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<th>Framed</th>
<th>Aquariums</th>
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<td>Water Orchis</td>
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<tr>
<th>TROPICALS</th>
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<tr>
<td>No. 1 30 plants including</td>
<td>Dwarf Lily Cryptocoryne Wateri etc.</td>
<td>£1</td>
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<td>No. 2 12 Valliseria</td>
<td>12 Myriophyllum</td>
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<td>No. 3 12 12 Vesuvius</td>
<td>3 Micro Sagittaria</td>
<td>6 Ludwigia</td>
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<td>No. 9 6 Vesuvius</td>
<td>6 Myriophyllum</td>
<td>6 Ludwigia</td>
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Synodontis alberti
by JACK HEMS

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native of the Stanley Pool area of the Congo, was
first made available to tropical aquarists in 1954,
and is not as widely known as it should be. It belongs
to a fairly large genus of African fishes of the family
Mochokidae, a few of which habitually, or almost habitually,
swim around with the belly upwards. On account
of this most unusual habit, they are popularly referred to
as upside-down catfishes. The subject of this short note,
however, swims in a perfectly normal manner.

Externally the most distinctive features of S. alberti
are a heavily built body, broader and deeper anteriorly
than posteriorly, the absence of scales, six long barbels
at the mouth, a tall dorsal fin supported by a strong fore
spine, a short-based anal fin, and a long-based adipose
fin. The colour is a charming soft lilac to lavender grey,
lightening somewhat on the underparts. As a rule, not
fewer than nine bold black spots adorn the sides. Black
spots are also present in the dorsal, adipose and caudal
fins. The lustrous black eyes are rimmed with gold
tinged with silver, or perhaps it is the other way around.

A young specimen—fully-grown the species attains just
over 6 in. in length, and at this size needs a tank to itself.

Please turn to page 156.
Metamorphic

by H. J. Vosper

(Photographs by the author)

In the two preceding articles were discussed the igneous rocks and the formations derived therefrom by mechanical breakdown, together with materials occasioned by living organisms or their activities. We turn now to the third great division into which rocks may be separated and also consider matters relating to the use and understanding of rocks.

Metamorphic rocks are the substances which have been changed from their original form by such agencies as heat, pressure, torsion and chemical action. The original constituents may be crushed, melted, crystallised, re-crystallised, dissolved, re-cemented or otherwise affected. They may be changed into entirely new minerals, vastly different from the earlier varieties.

Metamorphism can occur in igneous, sedimentary or previously metamorphosed rocks. In the first group the resultant materials are usually somewhat banded in structure; in the second group the subsequent rocks are crystalline; in the final series the effects of extreme metamorphism cannot be readily described except perhaps to note that the results are usually unlike those of the two former instances.

Gneiss (pron. “niz”): Since granite is a common rock it is not unnatural to find that metamorphic granite is also a common substance, now termed gneiss—although, to confuse the amateur, sediments may also form gneisses.

These rocks are usually light in colour, with the distinctly banded condition mentioned above, which, in aquaria stocks, may be of such dimensions as to be unsightly. The bands are due to the fact that, in effect, the constituents have been re-aligned into crystalline grains of a mainly light and dark configuration. It is often difficult to distinguish between gneiss and schist.

Schist: Almost as common as gneiss and in some areas even more plentiful, schist exhibits minerals that have been re-grouped into flaky layers, the schistose texture of distinctive character. Possibly the most common member of the group is mica schist, so called owing to the high percentage of mica present. Feldspar is virtually absent. In mica schist the mineral has its plates arranged in parallel layers and naturally this form can be determined by the presence of flakes of mica, which have a silvery sheen. It will cleave fairly readily across the mica layer, the result being that the surface sparkles brilliantly. The colour depends upon the percentage of mica present and upon whether it is muscovite or biotite, being therefore light grey to almost black.

Other schists are also classified according to the nature of their contents, hence hornblende schist, chlorite schist, and so on. Hornblende schist, usually dark green to black, may be variously stained and may be somewhat lacking in the typical schistose structure, with the result that it often looks like a simple massive rock. It is a heavy material and strongly resists scratching by means of a knife. Chlorite schist, on the other hand, is so soft as to be scratched easily by this means.

Talc schist has a pearly lustre and a greasy feel and scratches easily with the finger nail.

Well-weathered micaschist or ‘massive’ hornblende schist, briskly scrubbed with a wire brush, have been used successfully in aquaria.
Rocks

Quartzite. Mechanical sandstones, under most processes of metamorphism, can produce a rock which although unaltered in composition nevertheless has had its state changed, for the constituents melt and are re-crystallised into a hard homogeneous rock, which, in the silica sandstone, is termed quartzite. The sandstone thus loses its typical texture and instead acquires a pseudo-granitic feldspar, which at the same time becomes very hard and compact. The colour of pure quartzite is white but impurities impart such tints as brown, grey, red, pink or even green. The hardness of this rock is such that it often results in castellations in highland landscapes while a quartzite capping on high mountains provides the underlying rock with considerable protection.

Slate. The schists metamorphose into a generally dense rock, which, unlike the original, is reluctant to split along the bedding planes but instead cleaves at a sharp angle to, or directly across, the true stratification—the typical and well-known slaty cleavage. In colour the slates vary considerably and can be grey or brown, black, red, green or yellow.

Marble. This is a limestone in which the calcite has been converted into a crystalline variety. The marbles are typically white in colour but the presence of impurities such as iron, chlorine and graphite (almost pure carbon) will show up in veining and graining. The general economic use for marbles is as a decorative stone but several simple limestones are also termed "marbles" owing to their very decorative nature and the fact that they will take a polish.

Marble, like other calcite materials, reacts to acid tests but will also break down more readily in such dilute acids as will hardly affect impure or more dense materials.

Serpentine. This results from certain rocks (i.e. magnesian limestones) being subjected to extreme or repeated metamorphic factors. It is mainly soft and often splinters readily, although some breaks may show an appearance very like that provided by water erosion. Flat surfaces often have a slippery texture. In colour the serpentine is of various shades of green but there are also red and yellow veins, motlings and masses and white veins are not unknown. A fibrous variety (chrysotile) is important economically and is better known as asbestos.

Perhaps the best-known deposit of "Serpentine marble" is that exposed at Linhead Head in Cornwall, where the manufacture of small ornaments and bowls is a thriving local industry, the rock is easily cut and polished by sandstone grinders.

Sources of Metamorphic Rocks

Mainly, but not entirely, schist: Northern Scotland (Sutherland: Serpentine) N. Central Scotland (Ayrshire: Serpentine) Anglesey Cornwall (i.e. Serpentine) Typical greenstone rocks: N.W. Scotland Anglesey Quartzites: Sutherland Ross and Cromarty Skye and Jura Argyll Anglesey (Holyhead)

Observations on Calcite

Calcitic rocks (limestones) have long been a matter of controversy among aquarists, but their determination can at least be settled easily—they can, virtually always, be specified by the application of weak acids such as vinegar or lemon and, by far the best and most certain, dilute hydrochloric acid. Any chemist will make up a small supply at a cost of a shilling or two and the acid should be carried in a well-protected dropper bottle, preferably of soft plastic to avoid possible breakage. If a drop or two of the acid is applied to the rock in question then the calcite will effervesce, giving off carbon dioxide.

The next point to consider is whether such a rock is likely to affect adversely any tank into which it is placed.

Schistoid rock (Wester Ross), slightly enlarged. After scrubbing with a wire brush some of the loose surface materials have been lost. There is a minor milky-quartz intrusion

Serpentine (Cornwall), three-quarters natural size. Mottled in light and dark green, the specimen's texture is such that it splinters readily. The serpentine lighthouse has been turned and polished
Horizontal strata (Devonshire) of alternating soft shaly clay and harder limestone layers. These cliffs at Lynmouth provide a classic example of horizontal strata.

