was held on the stage of the canteen at the Powers-Samas works in Aurelia Road, Thornton Heath, during the works' own Handicraft Exhibition. Fourteen tanks showing tropical and coldwater fish were shown, ranging from Guppies to Orandas.

Over 3,000 people visited the section and various questions were answered regarding the keeping of fish and visitors' own pets' ailments, etc. Many people returned to the section two or three times and new members were obtained for the Club.

RECENT meetings of the **Sheffield and District A.S.** have included a visit from Mr. W. L. Mandeville and a talk and slide show on Garden Ponds by one of the members. The Table Show for October was for Cichlids and Gouramis and for November, A.O.V. Tropical. During October a Breeders' Class Show was held and a Cup presented to the winner. This has been revived after a number of years and it is hoped to make it an annual event in future.

A **VELIFERA** Mollie, exhibited by Mr. J. G. Flintham, won the "Alaswoth Shield" for the best fish in the show, at a recent inter-club show for the Riverside Challenge Trophy. Results of this show were as follows: 1st, Riverside A.S.; 2nd, Uxbridge A.S.; 3rd, Southall A.S.

Details of membership can be obtained from the secretary, L. Taggart (Riverside Aquarium Society), 39, St. Dunstons Road, London, W.6.

THE annual breeders show of the **Catford A.S.** was held recently when members exhibited 36 teams of fish of top quality. Many good teams of Aphyosemonis, Ramirezii and Glowlights were shown. One member, Mr. W. Ryan, showed 10 exhibits which only goes to show that not only are we fishkeepers but know how to breed them as well.

A new idea was tried out this year when egg-layers were split into two classes. One for fish that qualify for 10-14 points for difficulty of

breeding, and the other for 15-20. Livebearers also had a class to themselves, the best team of the three classes winning the Breeders Cup which this year went to Mr. W. Ryan for his team of Glowlights. Winners of the other two classes were Mr. H. Barlow, with a team of Pearl Danios, and Mr. R. Coombes with a team of Mosquito fish. Mr. Blunt, of the A.S.L.A.S. panel of judges, judged the exhibits.

Any local aquarist will find a hearty welcome extended to them if they care to visit the Catford Club on any Monday evening at 8 p.m., in the Lewisham Mens' Institute, Holbeach Road School. The programme for the coming season includes many lectures by top-grade judges and aquarists whose names are household words in this hobby.

ARRANGEMENTS have been made by **Birkenhead and District A. and H.S.** to meet twice monthly. The last two meetings have consisted of a question and answer session for newcomers, queries being ably answered by Messrs. Tomlinson and Williams, and a quiz between members, set by the secretary. Results were: T. B. Johnston, 27½ points; J. Paulkner, 26½ points; M. Holland 24½ points.

AN illustrated talk will be given by Mr. W. E. Covey on the Chemistry of Water in relation to Fishkeeping, on the 12th November, to the **Guildford and District Aquarists' Club**. The Club Bulletin also contains some notes on the breeding and rearing of Black Angels, which were the subject of a talk by Mr. C. A. Allan of the North Hants Aquarists' Club.



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. together with the **Aquarist's Badge Token cut from page viii**, to Aquarist's Badge, *The Aquarist*, The Butts, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

THE THREE COUNTIES AQUARIST SHOW

THE full results for the above Show were as follows: Best Fish in Show: R. Luff (East Molesey). Best Coldwater Fish: H. V. Jenkins (Barry, Glam.). Best Tropical Fish: R. Luff. Inter-club Furnished Tank Competition—Tropical: 1, High Wycombe; 2, Portsmouth; 3, Rainingslake. Inter-club Furnished Tank Competition—Coldwater: 1, High Wycombe; 2, Reading; 3, Portsmouth. Individual Furnished Tank Competition—Tropical: 1, F. H. Watts; 2, R. D. S. Deeks; 3, E. J. Pitts. Individual Furnished Tank Competition—Coldwater: 1, R. Forest-Jones; 2, J. S. Bird. Goldfish: 1 and 3, E. H. Chatfield; 2, D. Nicholls. Shubunkins: 1, H. V. Jenkins; 2, J. S. Bird; 3, R. Forest-Jones. Moors: 1 and 2, M. G. Gibbs; 3, H. V. Jenkins. Other Varieties Coldwater Fish: 1, M. G. Gibbs; 2, E. H. Chatfield; 3, R. Forest-Jones. Swordtails: 1, E. H. Chatfield; 2, Mr. and Mrs. Scott Morgan; 3, Mr. and Mrs. Scott Morgan. Planies: 1, R. Keeping; 2, P. H. Watts; 3, C. E. Sprinks. Best Livebearers—Mollies: 1, H. G. Rundle; 2, D. L. Edmonds; 3, E. G. Partridge. Guppies: 1, R. Forest-Jones; 2 and 3, R. Keeping. Characins: 1, R. Luff; 2, F. H. Watts; 3, H. G. Rundle. Barb: 1, H. G. Rundle; 2, Mr. and Mrs. Turtle; 3, D. E. King. Minnows and Danios: 1, E. G. Partridge; 2, V. P. Voysey; 3, W. J. Eccles. Rasboras: 1, H. G. Rundle; 2, D. E. King; 3, C. E. Sprinks. Fighters: 1, R. Forest-Jones; 2 and 3, Mr. and Mrs. Scott Morgan. Best in Show—Labyrinths: 1 and 2, R. Luff; 3, R. Forest-Jones. Dwarf Cichlids: 1, 2 and 3, R. Keeping. Cichlids: 1, C. J. Lecke; 2, K. H. Palmer; 3, Mr. and Mrs. Scott Morgan. Catfish: 1, V. P. Voysey; 2, K. L. Poole; 3, D. L. Edmonds. Other Varieties Tropical Fish: 1, A. C. Weller; 2, S. Frayne; 3, Mr. and Mrs. Scott Morgan. Breeders—Coldwater: 1 and 2, H. V. Jenkins. Tropical Livebearers: 1, F. H. Watts; 2, H. G. Rundle; 3, R. Forest-Jones. Best Breeders Exhibit—Tropical Egglayers: 1, R. Keeping; 2, Mr. and Mrs. Turtle; 3, W. J. Eccles. Aquarium Plants: 1, S. Frayne; 2, A. C. Weller; 3, D. E. King.

