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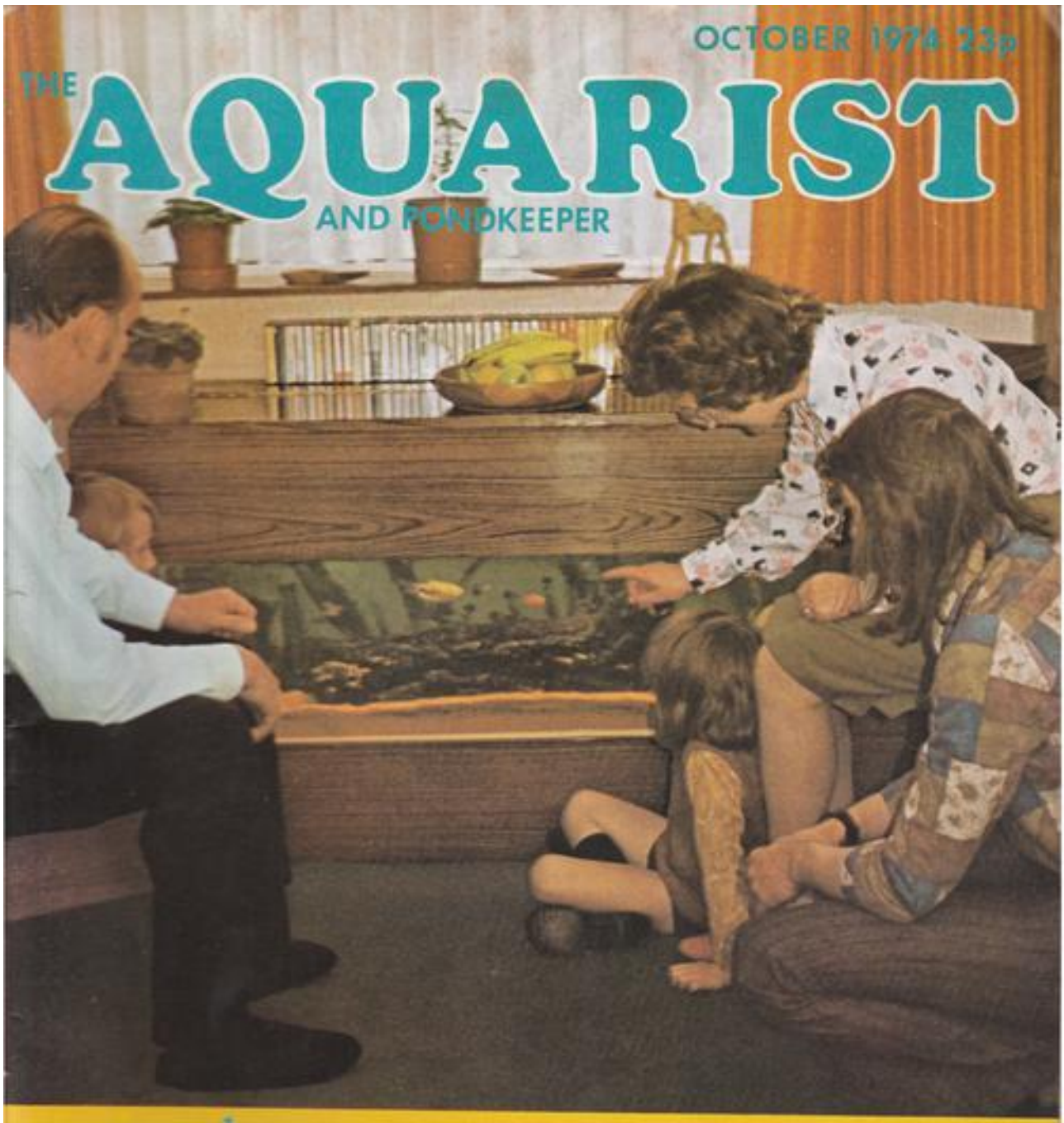
THE AQUARIST AND POND KEEPER



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THE AQUARIST AND PONDKEEPER

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ABC

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E. J. Hope, Esq.

The Editor accepts no responsibility for views expressed by contributors.