Very slightly acid water, as in aquaria, will possibly take up about 600 p.p.m. of calcium carbonate in the course; it is this factor that results in the originisation of coves in limestone rocks. However, no reliable figures are available which might be applied to average use in aquaria and if one considers the amount of water replacement that may occur after siphoning off, the topping-up necessary owing to evaporation and so on, then it is clear that the conditions are so variable as to prevent the establishment of any real criterion. If a calcitic rock breaks down readily and rapidly then it will be dangerous in aquaria (a category into which chalk can be placed), but at the same time it must be stressed that the harder limestones do not act in this way and are perfectly suitable as decorative rocks; indeed they have been so used in aquaria for many years. This is simply because they do not cause trouble, are among the most commonly and abundantly available and their decorative nature is often outstanding. Westmorland, Devon Black, Cheddar Red, Manx—these are but a few of the trade names given to decorative limestones which frequently are found in use by aquarists. Serpentine is also used but, in view of the several variations in kind and texture, the writer is not inclined to recommend it for general use. Less interesting ornamentally are the hard calcitic limestones of South Wales, but they are perfectly safe in aquaria. These Carboniferous limestones are greyish but exhibit streaks and patterns due to the presence of fossil shells (mainly Brachiopoda) composed of a dense, whitish calcite. Note that the acid test can be applied to a number of rocks, visually sample sandstones, with positive results—the material being a sandy-limestone or a limy-sandstone, whichever one prefers! With some rocks having a texture that is sandy (and this includes some oolites) care must be taken when examining the result of an acid test because the texture may hide the effervescence. The writer examined a sandy limestone for very long periods without any noticeable effect, even though the structure was definitely soft.

Not that it should be thought that only calcitic material may cause trouble in aquaria, for there are numerous tonic elements. Since only chemical analysis will normally determine their presence or exact character we should return, once again, to the comment that soft rocks are dangerous.

If a piece of rock is placed in slightly acid water, or perhaps boiled in such a medium, with pH and hardness of the water tested before and afterwards, then the results may provide much useful information about the specimen’s value in a tank. A control test should be run as well, i.e., to undertake the same process in the same manner with the same container, with water from the same source but without any rock added, so that a basis can be obtained against which comparisons may be made. It might be found that even if the formentioned factors are unchanged nevertheless some aspect of the rock’s physical appearance can have altered and this would need to be regarded with considerable suspicion.

Locating Sources

For those wishing to collect their own decorative rocks a little study beforehand will be useful and for this one can refer to the geological maps ("Solid" edition) produced by H.M. Geological Survey, which are available for reference in some libraries and museums or can be purchased from the Survey museum in South Kensington, through Ordnance Survey agents or ordered from book-sellers. Probably the most suitable are the 25 mile to the inch (at 6s. each) or the 4 mile: 1 inch (at 9s. each). The legends therefore show the presence of such rocks suitable to aquarists as limestones, old red sandstone, Torridonian sandstones and conglomerates, millstone grit, basalt, slate, volcanic tuff etc. The "Drift" editions of these maps show the superficial coverings of the Earth.

From these same sources can be purchased Regional Handbooks, each of which covers a specific part of the country. These Handbooks (priced 6s. each) not only describe the rocks of the area but also offer other information relating to geological features and so on.

"Limestone", a map published by the Ordnance Survey, defines this group of rocks and quotes those which are being coloured according to the particular geological periods of the rocks concerned. As a general guide, it may be best to use rocks not younger than the Permian (i.e. Carboniferous, Devonian, Silurian, Ordovician). Note that geological tables, on this map and elsewhere, have the youngest periods at the top.

Those limestones which are used for road-stone, building stone and similar purposes might be preferred since this generally indicates one of the harder materials.

Collecting Specimens

Mine and quarry tips, road cuttings, exposed masses on the side of hills and mountains, scree slopes, the beds and banks of streams, the seashore—these may be considered the main sources of supply. Well-shaped rocks of suitable size are fairly rare in Nature, especially if the rock concerned is of homogeneous structure. Erosion of boulders by running water usually results in a rounded form, while rocks which will delight the eye of the aquarist will be found only in those places where the erosive power of water is applied to stationary bedrock or material which
is heterogeneous, such as conjoined strata of differing textures, as may be found in junction beds between series of rocks. By way of illustration, appropriate examples can be found in streams to the south of the Brecon Beacons in South Wales, where junctions occur between the Devonian sandstones and the Carboniferous groups.

The careful use of the hammer and chisel, file, grinders, and sand-paper can often produce the results that Nature fails to supply. Incidentally, the water-eroded or dissolved appearance of some limestones is often due to atmospheric weathering or to long resting in a phreatic zone (below the water table). See "pounding," below.

Choice of Specimens

It will be found to be a useful exercise to mark out on the ground a rough oblong approximating the size of the tank for which the rocks are destined, placing the pieces in position to obtain some guidance to what style, how many and how large the selected specimens should be. Many rocks can be broken to suitable size by means of hammer and chisel, geological hammer and so on, it being sometimes necessary to chip away a line of breakage beforehand. Before working on the selected fragments it would be wise to try out on another sample for this will provide a clue about how the rock may break and it will also show whether the material will "bruise" easily. It does bruise readily then it will be necessary to protect the specimen by wrapping it in rag or newspaper; this latter precaution can be of value during the journey home since subsequent bruising might spoil the rock before it actually reaches a tank.

As to whether sharp edges on rockwork are apt to damage fishes living in the tank, the writer's only comment on this is to ask whether the reader has, personally, ever had a fish damage itself by reason of this particular factor. In such cases perhaps it would be better to leave out sharp edges, removing them from the rock concerned by gently pounding with a hammer. It can be noted that some rocks can be given an eroded appearance by this "pounding" method, even if they will not permit of fashioning by any other method.

When striking rocks remember to provide some protection for the eyes, even if only to close the eyes at the moment of impact or to gauge distance while peering between outstretched fingers.

Attention should be paid to the manner in which a rock changes colour when under water, the effect usually being considerably darker than when it is dry. It would be a wearisome business, for instance, to carry rocks home from Scotland to the south of England only to find that the shades of colour virtually disappeared when the specimens were placed in a tank.

Gravel

Since the effect of running water is to remove gravel from the more massive rock from which it is derived (and the smaller the pieces of gravel the further will they be transported), it is not surprising that fragments derived from the same source as aquaria-site boulders may well have been carried several miles distant. It is often necessary to move some interval downstream when seeking gravel exactly like that of the source rock, but one may find such material beneath the surface of dry meanders and boxes.

At back eddies one may find ready-graded pebbles and the same may be found just on the down-stream side of large boulders at the sides of streams, having been deposited there during times of flood by water which lost its speed in swirling round the obstruction. In some cases the grading is remarkable in its perfection, but these spots are comparatively rare and depend upon a variety of conditions such as the kind of material involved, the situation of the larger boulders, general speed of the stream, quantity of water during flood and so on. If graded pebbles are found then separation by means of individual plastic bags, during transportation, will be an advantage.

Fossil Wood

I have often been asked where fossil wood can be obtained and the answer might well be "In the ground!". There are large quantities about, in various places, but this material
is really of more use and scientific value to palaeontologists than to any other group. Some sources of fossil wood are strictly protected by national or local organisations, but there are others where, if randomly and abundantly removed, the loss might well spoil the pleasure and interests of the site as far as fossil collecting is concerned. It is worth noting that in many cases fossil wood remains whole only while in its original situation, but if removed therefrom it disintegrates within a few weeks unless treated with special preservatives. These latter would not stand prolonged immersion in water, nor would the fishes benefit!

Layered Rockwork

Aquarists are often advised to place rocks exhibiting a layered structure in a horizontal position. Presumably this is an arbitrary ruling laid down by and for aquarists. While it is true that bedding is horizontal in some places, most sedimentary rocks have been moved out of their original position and are now tilted to a greater or lesser degree and may even be vertically upright. Indeed it would not be true to state that all sediments were originally deposited in a level position, for "swiss roll" and slump folding are commonly found as a result of deposition on a slope.

Many layered rocks are twisted and contorted into bizarre shapes similar to those resulting from volcanic or allied activity, while folds and tectonic can be considered the natural order of things. Subsequent erosion results in upfractured or tilted slabs. Aspects of perspective in a tank might be displayed better, or the attention drawn to some particular feature, if strata were laid other than horizontally.

It has been pointed out that the types of rock present in the crust of the earth are many and varied, and that in many cases the chemical analyses could determine whether or not a particular specimen had this, that, or the other constituent. However, perhaps the condensed notes provided in this series of articles may enable the aquarist to go some distance towards identifying his present rocks or those he might acquire in the future, especially if he goes to a site suggested by the maps mentioned in order to collect his own specimens. Remember, too, that a few minutes spent in the Geological museum in South Kensington or natural history museums elsewhere will help in problems of identification or sites. The contents of these museums are nearly always very willing to help the interested amateur.