THE first meeting of the new season of the **Rolls Royce Aquarium Club** was held recently when Dr. Young of the Scottish Aquarium Society spoke on the subject "Pond Life."

The annual general meeting was held on 1st October, when the membership stood at 34, which compares favourably with the starting figure of 20, when the club was formed in 1957. The next meeting is on 5th November, when Mr. D. O. Carr of the Greenock A.S. will be giving a talk on "Reptiles and Amphibia," and any aquarists outside the club are welcome to come along and hear this most interesting speaker.

A film show has been arranged for Friday, 28th November, at 7.30 p.m., when a variety of films, of particular interest to aquarists and anglers, will be exhibited. The show will last for three hours and refreshments will be provided during the interval, all visitors are welcome to attend and the programme details will be sent to other clubs in this area.

AT the annual general meeting of the **Surrey Aquarists' Circle**, Messrs R. G. Mealand and C. Parslow were unanimously re-elected president and chairman respectively. Both congratulated this small society on a highly successful year—due mainly to the team spirit of the members—a factor which enabled the Society to win the A.S.L.A.S. Trophy for 1958.

Mr. R. Luff was congratulated on his success at the September Three Counties Show, where he secured awards, amongst others, for the Best Fish in the Show, Best Tropical Fish in the Show, and Best Characin in the Show.

AT the annual general meeting of the **Mitcham and District Aquarists' Club** the following members were elected to office. Chairman, Mr. W. A. Dickinson; secretary, Mr. H. Ball, 126, Kingsbridge Road, Morden, Surrey; treasurer, Mrs. B. M. Dickinson; show secretary, Mr. R. Hall.



Photos: J. L. M. Judge

British Aquarists Study Society Conference

A HIGHLY successful annual conference of the British Aquarists Study Society was held at the London Zoo last month. The programme extended from the morning to evening, with business meeting, illustrated talks, an "Any Aquatic Questions" panel and a private view of the Zoo Aquarium, after dinner, as highlights of the day for members and guests.

The conference was opened by the first B.A.S.S. president, Mr. R. G. Misland. In his welcome to the guests Dr. A. Pearlman, chairman, pointed out that the meeting was not to be associated with an "annual general meeting", but that it was an informal gathering of friendly aquarists. Mr. J. E. Edwards, organising secretary, in his report recalled that 2 years ago he had founded the B.A.S.S. and its first (which was largely the same as the present) committee. One of the tasks of the coming year, he said, would be to formulate a proper constitution for the Society, in which Mr. Edwards thought that he had for so long played the part of "dictator". This period without elected committees had, however, been agreed upon at the outset so that the Society should build a firm foundation. He thought that a matter of future concern would be to safeguard the present "good fellowship" of the B.A.S.S.; the Society was not interested in competitive aquarium shows or in providing

lecturers or judges, but aimed at being a society of active individual members, all with the interests of an aquarist's fellowship at heart. For this reason membership was by invitation only, total membership being limited to 200 and a maximum intake of 25 new members annually. Seven new members were enrolled in the past 12 months.

The new badge of the B.A.S.S. was introduced at the conference. The president of the Society for 1958-1959 was announced to be Dr. F. N. Ghadially, an early member of the Society and its technical adviser. After a talk by Mr. Colin Roe of Shirley Aquatics the audience was able to inspect some unusual water plants the speaker had brought with him. Dr. Ghadially gave a talk about his new fish house. A distinguished panel provided the answers to questions put by the audience after tea; members of the panel were Dr. F. N. Ghadially, Dr. Gwynne Vevers (curator of the London Zoo Aquarium), Dr. J. Cloudsley-Thompson, Mr. Colin Roe and Mr. D. McInerney, all members of the B.A.S.S. Dr. Gwynne Vevers conducted those attending the conference around the Aquarium in the evening, and he was asked to accept the thanks of the B.A.S.S. to the Zoological Society of London for allowing the Society to meet at Regent's Park.