THE DISCUS FISH

by Eberhard Schulze

Photographs by Burkhard Kahl

I FREQUENTLY receive letters from readers of this magazine asking for detailed information on the maintenance and breeding of the Discus fish. Although almost all of them state that they consider themselves as experienced tropical fishkeepers, they say that they have great difficulties in keeping this fish alive for any length of time. The ensuing correspondence almost always reveals that they are completely unaware of the basic requirements needed by these fish. Discus fish have now been kept in aquaria for a good number of years but it is most unfortunate that some of the successful hobbyists or breeders have felt the need to retain their knowledge—how else could one possibly explain the lack of genuine information in the many English language publications? Our present-day knowledge about Discus fish is almost exclusively based on the success or otherwise of some of the German hobbyists or breeders,

notably Günther Keller, M. Weingarten, Dr. Eduard Schmidt-Focke and Dr. Rolf Geisler, who have, through their studies and experiments and their willingness to publish their findings, given the average enthusiasts reason to believe that the keeping of Discus fish need no longer be a lost cause.

Any would-be Discus keeper willing to devote some time to learning their particular requirements and able to provide continuous care and attention, will succeed; but enthusiasts—and there are still some—who just fill a container with a drop of tap water and expect these fish to survive are bound to fail.

Although Discus fish are no longer considered to be problem fish, they remain a somewhat demanding species and in order to be successful it is, perhaps, necessary to know a bit about their natural habitat, to understand the basic terms like hardness and pH, to be able to recognise unnatural behaviour, ailments and diseases. But it is even more important to be able to provide any environmental conditions called for: changes in hardness and pH of the water, the removal of any excess of nitrites from the water with a nitrite-removing resin or with a biological filter. Another equally essential requirement for the health and well-being of these fish is a varied and well-balanced diet. By carefully following these points enthusiasts will find that keeping Discus fish will no longer present any of the problems so often associated with them; but hobbyists who are not able to provide these conditions will generally find that keeping Discus fish will become a rather disappointing and expensive experiment.

Discus fish are a South American species and are found over a wide area of the large Amazon river and its many tributaries; they have never actually been caught, however, in the main stream of these rivers, but only where nature has created gently flowing backwaters or lakes. Depending on the time of year, these waters have a varying degree of hardness, pH and temperature which suggests to some authorities that Discus fish are quite capable of adjusting easily to changes in their environmental conditions. Dr. Rolf Geisler, perhaps best known to hobbyists as the author of the book *Wasserkunde fuer die aquaristische Praxis*, is also recognised as one of the leading Discus experts of our day. He was the first to publish comprehensive scientific data about the various known Discus biotopes and according to him these waters are very soft (Total hardness 0·0°-0·27° DH, with a Carbonate hardness 0·03°-0·2° KH and a very low conductivity (7·7-

Photograph on previous page shows a group of Young Blue Discus *Symphysodon haraldi*

Right: *S. discus*

22 uS). This water could very well be compared with our commercially available distilled water. The acidity of these waters varies between 5·7 and 6·2 pH. These waters are very slow flowing and are never much deeper than 2 metres and the average temperature is approximately 29°C (84°F), but as some of these fish have also been caught in waters with a temperature as low as 24·5°C (76°F), some experts have come to believe that it is not absolutely necessary to keep these fish at the previously recommended high temperatures of around 29°C (84°F) to maintain their well-being and many hobbyists have found no deterioration in their behaviour, coloration or general state of health by lowering the temperature a few degrees. The water of these Discus fish "rivers" are usually a mixture of the clear water type and the black water type. The black water is coloured brown by humic substances which have dissolved out of the many trees and plants and is usually quite murky which seems to indicate that Discus fish prefer to live in semi-darkness. These rivers have no plant life as such and Discus fish will invariably be found in places where tangles of tree-roots or fallen tree-trunks with their branches provide some shelter and security.

Another and often discussed aspect which has fascinated most serious Discus enthusiasts for many years is the kind of food available to them in nature. We know that foods like *Tubifex*, *Daphnia*, Whiteworms, etc., are not found in these regions. As a result of the ceaseless efforts by Dr. Rolf Geisler, we now know from tests he was able to carry out on newly-caught specimens that Discus fish feed on the *larvae* of a one-day fly (*Campsurus*). It seems that these *larvae* occur in great numbers and possibly constitute their main diet. Several species of a small and soft-skinned freshwater shrimp (*Macrobrachnum*) were also found in the same proximity but it could not be established whether these also form part of their diet. So far these are the only two known foods found in their natural habitat and it seems likely that Discus fish feed on them during the dry season. Whether the high waters during the rainy season bring with them any other suitable food is as yet not known. It is also not clear as to what constitutes the main food for young Discus fish and we have to wait until this can be established. But as aquarium-kept Discus fish seem quite happy and can be kept in generally healthy conditions with the foods we are able to provide, these answers will only be of academic interest. No Discus fish enthusiast need ever fail because of want of a suitable substitute food.