It is not possible to list all the sources from which information may have been gained during the course of years of denotory study, collection, examination and discussion nor even to be aware of which person or work was the origin of which particular piece of information here presented. The bibliography lists but a few of these sources, while the writer gratefully acknowledges indebtedness to all, whether directly or indirectly involved.

The quoted sources from which rocks might be obtained have been derived mainly from personal notes, augmented by information culled from the Geological Survey and Museum; the staff of which organization have always proved very helpful in matters of identification and analysis.

Special mention should be made of the assistance provided by Mr. A. Crooke (New Cross Evening Institute) in the preparation of photographic prints from the writer's negatives.

Bibliography


Synodontis alberti

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or no overcrowding—is quite at home in a 24 in. by 12 in. by 12 in. community tank maintained at a temperature range of 72°F (22°C) to 76°F (24°C). There, apart from its decorative value, it will perform useful service as a scavenger. This brings us to the question of food, and food for S. alberti means anything from whole or chopped earthworms to algae and uncooked pondside pasta. In short, it is omnivorous in the widest sense of the word.

For the rest, given proper care and attention it is a long-lived fish that is more active at or after dusk than during the hours of daylight. Up to the present writing, it has not bred in captivity, and if the species carries any external sexual distinguishing features, aquarists do not know them.

"Can I have six cartons of your delicious dried Daphnia please!!"

THE AQUARIST
ABOUT THE POND THIS MONTH

To Feed or not to Feed?

by A. BOARDER

Whether to feed goldfish in the garden pond during the winter months is often a problem for pond-keepers. It is quite certain that goldfish can live through the winter without being given any artificial food. There is always something for them to eat in most ponds, although it is probably mostly vegetable matter. This, however, is quite good for them and so it is quite safe to leave the goldfish in a reasonably sized pond with no extra feeding at all. This does not mean that they will not eat if suitable food is offered. I have noticed that goldfish will eat broken worms even when there is ice on the pond. It has often been written in the past that no food whatever should be given to goldfish once the weather turns cold. Also where these fishes have not been fed they appear to have come to no harm.

Some pondkeepers have not fed their fishes at all for several years! I have known people who are surprised to be told that pond fishes should be fed at all, and who claim that their pond has been running successfully for years although they have never given any food to the goldfish at all during that time! One of the best ways of finding out how much vegetable matter can be eaten by goldfish is to keep some in a well-planted tank in the house where they can be watched. If no food is given it will be seen that after 2 days there are copious droppings coming from the fishes; it is the soft filamentous algae and slightly decaying vegetation which they have been eating.

Once the cold weather arrives the goldfish become very sluggish and remain low down in the pond. The whole metabolism of the fish slows down and in such a condition they require little if any food. These fish do not hibernate and will not eat when other garden fishes are active with quite small feeding, but their movements are slowed down considerably. It can be realised from this that the fish will not need the regular feeding which they may have had during the warmer months of the year. Most goldfish will feed at a good rate whilst the temperature of the water is about 65°F (19°C). They will also feed if the temperature is up to 70°F (21°C), as long as the water has a good oxygen content. Once the temperature of the water drops to below 50°F (10°C) then the appetite decreases accordingly.

This point about the oxygen content of the water is most important when considering whether to feed during the winter or not. If the water is at all foul then the fishes are not likely to want to eat and any food given will remain to foul the water more. A very good indication for the pondkeeper of when to feed is to take notice of the actions of the fishes before any food is offered. If they appear to be active then there is no harm done if a little food is given. This does not mean that as much should be put in the pond as would have been given during the warmer months of the year. Always give a very small piece of broken worm first, then if this is taken some more can be given. It is a great mistake to give a lot of food at a time during the winter.

I find that garden worms are the safest and best foods for the goldfish during the colder months of the year. It may be thought that these cannot be procured during the winter but the good pondkeeper will collect some worms before the frosts set in. They can be kept for a long time as long as certain precautions are taken. There are three important points to watch when attempting to keep garden worms. They must be damp, cold and dark. A large galvanized can will make a good receptacle. Do not put any earth in the can. Worms kept in earth soon die and decompose. A good depth of decaying leaves is the best medium and these should be just damp, not sodden with water. The can must be kept in a cool position and, of course, be covered to exclude the light. One of the main causes for the death of worms in tins during the summer is that they become too warm. This is not likely to happen during the winter, but a very cold place is always the best.

If you do offer small pieces of worms in the winter, watch to make sure that the fishes are eating, and always give the food in the same place. The fishes will soon learn to come to that place when hungry and any food scattered can be seen readily. I do not advise that any other food should be given. If the pondkeeper is fortunate enough to have a good supply of white worms, they can be given, but if the fishes are of a good size it will take many white worms to make a good meal. Even a 3 inch goldfish can take about 50 white worms in its mouth at one go, if these are in a ball. I am sure that it is not worth the risk to feed with any dried foods once the temperature of the water falls below 45°F (7°C), as any food not eaten can soon upset the balance of the water.

The advice given for goldfish will also be applicable for hi-go and other types of carp, but if there are other freshwater fishes in the pond their wants may be different from that of the goldfish. If tench, either grass or golden, are in the pond it may not be necessary to feed them from the end of November to the end of February. They are a very sluggish fish during the winter and need little food. They could, of course, find something to eat if they required it either in the form of water snails or other live foods which may be present in the pond. As well as live foods they can also eat plenty of vegetation. Such fishes as roach eat very well during very cold weather but it is not likely to find any of these in the ordinary garden pond. They would soon clear out all the goldfish and smaller fishes.

Some pondkeepers have a few perch in a separate pond and very handsome they are, too. These will have to be fed for most of the year. They are very fond of garden worms and also small fishes. It may be possible to catch some sticklebacks for them. It may be thought that the spines of the sticklebacks would prevent the perch from eating them, but this is not so. I have found many of these little fishes in the stomach of a perch I had caught, also having used them as live bait.

Other coldwater fishes such as rudd and dace will also eat a little during the winter but always make sure that the fishes are active and take food readily before giving much at one time. You can be sure of this: none of the usual pond fishes as kept in garden ponds will come to any harm.
TRANSPORTATION of tropical fishes is always a problem. The mortality risk incurred even in warm weather is considerable, but when it is cold, and a large number of fish have to be conveyed a lengthy distance, extreme care must be taken. One method which I have found to be successful relies for its heat on a hot-water bottle! I found that by placing the bottle on the bottom of a cardboard box, inserting an insulating layer of crumpled newspaper, and then introducing a similarly insulated goldfish globe, or large jam-jar, a register temperature could be maintained for several hours. Since the heat arises from the base, circulation was established ensuring all the water was of the same temperature. Regulation against over-heating was supplied by a covering-cloth, placed over the whole set-up, which could be removed if the thermometer reading registered too high. This system has the added advantage of reducing the temperature adjustment time, necessary before allowing specimens into the home aquarium, and is ideal for transporting fishes by rail or car on a cold autumn or winter day.

One hates to think about it but the cold weather will be with us again before long—and there are some simple precautions that can be taken to protect specimens against increased hazard. Partial lagging of the tank by day and total lagging by night is a simple procedure which both reduces electricity costs and protects the fishes. It may most easily be accomplished by the use of cushions—or more conveniently by the under-feathering used for carpets. If the latter is applied with care no aesthetic effect need be lost; all but the front panel are covered during the day, and in the evening the final piece is put in place—lagging is particularly important in areas prone to electricity cuts.

While on the subject of winter preparations an oil-lamp, or if gas-pipes are available, a gas-fuel aquarium heater, are useful investments as stand-bys against power-failures; also the spare immersion heater for your tank. One aquarist I know once spent half the night sitting by his tank trying to keep a single aquarium at a constant heat with the electric fire—how much trouble he could have saved himself by a little forethought and a minor outlay!

Fishmongers are often a mine of information about the products they sell, full of fish-fables and stories. My local fishmonger told me an interesting legend about the hindloch. Two black marks on either side of the head, are said to be the finger prints of Christ, permanently visible in this species from an occasion when Christ is supposed to have handled it. I have seen many so-called traces of Christ, and heard of many more, but never before realised one was visible on one of the fishes we most commonly eat.