Photographs taken at the B.A.S.S. conference. In the group on the left are seen (left to right) Mr. H. Russell Holland, Mr. W. L. Mandeville, Mr. J. E. Edwards and Mr. C. D. Roe. Forming the aquatic quiz panel at the table are (left to right) Mr. D. McInerney, Dr. F. N. Ghadially, Mr. C. D. Roe, Dr. Gwynne Vevers and Dr. J. Cloudsley-Thompson. A group of B.A.S.S. members is seen in discussion in the second picture from the right, and the right-hand picture shows the chairman Dr. A. Pearlman (left) welcoming Dr. F. N. Ghadially as the Society's new president.

The main event of the programme consisted of a film show featuring "Queer Fish," a conducted tour of the London Zoo aquarium and "The Silent World," which dealt with man's achievements to date in breaking down the barrier to underwater exploration. Before the film show the last of the present series of Carris Cup table show competitions was held, when obtaining a first in both Cichlid and Coldwater classes the society's chairman, Mr. C. E. Jenkins, proved a worthy and popular winner.

The final placings in points aggregates in the competition during the year were: 1, C. E. Jenkins; 2, H. Bird.

SECRETARY CHANGES

CHANGES of secretaries and addresses have been reported from the following societies: Canterbury and District Aquarists' Society (Mr. G. Marsh, 9, Beaconfield Road, Canterbury, Kent); Glenrothes and District Aquarist Society (Mr. W. Stanners, 40, Queen Margaret Drive, Glenrothes, Fife); North of Scotland Aquarist Society (Mr. H. Wetherby, Jr., 17, Aboyne Gardens, Kainhill, Aberdeen).

News from Aquarists' Societies—Continued.

THE Brockley and District Breeders Circle only competitive Table Show of the year—the Breeders Class—was recently won by a junior member, Michael Thomas, who exhibited Blue Fighters. A close second were some very good Mosquitoes.

The present series of table shows are devoted to one species of fish only and a new series, starting shortly, will be devoted to one member only. One-man shows of a non-competitive nature are an entirely new feature for the group and it is hoped that much information concerning individual methods of fishkeeping will emerge.

PRIZEWINNERS in the table show for acanthids held at the monthly meeting of the **Northampton and District Aquarists' Society** were: 1, Mr. D. E. Butlin; 2 and 4, Mr. J. Stead; 3, Master P. Daley. A talk on "The Sense Organs of the Fish" was given by Mr. D. E. Jones of Corby A.S.

Prize-winners in the Home Aquaria Competition were: Tropical: 1, Mr. W. H. Snedker; 2, Mr. G. Pulley; 3, Mr. N. E. Lyon. Coldwater: 1, Mr. W. H. Snedker; 2, Mr. J. A. Catterall; 3, Mr. T. Dascombe.

RESULTS of the third leg of the **North-West London Group of Aquarists' Societies** contest, held at Independent A.S., were as follows: 1, F. Keen (Willesden); 2, L. G. Lawrence (Hampstead); 3, Miss B. Gerkin (Willesden). Fancy Goldfish: 1, S. Wingrove (Willesden); 2, W. L. Wilson (Harrow); 3, Mrs. Joyce (Independent). Substrains: 1, F. Keen (Willesden); 2, G. King (Hendon); 3, F. Tomkins (Independent). British Native and Foreign Coldwater: 1, R. Parter (Willesden);

2, G. King (Hendon); 3, F. Keen (Willesden). Total points to date are: Willesden 47 points; Hendon 31 points; Independent 23 points; Arnold 8 points; Harrow 7 points; Hampstead 4 points.

AMONG the activities of the **Dunstable and District Aquarists' Society** recently was a Table Show for Tropical Plants. The speaker was Mr. Katrietzky, who gave an illustrated talk. A Novices Table Show has also been held.

THE new meeting place of **Arnold Aquarists** is Preston Park School, College Road, Wembley, where the club meets on the second Tuesday of each month. Exhibitions have been arranged recently at the Wembley Food and Floral Show and also the Wembley Exhibition, organised by the Council. The 4th November will see the club as hosts to the North-West London Group of Aquarist Societies at the new meeting place mentioned above. There is usually a good show of fish at these meetings, and all aquarists are welcomed to come along. The hon. secretary is Mr. W. Green, 57, Crabtree Avenue, Wembley, Middlesex.

RECENT activities of the **Aylesbury Aqualife Association** included a talk by Mr. Lanwoon, Overseer of the Reptile House at the London Zoo. Numerous specimens were shown and the lecture was greatly appreciated by the good attendance. The annual dinner is on Saturday the 13th December.

THE first of the autumn series of meetings of the **Nuneaton A.S.** was held recently, when over 30 enthusiasts of the hobby were present including a sizeable contingent from the Coventry society.

Crossword Solution

W	E	E	V	E	R	F	I	S	H	E	S
A	L	I	N	E	D	E	H				
T	R	A	C	H	I	N	U	S		A	
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R	E	S	O	D	E	A	V	E			
B	O	R	O	S	Y	B	A	R	B		
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