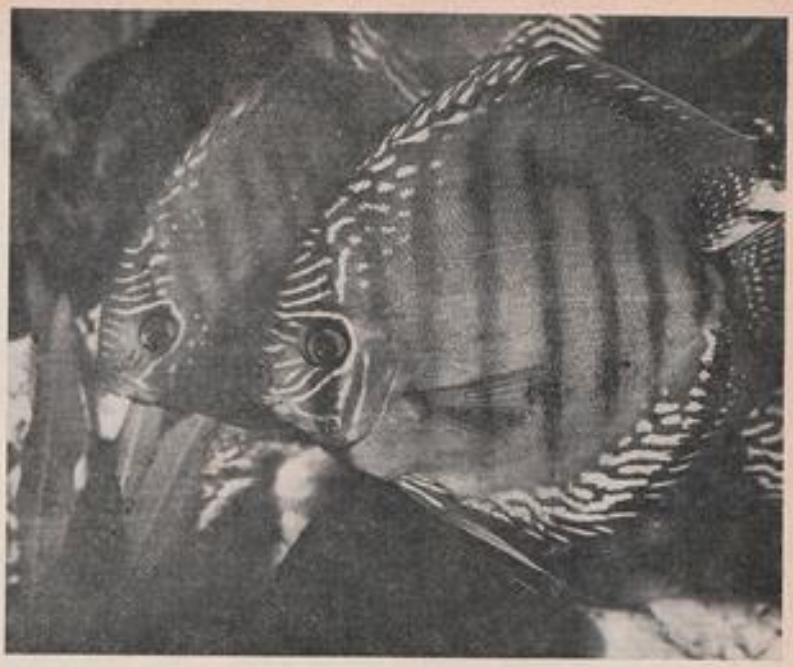
Discus keepers will have noticed and felt confused by the many different names under which these fish are usually offered for sale and when (as I very frequently did) they try to check certain information in the available literature, a definite answer is rarely found. Of course, it could be so easy if only wholesalers, retailers and enthusiasts were willing to name fishes and plants by their Latin names as is common on the Continent and in most other fishkeeping countries. Most hobbyists might be surprised how quickly one could learn these apparently difficult-sounding names and at least one would know that a "spade is a spade." Take, for instance, the case of the fish *Symphysodon discus* Heckel 1840. This fish is also known as: Heckel Discus, Genuine Discus, Real Discus, True Discus, Disc Cichlid, Pompador fish and possibly others I have never even heard of. It is not surprising, therefore, that some would-be Discus keepers might easily lose heart and I feel it should be the responsibility of editors of publications as well as their contributors to see that a certain amount of order is created out of this confusion.

It is not my intention to present a scientific classification of the genus *Symphysodon*, but rather advise enthusiasts to familiarise themselves with the classification made by Schultz 1960 which is today generally recognised (by most but not all experts). According to him there are two species with their sub-species:

(1) *Symphysodon discus* Heckel 1840 (Heckel Discus);

(2) *Symphysodon aequifasciata* with their sub-species;
Symphysodon aequifasciata axelrodi Schultz 1960 (Brown Discus);
Symphysodon aequifasciata haraldi Schultz 1960 (Blue Discus);
Symphysodon aequifasciata aequifasciata Pellegrin 1903 (Green Discus).

All other varieties like the Red Discus, Cobalt Blue Discus, Turquoise Discus, Seven Colour Discus, Blue-Faced Discus or Royal Blue Discus are named by breeders or collectors. The Red Discus is a "wild" species and has so far not been recognised as a separate species or sub-species. The overall coloration is slightly more red and there are also a number of red markings covering the body. It is generally thought that the Red Discus is a "differently" coloured Brown specimen. The Royal Blue Discus, so named by the collector Willy Schwartz/Manus-Brazil is always found in the company of the Blue Discus; it is basically a Blue Discus but the overall coloration is more intense and the markings cover the whole of the body. The Cobalt Blue or Turquoise Discus are sports and are the results of extensive line-breeding probably from different coloured Blue Discus fish by some American breeders. As far as the Seven Colour or Blue-Faced Discus are concerned, these are mainly Far Eastern tank-bred varieties. Their coloration is due to an early extensive feeding of certain hormones. As these colours will not appear in the young from such stock it must be said that the sale of such fish has no other purpose but to make a bit of extra money for those breeders who would otherwise have to sell these fish



Brown Discus
S.aequifasciata axelrodi

for what they really are—the cheaper and common Brown Discus fish. The Brown Discus fish is the one most often found in the tanks of dealers and hobbyists. It is perhaps easier to maintain and breed, but for sheer beauty it must always take second place to any of the other varieties and it is hoped that in the near future some dealers will find it as profitable to sell the much more beautiful and rare varieties of this genus.