Near the popular tourist resot of Lugano in southern Switzerland lies the little village of Melide, locally famous for its splendid "Swiss Miniature", a magnificent collection of models of various Swiss buildings and beauty spots. Situated beneath an artificial mountain is a most attractive aquarium, well worth a visit for its own sake. Delightfully displayed in a number of bright and well-planted tanks are a wide selection of tropical fishes, and a few amphibians, individual specimens among which appear to be of a very high standard. It is always a pleasure to come across a well-kept aquarium in an unexpected place. I have seen some have been installed in certain subways—in my opinion a highly commendable move!

At the time of writing reports are still coming in concerning the threat to the English salmon industry arising from the netting of fishes in migration off the coast of Greenland. Experts rightly perceive the possible dangers resulting from these mass catches, which are a very different matter from the highly regulated capture of fishes as they swim up and down the rivers to and from spawning. It should also be remembered that what is at stake is not merely the sporting pleasures of a minority—but a very important national freshwater fishing industry.

The salmon is not the only fish to migrate up our rivers, and from Christchurch in Hampshire I hear that a splendid shad harvest has been obtained this year to supply the market at Billingsgate.

Rocks for the aquarium are always a problem. Marbles, quartz and similar calcium carbonate rocks (along, incidentally, with sea-shells) are highly unsuitable because of the adverse hardening effect they have on the water. Granites, however, seem to be ideal. Many pleasant shades ranging from delicate whites and pinks to dark blacks can easily be found (especially round the lochs of Scotland), making it a highly attractive stone from a decorative point of view. Coal, too, may be used to contrast with white or pale coloured fishes, and is said to possess certain algae-destroying but otherwise harmless elements. Of course, the safest decorations of all are the commercially sold glass "rocks", which have no appreciable effect on the water at all.

When visiting a bazar in Turkey I saw water leeches for sale in milk-bottles. They were definitely not the medicinal species and for a long time I have been perplexed about the use to which they could possibly be put. Have readers any ideas on this point?

To Feed or not to Feed?

continued from the preceding page

If they are given no artificial foods during the colder months of the year. Naturally, the size of the pond, and the number of fishes in it, will influence the amount given. If a pond is well planted there is less necessity for extra feeding. Amongst most water plants there are likely to be found many waterlice (Anatolus) and freshwater shrimps (Gammarus). In addition there may be larvae of various insects. Many water plants are of clean water and although during severe weather they are not likely to be on the move above ground, it only wants a short mild spell to bring them up to the surface and to move around during the night.

The pondkeeper must therefore use his discretion about whether to and when to feed the fishes in the pond. Take note of the condition of the water and the activity of the fishes and if any food is given see that it is not dried food and give only a little at a time.
British Aquarists’ Festival 1965

Large crowds attend the fifteenth B.A.F. at Manchester

Another very successful British Aquarists’ Festival took place at Belle Vue, Manchester on 27th and 28th November. Although the weather was very cold and wireless and newspaper reports were unfavourable a vast number of people turned up to enjoy the very fine exhibition. The Saturday brought many visitors, but on Sunday the hall was quite filled for most of the time. This was in spite of the fact that the area used was bigger than ever, being about 130 yards long and 30 yards wide. Many very attractive stands had been erected by the numerous societies competing. A novel stand was in the form of bar, complete with pumps and bottles etc. Another represented the Blackpool pier and even had a full-sized model mermaid, entangled in fishing nets. One stand took the form of a ship, another that of a row of petrol pumps and others also showed much imagination.

This type of show is so very attractive to visitors who may not be actual aquarists. But the true aquarists could find plenty of splendid specimens to interest them. Some of the tropical fishes exhibited were really impressive, many being of a large size that drew admiring comments from visitors from the south. The coldwater fishes were rather disappointing, as the fancy goldfish were lacking in numbers and in most cases in quality. Where have all the good fancy goldfish gone? The dealers’ stands were

December, 1965
OUR EXPERTS’ ANSWERS TO TROPICAL AQUARIUM QUERIES

I have had my aquarium set up for about 3 months, but I just cannot get my plants to flourish... I have been told that if I scatter water around the plants the plants will grow. Is this true?

It is not true, except perhaps when carried out by someone who knows just how much, and what sort of water to use. It is best to introduce a tank of water without causing trouble. It is safer for the beginner to use washed sand alone.

In time, the various trace elements necessary for plants to flourish are dissolved out of the fishes’ excreta. For even in a very well cared for aquarium a lot of powder-fine sediment settles down into the compost and helps to maintain the plants. However, there is a way of ensuring better root growth than that obtained in washed sand alone, and that is by spreading a quarter-inch thick layer of well-soaked, granulated peat or crumbled baled peat over the bottom. Cover this with at least 2 in. of sand. Peat will not ferment or give rise to smelly, milky-looking water. But please note that whatever planting medium is used, plants will not grow properly unless they receive the proper quality and quantity of light.

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

The muddy shallows of a brook running through a field are red-stained with Tubifex... Yes when I attempted to obtain some blue-stained Tubifex the dealer offered me something like magic. How does one get about collecting this live food?

What you need is a scoop-shaped shovel fixed to a long handle. Plunge the shovel into the Tubifex-inhabited mud...
Lift it quickly, and turn the mud out on to a piece of fine wire gauge or fine nylon net just dipping into a bucket of water. The worms will wriggle out of the mud and collect in a ball on the bottom of the bucket. Every now and then, set the water out and remove the worms to another container. Whatever you do remember to stir the worms around in clean water—several changes of water—before feeding them to your fish.

What easily obtainable and peaceful tropicals could I keep in a brackish water aquarium already stocked with Malayese angelfish and scots? Provided that you make the change from fresh to salted water gradually, the water, foods, and food stages, grapes and melons should settle down very well in a brackish water tank.

Please tell me a quick and painless method of killing an old and very sickly fish. Display the fish with as much force as you can muster against a brick wall or on to a stone path. Death will be instantaneous.

The water in my terrapin tank quickly becomes green with free-swimming algae. I have been wondering whether I could use this green water to feed the fry. Your comments on this would be appreciated.

In my experience, green water dipped out of a properly cared-for terrapin tank is perfectly safe to feed to tiny fry. We would also like to add that a terrapin tank provides ideal conditions for breeding Daphnia. In fact, enough "dun" can be removed from a reasonably sized terrapin tank twice or thrice a week to help out the initial live food requirements of a few score of young fry.

Please give me some information on the fish called the salmon discus.

The term 'salmon discus' is applied to all species of the genus Pseudotropheus, which is widely distributed throughout tropical South America. Salmon discus are lively, peaceful, and quite comfortable at a temperature range of 72°F (22°C) to 80°F (27°C). They will feed on anything alive or dead. But they have one failing: they have a marked tendency to being disturbed, and any sudden shock will sometimes result in their sinking to the bottom and remaining there on one side. A severe shock can sometimes result in death. It follows therefore that salmon discus do not take kindly to netting, or frequent changes of their surroundings.

Would it be safe to use a perforated zinc screw to divide a large tank into two compartments: one for invertebrate fishes, the other for aggressive cichlids?

It would be asking for trouble to introduce a perforated zinc screw, painted or otherwise, into your tank. Zinc is highly toxic. Your best plan would be to divide the tank into two by the addition of a glass panel, cut to fit fairly closely at the sides, and held in place by rubber or wood wedges. To protect the snouts of the fishes from possible injury, it would be a wise precaution to blunt the razor-like edges of the glass with a few rubs of a carbondum stone.

I have a deep tank which I keep only half-filled with water. It is my intention to build up a sort of rocky crevice along the back above the water line and furnish it with attractively marked and interestingly shaped foliage plants set in peaty pockets. What plants do you suggest? The tank receives adequate growing light.

You can hardly do better than choose from the following: Anubias barteri, Echinodorus bleherii, False-diffuse, and Ludwigia palustris. The rampant Helocharis salina—the type or the gold or silver varieties—is useful for draping habitually moist rockwork with a mantle of minute leaves.

December, 1965

I would like to keep a piranha. Can these fish be bred in aquaria?

Remember that the small specimens offered by dealers can grow to 9 inches in length. Since it is at something about this size that they will breed, you must be prepared to devote large aquaria (36 in. or more) to them. Breeding would be well worth attempting for there is a good chance of success and there is much yet to be observed about the development of this fish.

Apart from fairly frequent touching up with a quick-drying cement paste, is there any way I can prevent net forming and flashing off the top edge bars of my aquarium?

Yes, you can obtain "U"-shaped plastic strip from any well-stocked dealer's shop, which can be pushed over the edges of the angle bars. As a rule, this protection will stop much, if any, rust forming for a very long time.

Can you tell me how to keep the temperature of my 24 in. by 12 in. by 12 in. aquarium from rising after the light is switched on at night? I am afraid that the difference in temperature that occurs between the upper and lower levels of the water will prove harmful to the fish.

Do not worry about this. In nature sunlight has the same effect. Some fishes enjoy basking in the extra heat that sun or electric illumination will give. It is a sudden all-over change in the temperature, or a rapid drop from the normal temperature to below 65°F (18°C) that must be guarded against.

Following the instructions outlined in a tropical fish book, I dissolved a few crystals of potassium permanganate in a cup of water and emptied this into my aquaritum to try and rid it of free-swimming algae. Within an hour or two all the fish were peeping at the surface and I had my work cut out for the next hour or so draining the water off and replacing it with fresh. What was the cause of this?

The solution you emptied into your aquarium killed off the microscopic plants so rapidly that they completely upset the balance of the water. If you ever use potassium permanganate again, take care that you do not introduce too much of it into the aquarium at a time, particularly so if the water is very green and there is much sediment on the bottom.
For a while the fish grew rapidly; but now they make no progress at all. Do you think dried food with occasional feedings of Tubifex is sufficiently body-building?

To grow any of the larger cichlids to a large size they must be given plenty of meaty food such as chopped or tiny earthworms, once or twice a week. Also, washed liver. But food alone will not produce large angelfish. What this fish needs is plenty of swimming space in clear, well-aerated water. If you remove two of the fish from the tank the other four will fizzle ahead.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER.

I intend to make a small cement fish pond in the garden and would like some information on procedures. The pond is in a position away from trees or shrubs. If on a high part of the garden it will be easier to empty it necessary and will not get drainage from the garden into it. Consolidate the base before concrete and insert many bricks, stones of a firm foundation. Mix a mixture of two parts of aggregate, three parts of sharp sand to one part of cement. Tamper the concrete so that the finer材料 is brought to the top, as this obviates the use of a separate coating with a finer mixture. If the pond is made sloping sides the use of shatterers will be obviated. The cement needs to be 2 inches thick for a small pond and 3 inches for a large one.

I have made a pond 10 ft. by 3 ft. 8 in. and 1 ft. deep. How many comets and teich should be introduced? Your pool is very shallow and may freeze up badly in severely cold weather. A dozen fish of 3 inches in length will be enough, as you must allow for growth. A friend of mine has recently lost a shubunkin and two green teich in his fibreglass pool. They seem to have fungus on them. What is the reason for this? The water in the pool must have been foul for the truck to die. That is, of course, assuming they were in a healthy condition when they were obtained. Testen can live in water which would be toxic for goldfish and are usually very hardy. The water and its source should be checked to try to find the fault. Did it come through copper pipes? I was recently called to a small garden pool where the goldfish died within about 2 days after they had been introduced. I instantly spotted the trouble; a copper pipe fed almost continuous water to the pool and the house supply from which it came was also all copper. I advised a complete change of water to a pure source and there has been no trouble since. The water could also have been polluted by overfeeding; many new pondkeepers just cannot refrain from feeding their fishes every time they see a fish at the surface. The resultant decaying of the uneaten feed could soon cause trouble.

I am greatly disappointed at the state of my pond. It is very thin and so the fishes move like they stir up a lot of sediment which makes it almost impossible to see them. What can I do to remedy this?

The easiest way is to introduce plenty of underwater oxygenating plants. These will soon become established in the middle, use up much of it and prevent the rest from coming up from the bottom.

My coldwater tank is not functioning well. I put some builder's sand into it and planted some water crowfoot plant in it. The water is now a greyish colour and the sand has gone black. Why is this?

The sand may not have been to the liking of the plants; crowfoot is not easy to get growing quickly when it is introduced from a natural pond or river. The black sand indicates that there is something decaying there, and it could be the dead water plants or uneaten food. Before any fishes are put into a tank it is better to see that there is a healthy growth of water plants there first. The greyish water is probably full of Infusoria which are thriving in the polluted water. Change everything and make a new start.

I am making a garden pond and would like to try some other coldwater fishes apart from goldfish. I once saw some fish which I was told were 'blue carp', but I cannot find anything about them. Can you help?

I know of no species of carp known as 'blue', but I suspect that the fishes referred to were live-gold. They grow very large and are often used in large ponds. The shubunkin is sometimes coloured blue, but would not be known as a blue carp.

Can you tell me what the weed is which grows like fine green cotton all over my plants and how to get rid of it?

The weed is blanket weed, a form of thread alga. This thrives in warm weather and is a deficiency of the amount of water plants, especially the underwater oxygenating ones. Once these grow stronger they can choke out much of the weed.

I am interested in planting forms at the pondside and would like to know when is the right time to do this?

Ferns are usually planted just as the fronds start to unfurl, in the early spring. If you could obtain any in pots it would be possible to plant them at any time as long as they were well watered before and after planting. It would be taking a chance to try to move large established plants at any time except the spring.

Three years ago I made a concrete pond and I recently decided to increase the depth by adding about 4 inches all round. Since I have done this the water leaks away, presumably at the joint of the new concrete to the old. What can I do to make it waterproof?

It is always difficult to get fresh cement to join up, or weld, to old. The best thing you can do is to scrape all round the joint with a broken file or similar instrument. Make a slight groove all round the pond with no break in the run. If you lower the water level of the pond a few inches you will be able to work without actually empyting the pond. Try to catch the old scrapings as you work to prevent too much falling into the water. Now get some fine, sharp sand and mix one part to one part of Prompt cement. Push the new mixture well into the crack, working continuously all round the pond as quickly as possible without a stop. This cement sets very quickly, so wet only a little at a time. It can set in about half an hour. After a couple of hours you can put a sponge or piece of cloth on it, so the free lime is removed. It will then be possible to refill the pond and all should be well.

THE AQUARIST
Around the Aquariums

by MIKE SHEEDY

The Aquarium at the Bristol Zoological Gardens has proved a great success with the many thousands of visitors who visit there. Many alterations have been made from time to time and it is now a very fine attraction with a vast array of exhibits.

The tanks in the Aquarium are arranged so that visitors may look over and see the fish and other creatures as they are displayed from the underwater viewing windows. Visitors can see them at their own level, and small tanks containing tropical fish are artificially lit and heated. The other tanks have daylight illumination.

Some seawater fish are found on the eastern coast of this country can be seen in the first large tank, including the plaice whose colour can be changed to match the background.

In freshwater tanks various lake and river fishes can be seen. Various members of the carp family and several goldfish are also exhibited from the muddy rivers of South America (see Around the Aquariums, August issue of The Aquarist). They swim by small undulations of the long fin on the underside of the tail. The main bulk of the tail is developed into the electric organs which are modified in these fish to produce a shock of several hundred volts.

I had a visit from a reader recently who had just returned from a holiday in Devon. He had paid a visit to the Paignton Zoo and spoke very well of what they had to offer. He told me he enjoys reading my notes and was looking forward to paying a visit to see the Bell Vue Aquarium, which I recently reviewed in The Aquarist.

Readers are always welcome to call and see me.

The Wellington, New Zealand branch of the S.P.C.A. is progressing against keeping dolphins in captivity. Recently a petition was tabled in Parliament. The petition was signed by 1900 people, and the dolphins would be returned to the sea. The dolphins were being kept in various parts of the country. The mammals were highly sensitive to captivity. They were considered the nearest in intelligence to human beings of any wild creature and were held in respect by the early Greeks and Romans. A petition was sent to the Wellington branch of the National Zoological Society to request that the dolphins be returned to the sea. The dolphins would be returned to the sea at Napier, New Zealand. The petition was signed by 1900 people, and the dolphins would be returned to the sea. The dolphins were being kept in various parts of the country. The mammals were highly sensitive to captivity. They were considered the nearest in intelligence to human beings of any wild creature and were held in respect by the early Greeks and Romans. Three of the dolphins in the Napier pool had died, leaving only two of the original five.

Another petition will soon be ready with Miami as the place to use trained dolphins in action. At the moment the dolphins in Napier's Marine Parade pool are learning the first of the repertoire of tricks planned for them and...
Why Breed Fishes?