The first conflict usually arises from the moment we decide to set up a Discus aquarium. Most hobbyists will have heard or read that these fish should be kept in a bare aquarium, but there are probably not many hobbyists who would want such a set-up in their living room. I also doubt whether mothers or wives would be enthusiastic about it—perhaps only the most understanding would be willing to tolerate such a "thing."

I feel that the deciding factor whether to keep these fish in a so-called "clinical" environment or whether they should be kept in a decorated aquarium, should always depend upon what the hobbyist intends to do with his fish. If his main aim and ambition is to raise these fish in order to breed them, then he would be well advised to keep them in a "clinical" aquarium. But if the hobbyist only wants to display his fish as part of a nice room setting and wants something attractive to look at I can see no valid reason why they could not be maintained in a decorated aquarium.

On whatever set-up the hobbyist finally decides, it goes without saying that all the equipment should be of good quality and reliable. The aquarium to house the fish (which will attain a size of about seven inches when fully grown) can be as large as possible. But no aquarium smaller than 48 inches by 18 inches by 18 inches should be considered as their permanent home. For the "clinical" set-up the only other pieces of equipment needed are a heater and thermostat or heater/thermostat combined, a thermometer, a filter, an aquarium cover, a source of light and a bottom covering. For the bottom covering the hobbyist can use either a thin layer of a dark-coloured gravel (which must be siphoned out at regular intervals to be freed from accumulated dirt) or a sheet of matt-black perspex. The perspex is cut slightly smaller than the base sheet of the aquarium and is glued to the four sides of the aquarium with a silicone sealant. By using perspex rather than gravel, the bottom of the aquarium can be kept clean without too much effort. If desired, the hobbyist can also provide the fish with one or two plants. These should be planted in little plastic flower pots; they should be of an undemanding variety, fast-growing and able to withstand the high temperature needed by the fish. For best results I advise enthusiasts to plant a few bulbs of one of the *Nymphae* varieties in a plastic flower pot and within a very short time a good-sized plant will have developed. The large floating leaves will cut down some of the light and will give the fish some security and a place to hide when being disturbed. Such a "clinical" set-up has the advantage of being less work, easier to maintain and control and Discus fish—my Discus fish at least—seem as happy and healthy as I would wish them to be.

But, if it were decided to keep these fish in a decorated aquarium, we should aim to copy as closely as we can their natural habitat. As these fish are only found in places where an abundance of roots or branches from trees provide them with shelter, we can take it that a close link between the two exists, and hobbyists should aim to create such a scene by using the available bog-wood roots (obtainable from Everglades Aquatic Nurseries, Baunton, near Cirencester, Glos.). Only roots which are completely dead must be used; they should be thoroughly cleaned and kept in a boiling salt solution for at least one hour. If it is impractical to do this, then they should at least be soaked in as hot a solution as possible for a few hours. This will kill all germs, bacteria, etc., which one would not want to introduce into one's aquarium. After the salt solution "treatment" the roots should be soaked in clean water, with as many water changes a day as time will allow, for about two weeks. By this time they will have absorbed sufficient water to make them heavy enough to stay at the bottom and will also no longer release large amounts of humic acids. There is no point in rushing this job; the more carefully these roots are prepared, the longer they will last and the safer they will become. Some of these roots look fantastic and any aquarium decorated with them will look very attractive. These roots should be considered to be the main decorating material for a Discus fish set-up. The gravel should be of a dark colour, lime-free and used in a thickness to support the plant life. Although stones or rocks are alien to their natural habitat, if they are used they should be small and free from sharp corners or edges. The aquarium should be planted with an undemanding and fast-growing variety of plants and the various Amazon Sword plants (*Echinodoras*) probably fulfil these requirements best. Also the use of some large floating plants is advisable to cut down the intensity of the light. As these fish seem to prefer to live in semi-darkness, it is essential for the hobbyists to provide the conditions. Enthusiasts will have noticed that Discus fish display their most brilliant colours in an unlit aquarium; surely this must mean something. As most aquaria receive their light from above, it is not surprising that these fish become dull and easily frightened and many hobbyists are completely ignorant about their magnificent beauty. I feel it is of great importance for Discus fish keepers to experiment with the arrangements of the lights. Difficulties will usually arise: when the fish are doing well and display themselves to the greatest advantage while the plants fade away. But to make the plants grow well by giving them the necessary amount of light will cause the fish discomfort. Hobbyists must try to achieve a balance to satisfy the needs of both: enough illumination for the plants, but also enough dark corners for the well-being of the fish.