Mr. A. Burch, in his article "A Criticism of Fish Breeding" (The Aquarist, September), begins: "The successful breeding of fish is often thought to be the ultimate goal of every aquarist". It would be more correct to say that, with few exceptions, this is the ultimate goal of every aquarist. There are many reasons which justify such a statement, and I have bred both coldwater and tropical fishes for each of the following reasons at various times.

Curiosity prompted my first attempt. This, I admit, is the least valid reason, and my curiosity was soon satisfied.

It is possible, despite what the experts tell us, to make a profit out of fish breeding. I suspect them of spreading the idea that it is a "ruin's game" merely to deter prospective amateur breeders who would cut a tiny slice out of their market. Earning a living at it is strictly for the full-time breeder with well-equipped premises. On a small scale, it is possible to retain one's initial outlay on equipment and pay the electricity bill. This is profit.

Most beginners would welcome the opportunity to stock a community tank for the price of one pair of fish. This is possible, requiring only patience, membership of a local club, and cooperation. Just publicise your tank full of home-bred "wraps" and have you community.

It is just as interesting to stock a tank from the original pair, not as a community, but as a shoal. I disagree with the critic's observation that individual fish become submerged in a shoal. They establish themselves. Many types, notably the smaller carasses, are not meant to be individual fish anyway, and are seen at their best only when in shoals.

Breeding fish has an educational value, in homes as well as schools. Any aquarist's child has an early grounding in the facts of life, and this is never derived from watching the community tank!

I accepted that all fishes look their best when ready for breeding. If you feed and condition your fishes to keep them at the peak of perfection (as you should do), then why not, logically, breed them?

As shown, the most coveted awards are those for the breeders' classes. This is natural, since it is so much more of an achievement to show six well grown, perfectly matched fish that one has bred, than to buy a good fish, keep it for a month or two to comply with the regulations, and carry home the trophies.

This same sense of achievement is, without doubt, the main reason why we amateurs do breed fish, whether they are shown or not. Admiration of one's community tank by friends and neighbours is rewarding to one's ego, and watching the tank itself is very satisfying; but most aquarists soon feel the need to do something more objective.

This applies to all hobbies. The man who clicks his shutter, drops the film at the chemists on his way to work, and claims photography as his hobby, is either misguided or boasting!

The big disadvantage, claims the writer, is the difficulty in disposing of surplus fish. I have sold fish, though I will admit I must have been fortunate to find dealers who would accept an amateur's diseased stock! I have killed fish—only the offspring of parents which I could not prevent breeding—and though I would rather dispose of them in some other way, I did not find the emotional conflict too disturbing. I have also exchanged fish.

On many occasions I have given fish away. This is by far the easiest way, and the gratitude earned is as satisfying a reward as the income derived from selling fish. (I must add that I consider the donation of a dozen unwanted guppies to the local hospital's tank a deplorable trick.)

On reading your article again, Mr. Burch, I find myself beginning to suspect your motives in writing it: are you a professional?

R. S. Holmes,
Limassol, Cyprus.

More British Accessories Wanted

I am comparatively new to tropical fish-keeping, but I and fellow aquarists whom I know are sadly disillusioned about the hobby in this country. Why is it that in America and on the continent more accessories are available than here? Almost everything we sell for the aquarium is foreign.

Although I have only been fish-keeping 8 months I have over 200 fish and 14 aquaria, and have just built myself a fish house; so you see I am enthusiastic.

I have travelled all over the country to obtain fish, and I can honestly say that with exceptions the dealers were to say the least very disappointing. Why don't these professional aquarists stock cichlids, and other unusual types of fishes? I saw only guppies, platys, angelfish, mollies, and tiger barbs.

A. Chapman,
Crews, Cheshire.
Aquarium Decoration

WILL often hear about various methods of arranging rocks and plants to make the home aquarium more pleasing to the eye, but I wonder how many readers have thought about the attraction on the outside of the tank. The method I refer to is to fix a piece of card to the outside of the frame of the aquarium with its inner edge cut to a wavy shape representing the mouth of a cave.

The card can be covered, as I have done, with ‘brick’ paper—obtainable from most hobby shops, or painted to represent rocks. This seems to give the tank more depth, and definitely more attraction. The same method can also be applied to each end glass. The idea behind fixing the card first is to cut out the light that would otherwise shine through the paper and thus spoil the required effect.

A. MARSHALL,
Gorleston-on-Sea, Norfolk.

More Scope at Shows

Many readers of your publication have expressed their disappointment and regret, in past issues, that rarely, if ever, are classes for coldwater and/or tropical marine fishes included in societies’ show schedules. In an effort to find a solution to this problem, my Society, at its last Committee meeting, unanimously agreed on a proposal to provide such classes at its Fourth Annual Open Show, to be held in September, 1966.

This decision is typical of the policy of the Society, in their recognition that the minority, as well as the majority of aquarists, must be catered for. Our Society, regarded for all as the most go-ahead club in the Principality, have taken the lead in this matter. Will any other Society follow suit?

M. J. PARREY,
Show Secretary,
Newport Aquarists Society.

British Killifish Association

I AM writing on behalf of the British Killifish Association, to let you know that we have had a big response to the announcement made in The Aquarist. I mentioned we could bank on a hundred members. We have passed this mark quite easily, and we have also members from overseas countries, Denmark, Spain, South Africa and India. All have proved most helpful to us.

We have also imported species that are quite new, e.g. Poecilia zonata, Astyanax fasciatus and Astyanax fasciatus maculatus; we hope to have a new Notobranchius species in the spring.

These species are being bred by our News Species Propagating Committee, consisting of twelve experienced breeders of goldfish, and these will then be made available to members.

Show slides are being made (with tape recordings) showing different species, their habits, breeding procedure etc. These will be available to members and societies in the future. In all we look like having a very successful Association.

PAUL STOKES,
Chairman,
British Killifish Association.

Swimming Speeds

That the swimming speeds of fish given in Mr. Fry’s article (The Aquarist, August) struck Mr. R. McN. Alexander as improbably high is easy to understand, but more than a quarter of a century ago Frank Lane recorded in Chambers Journal (November, 1938) that tuna are capable of accomplishing the journey from the coastal waters around Provence or Liguria to Sicily and Tunisia in a day or two. This, assuming that Mr. Lane’s assertion is correct, is fast going. But then, the rapidity with which certain marine species can move, even when hooked to the end of a line, is a favourite subject of discussion among those interested in game fishing. Quoting from an article published in The Countryman of Spring, 1943, A. G. Magri McMahon, in his highly informative Fishlore (Penguin Books, 1946), gives the speed of tuna as 44 m.p.h.; the blue shark 26.5 m.p.h.; pike 20.5 m.p.h.; trout 23.25 m.p.h., with the salmon a little faster; and roach and perch about half that speed. These and similar figures have been quoted in various angling magazines published over the last 20 years. As the late J. R. Norman, in his monumental History of Fishes, pointed out (if my memory serves me right), little research has been done in this interesting subject, and the speed of fish is still largely speculative.

JACK HEMI,
Leicester.

For the Record

THE specimen of Elosia donia shown laid out in the photograph has a continuous main stem length from root point to growing point of 11 feet 6 inches. It has two side growths totalling 5 feet 2 inches in length. All this grew from a short cutting planted in a 24 in. by 12 in. by 15 in. aquarium kept at 75°F (24°C) and left undisturbed for about 4 months this summer. The growth formed a winding mass in the tank just below the water surface. (In the picture the dark rectangle is a strip of wood 12 inches long.)

December, 1965


The AQUARIUM Crossword

Compiled by L. Bradley

CLUES ACROSS

8. One-celled animal (6)
9. I, with water and iron mixed, for fish (6)
10. Impeccable song by a great desert bird (7)
11. Painted tortoise shell (5, 6)
12. For food in a sea fish, make it at the saucepan (6)
13. Small mammal (6)
14. South American beaver (6)
15. Measure of resistance (5)
16. Japanese monetary unit (5)
17. Small portion of date (5)
18. Pieces of cutaneous, myriapods and insects divided into articulate segments (9)
19. Sound like a clack, this fabric! (5)
20. Does it make one see one white elephant? (4, 5)
21. Genus of pond mussels (8)
22. Sea hawk (8)

CLUES DOWN

1. Sulpateur (6)
2. Occurring every fourth day (7)
3. Resuscitate. Wash out by a bath? (7)
4. Names the current price (5)
5. Having pH greater than 7.0 (6)
6. Man-made river (5)
7. Suitable description of the dwarf guppy (5)
8. Appearance on the spindle-disc culture (9)
9. A, B, C (5)
10. Like father, like son (8)
11. Vehicle that is backed up by a reversing mechanism (8)
12. The one o'clock (7)
13. Floating (9)
14. Set of men (3)
15. Roast dinner (5)

Solution on page 109
Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 15th of the month preceding the month of publication.

THE PORTSMOUTH A.S. held a Table Show in the New Year. The judge was Mr. J. C. Roberts and the results were as follows: Chairman, Mr. D. B. A. Murray; Secretary, Mr. M. D. B. A. Murray; Treasurer, Mr. J. C. Roberts; Committee, Mr. M. D. B. A. Murray and Mr. J. C. Roberts. The Chairman's trophy was won by Mr. J. C. Roberts. The Secretary's trophy was won by Mr. M. D. B. A. Murray. The Treasurer's trophy was won by Mr. J. C. Roberts. The Committee's trophy was won by Mr. M. D. B. A. Murray.

The points shield was won by Mr. P. C. Herrington with 24 points and the runner-up was Mr. S. M. Jones with 12 points. Any Aquarium wishing to become a member, please contact the Secretary, Mr. A. L. Smith, 31, Hidden Road, Barry, 53.

IN OCTOBER, the Manchester Section of THE FANCY GUPPY ASSOCIATION held their Annual Autumn Open Show. The show was very successful and the entries were from all over the country. The judges were Mr. J. L. Smith and Mr. J. L. Smith. The winners were as follows: Best Male, Mr. J. L. Smith; Best Female, Mr. J. L. Smith; Best Breeder, Mr. J. L. Smith; Best Variety, Mr. J. L. Smith; Best Popularity, Mr. J. L. Smith; Best Presentation, Mr. J. L. Smith; Best Overall, Mr. J. L. Smith.

AT THE BATH A.S. meeting, there was a horticultural display of cacti and succulents, which was judged by members of the Penwith A.S. and the results were as follows: Chairman, Mr. J. L. Smith; Secretary, Mr. J. L. Smith; Treasurer, Mr. J. L. Smith; Committee, Mr. J. L. Smith and Mr. J. L. Smith. The winners were as follows: Best Cacti, Mr. J. L. Smith; Best Succulents, Mr. J. L. Smith; Best Overall, Mr. J. L. Smith; Best Presentation, Mr. J. L. Smith; Best Variety, Mr. J. L. Smith; Best Popularity, Mr. J. L. Smith; Best Overall, Mr. J. L. Smith.

THE FOURTH of the Six Club Trophy was held and the competitions were won by the following clubs: North West London A.S., Cambridge A.S., Hull A.S., and London A.S. The judges were Mr. J. L. Smith and Mr. J. L. Smith. The winners were as follows: Best Male, North West London A.S.; Best Female, Cambridge A.S.; Best Breeder, Hull A.S.; Best Variety, London A.S.; Best Overall, North West London A.S.; Best Presentation, Cambridge A.S.; Best Popularity, Hull A.S.; Best Overall, London A.S.

AT THE ANNUAL GENERAL MEETING OF THE WATERFORD A.S., the following officers were elected: President: Mr. J. L. Smith; Vice-President: Mr. J. L. Smith; Secretary: Mr. J. L. Smith; Treasurer: Mr. J. L. Smith; Committee: Mr. J. L. Smith. The meeting was well attended and the report of the society for the year was read. The report showed a healthy increase in membership and the society has made good progress in the past year. The new officers were elected and the meeting concluded with a vote of thanks to the outgoing officers.

AT THE ANNUAL GENERAL MEETING OF THE ABERDEEN AND DISTRICT A.S., the following were elected: President: Mr. J. L. Smith; Vice-President: Mr. J. L. Smith; Secretary: Mr. J. L. Smith; Treasurer: Mr. J. L. Smith; Committee: Mr. J. L. Smith. The meeting was well attended and the report of the society for the year was read. The report showed a healthy increase in membership and the society has made good progress in the past year. The new officers were elected and the meeting concluded with a vote of thanks to the outgoing officers.
ON Sunday 31st October, a meeting of the South London Section of the F.G.A. was held at the Lady George House, Hawthorne Road, Rotherhithe, London, S.E.16. Due to membership increasing at such a fast rate, the new meeting place was accepted by the members as the regular meeting place, as is alleged numbers over room and greater comfort. Even though it was raining, a record 45 members and guests were present, with attendance for the Table Show all of this was hailed by Mr. G. Goodall, chairman. After a general discussion took place, this included arrangements rather than unnumbered items. After light refreshments were had, the show was officially opened with a demonstration. Results of the Table Show:—Table T.1, Mr. A. Park (72 points); 2, B. Baker (68 points); Perfect Pairs, 1, B. George (66 points); 2, A. Goodall (66 points); 3, S. Carr (56 points); Special Points, 1, Mr. J. Durran (115 points); 2, Mr. B. Baker (101 points); 3, B. George (77 points); Judges: 1, Mr. W. R. Benfield; 2, Mr. J. Durran; 3, B. Baker.

THURSDAY: The Table Show of the Coventry and District A.S. was held at the Park Hotel, Park Street, Warrington, Cheshire. This show was attended by Mr. E. R. Nicholls, who conducted a very interesting and informative talk on "Fishing Methods." This talk was well received and was followed by a discussion on the various methods used by different societies throughout the country. The show was judged by Mr. J. Durran and Mr. W. R. Benfield.

THURSDAY: The Match Show of the South London and District A.S. was held at the Lady George House, Hawthorne Road, Rotherhithe, London, S.E.16. The show was attended by Mr. E. R. Nicholls, who conducted a very interesting and informative talk on "Fishing Methods." This talk was well received and was followed by a discussion on the various methods used by different societies throughout the country. The show was judged by Mr. J. Durran and Mr. W. R. Benfield.

RECENTLY: The Haddon & District A.S. were visited by the A.S. of the New Forest. The visit was well received and was followed by a discussion on the various methods used by different societies throughout the country. The show was judged by Mr. J. Durran and Mr. W. R. Benfield.

TWO MEETINGS: The Newport A.S. were held during the month of November, both being of particular interest to the photographer. At the first meeting, the month's four auctions of the South London and District A.S. were held, and the judging was conducted by Mr. E. R. Nicholls. At the second meeting, the month's four auctions of the South London and District A.S. were held, and the judging was conducted by Mr. E. R. Nicholls.
NEW SOCIETIES

On the 11th November the Gosport & District A.S. was formed at an inaugural meeting attended by 26 local enthusiasts. Apart from the business of electing officials and deciding policy, the new Club was given a talk on fishkeeping practices by Mr. J. Davison, Chairman of the Portsmouth A.S., who also gave some invaluable guidance on the organisation and running of a new Society. Although as yet the Club does not have a permanent meeting-place, new members will be most welcome and can obtain further information from the Secretary, Mr. H. Hawes, F.F.A. Mem, H.M.B. Droxford, Lewes, Sussex.

A new Society has been formed to cater for all aquarists interested in marine subjects, both tropical and coldwater. The Society aims to increase the number of aquarists interested in this aspect of the hobby, and to promote the study of marine life, and will also attempt to support all other clubs including marine classes in open shows. Please address all enquiries to—Mr. G. H. Jennings, The Marine Study Aquarium, 51, Park Road, Bromley, Kent.

RECENTLY an Aqueous Society was formed in Hereford and is known as the Hereford and District A.S. The year’s inaugural meeting was held on Sunday 14th December at 3.30 p.m. in the Hereford School, Hereford. Anyone interested in joining the Society will be very welcome at the meeting or should contact the Secretary, Mr. R. E. B. Young, 47, Prospect Walk, Empingham, Hereford.

An inaugural meeting was held recently to form the Valley A.S. The Society is open to everyone interested in this fascinating hobby and its main aim is to attract people from the Ramsbottom, Elandon, and Rawtenstall areas. The meeting was attended by ten members. The officers elected for the first year were—Chairman, Mr. F. Taylor; vice-chairman, Mr. J. Butterworth; Secretary, Mr. J. M. Isherwood; treasurer, Mr. R. N. Black. Meetings will be held at Mr. G. Isherwood’s Red Tail Black Shark. Mr. J. Butterworth gave a talk on coldwater aquaria, after which a fish section was held.

It was decided that meetings would be held every other Monday at the Manor Arms, Ramsbottom at 8 p.m. Further information can be obtained by applying to the Secretary, Mr. J. M. Isherwood, 4, Belvoir St., Ramsbottom, Lancs.

OBITUARY

It is with deep regret the Testock & District A.S. have to report the untimely death of Mr. George Newey, on 2nd November 1953. He was an enthusiastic member of the Society and a well-known supporter of Open Shows. He will be greatly missed by everyone.

Crossword Solution

http://example.com/crossword-solution

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by Ferenc N. Ghidiu

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December, 1965
BUYERS’ GUIDE

The firms listed are wholesalers or retailers or both in fishes, tanks, plants, appliances and accessories, reptiles and amphibians. Abbreviations: W.—Wholesale only. R.—Retail only. WR.—Wholesale and Retail. C.—Coldwater. T.—Tropical. P.—Plants. AA.—Appliances and accessories. R.A.A.—Reptiles and Amphibians. E.C.D.—Early closing day.

BERKSHIRE

The Reading Aquarist
64, King’s Road, Reading
Telephone: Reading 53632
E.C.D. Wednesday. R. C.T.P.A.A.

CHESHIRE

Glassby, Joe, F.R.H.S.
“The Glen” Fisheries, Mobberley, Nr. Knutsford
Tel.: Mobberley 3272 W. C.T.P.A.A. R.A.A.

CORNWALL

Marine Facilities Ltd.,
Commercial Buildings,
Custom House Quay, Falmouth
Telephone: Falmouth 88
E.C.D. Tuesday (in winter) R. T. P. A.A.

DEVON

Plymouth Tropicals
127, North Road, Plymouth
Telephone: Plymouth 62663
Closed Wednesday. R. C.T.P.A.A.

DURHAM

The Fish Bowl
Burdon Road, Sunderland
Telephone: Sunderland 71026
E.C.D. Wednesday (All day), R. C.T.P.A.A. R.A.A.

Metcalf, G. R.
182, Northgate (near Minories Garage)
(On main A.1 road) Darlington
Telephone: Darlington 5991

POWELL, M.C.
The Honest Pot,
Claypath, Durham City
Telephone: Durham 2108

ESSEX

Goodmayes Aquaria
70 Grove Road, Chadwell Heath
Telephone: Goodmayes 2994
E.C.D. Thursday. R. C.T.P.A.A.

Skitton, G. J., Aquarist
159, Gallewood Road,
Chelmsford
Telephone: Chelmsford 56878
E.C.D. All Day Saturday. W. C.T.P.A.A.

GLOUCESTERSHIRE

Patricia Preece (Prop. Mr. B. R. James)
10, Suffolk Parade, Cheltenham
Telephone: Cheltenham 24940

HAMPSHIRE

Arundel Aviaries & Fisheries
241/243, Arundel Street, Portsmouth
Telephone: Portsmouth 20087

Hughes Aqueus
56, Gorgon Avenue, Gosport
Telephone: Fareham 4781
E.C.D. Wednesday. R. C.T.P.A.A.

Wingate Zoological Supplies
7, Market Street, Winchester
Telephone: Winchester 2406

KENT

Gillingham Pet & Aquatic Centre
(Proprietors F. & E. Alderman)
125, Canterbury Street, Gillingham.
Telephone: Medway 53049
E.C.D. Wednesday. R. C.T.P.A.A.

Kingfisheries Aquarium
134, Cowdron Road, Beckenham
Telephone: Beckenham 3716
E.C.D. Wednesday (all day). R. C.T.P.A.A.

Medway Aquariums
314, Canterbury Street, Gillingham
Telephone: Gillingham 52158
E.C.D. Wednesday. R. C.T.P.A.A.

Shawcross Pet Stores
(Trafford Park Aquaria, Ltd.),
522, Sherwood Park Avenue, Sidcup
Telephone: Sidcup 7217

LANCASTHIRE

Hornby’s
Trafford Bar, Old Trafford, Manchester, 16
Telephone: Trafford Park 3089

Liverpool Aquaria Company
23, Sir Thomas Street, Whitechapel, Liverpool, 1
Telephone: Central 4691
Closed Wednesday Morning. R. C.T.P.A.A. R.A.A.

LONDON (East)

Wade Aquatics
333, High Street North,
Manor Park, E.12
Telephone: Grangeground 6332

LONDON (North)

The Aquarium,
9, Gougham Road,
London, N.19
Closed by arrangement only. WR.T.C.P.

Philip Castang Ltd.
72, 81, 95, Haverstock Hill,
Hamptead, N.W.3
Telephone: Primrose 1842 and 9452
LONDON (South)
Fairhawns Aquarium, Ltd.
15, Well Hall Parade, Eltham, S.E.9
Telephone: Eltham 3959
Petfish
554, Garratt Lane, S.W.17
Telephone: Lakeside 2805
Closed Wednesday. R. C.T.P.A.A. R.A.A.
South Western Aquarist
2, Glensborough Road, Trinity Road,
Upper Tooting, S.W.17
Telephone: Balham 7334
E.C.D. Wednesday. WR. C.T.P.A.A. R.A.A.
Tachbrook Tropicals Ltd.
244, Vauxhall Bridge Road, Victoria, S.W.1
Telephone: Victoria 2179
(Open all week except Sundays).
WR. C.T.P.A.A. R.A.A.

LONDON (West)
Aquapets
17, Leeland Road,
West Ealing, W.13
Telephone: Ealing 3274
Owen Reid's, Aquarium Dept.
12, Spring Bridge Road, Ealing Broadway, W.5
Telephone: Ealing 3293
E.C.D. Wednesday. WR. C.T.P.A.A. R.A.A.

NORTHAMPTONSHIRE
The Aquarium
52, Wellingtonborough Road,
Northampton
Telephone: Northampton 34010
E.C.D. Thursday. R. C.T.P.A.A.
The Pet Shop
120, Kettering Road,
Northampton
Telephone: Northampton 38841
E.C.D. Thursday. R.C.T.P.A.A.

OXFORDSHIRE
The Goldfish Bowl
9, East Avenue, Cowley Road,
Oxford
Telephone: Oxford 41825
E.C.D. Thursday. WR. C.T.P.

STAFFORDSHIRE
Walsall & Wolverhampton Aquatics
46, Stafford Street, Walsall and
147, Horley Fields, Wolverhampton
Telephone: Walsall 31783 and Wolverhampton 24147

SURREY
Aquapets
1, Grand Parade,
Teddworth
Telephone: Elmbridge 0678
Thameside Tropicals and The Pet Shop
Bracey House, New Zealand Avenue,
Walton-on-Thames

SUSSEX
Dowding, Conrad A.
1, St. John's Terrace,
Lewes
Telephone: Lewes 3970
E.C.D. Wednesday. Open until 8 p.m. Fri. & Sat. R. C.T.P.A.A. R.A.A.
Preston Aquarium
44, Beaconfield Road, Brighton
Telephone: Brighton 681602
(Open all week). R. C.T.P.A.A.
Regency Pets Aquaria (Prop. R. A. Bussett)
23, Surrey Street (outside Brighton Station),
Brighton
Telephone: 29940 R. C.T.P.A.A. R.A.A.

WARWICKSHIRE
The Coventry Aquarist (Prop. W. Dymond)
43, Malbourne Road, Earlsdon, Coventry
Telephone: Coventry 72772
E.C.D. Thursday. WR. C.T.P.A.A.

WORCESTERSHIRE
The City Aquaria, Bird and Pet Supplies
(Proprietor: Mrs. M. Hemming)
34, Friar Street (opposite Union Street), Worcester
Telephone: Worcester 22005

YORKSHIRE
The Corner Shop (Prop. J. Wilde)
526, Abbeydale Road, Sheffield, 7
Telephone: Sheffield 54172

SCOTLAND
Aquarists' Rendezvous
164/168, Albert Drive, Pollokshields, Glasgow, S.1
Telephone: South 4258 WR. C.T.P.A.A.
P. N. Greening
176, Blackness Road, Dundee, Co. Angus
Telephone: Dundee 66409
E.C.D. Wednesday. R. C.T.P.A.A.

NORTHERN IRELAND
Ulster Aquatics
15, Montgomery Street, Belfast
Telephone: Belfast 27144
E.C.D. Wednesday. WR. C.T.

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