Another and equally important point with which the enthusiasts must experiment when setting up a Discus fish aquarium is the installation of the filtering system. It has always been said that Discus fish do best in a "super" clean water and it was suggested that a power filter be used. A big power filter is required to keep the large volume of water reasonably free of suspended dirt particles, but such a power filter also creates a current and I have noticed that Discus fish do not take kindly to such a water. If the current is too strong, the fish seem to fight against it and as a result stay motionless in one place. But as soon as the power filter is switched off, they will start to glide gently through the whole of the aquarium. To overcome this problem the return pipe must be installed so as to enter the aquarium in more than one place—two or even three points just below the water level all along the back side of the aquarium. If the power filter can be installed in this manner the return will create very little current and still keep the water crystal clear. I have also noticed that some hobbyists are not familiar with the function of the various filtering media. The most frequently used materials are Polymer wool or carbon. I also understand that most enthusiasts give their fishes a peat extract at fairly regular intervals to cause a black-water type of environment, while at the same time filtering the water religiously with carbon. This is rather pointless, for carbon will remove these expensive peat-extracts, as well as removing organic substances resulting from food decomposition and fish wastes; incidentally, it will also remove any chemicals or medicines added for the treatment of ailments and diseases, cloudiness, discoloration and smells. The only time a carbon filter should be used is when the hobbyist needs to remove any excess of substances as a result of a heavy peat filtration or for the removal of unwanted chemicals after treating the fishes for a disease.

Polymer wool is probably the most often used filtering material. It will keep only suspended matter back. It should be changed every week or two, or after cleaning in warm water, polymer wool can be used several times.

There are a great number of other filtering media available to hobbyists; some of them I have been using for many years and some are only "recent" discoveries, but all of them I have found to be of great help in making a sometimes difficult task that much simpler. Hilena's Depotfilter or Eheim's Ehfimech is a new concept type of ceramic filtering medium. Its advantages are that it can be used for a very long time (up to six months) before it has to be cleaned, and in theory will last for ever. Another suitable filtering medium for a Discus fish set-up is Hilena's Porenfilter or Eheim's Ehfisubstrat; this is a porous material on which bacteria will settle and break down biologically waste materials from the water. But without any doubt, peat is generally considered to be ideal as a

filtering material for Discus. It will impart biological substances, it will soften the water and also lower the pH, and as far as I know is used by most serious Discus fish breeders all over the world.

The installation of my filtering system for my large Discus aquarium might be of some interest to some hobbyists and for those I will give a short description; it works well and some enthusiasts might very well want to try to copy it: I use an Eheim 476 power filter as well as a second 476 container with lid. The water from the aquarium enters the first container (without motor)—which is filled only with Hilena's Depotfilter filtering material—at the bottom inlet. A short piece of plastic tubing is connected from the top outlet to the bottom inlet of the second container (with motor). The second container is usually filled with Hilena's Aktivtorf or Eheim's Ehfitorf Stark to create a certain water quality or with Hilena's Filtertorf or Eheim's Ehfifaser Mild to maintain the achieved quality of the water. The filtering material in the first container is cleaned every five to seven months and the peat is renewed every four weeks. The water from the aquarium passes through both containers and returns to the aquarium at three different points. I have used this system for many years and found it most satisfactory. The Eheim 476 power filter gives the required turnover but the placement of the three return points creates only the gentlest of currents and, as far as I can judge, my Discus fish seem happier now than when they were with the installation normally recommended.

Discus food. When young these fish will accept any given live food such as *Daphnia*, *Tubifex*, Bloodworms, Whiteworms and Glassworms; they will also feed on any good quality flake food. Another excellent food which is easily available is Oxheart and liver. I have for many years now been using a home-made food which consists of Oxheart and liver, Codroe, Spinach, TetraMin flakes and a Vitamin complex. "Different" kinds of these foods could be made by varying the ingredients but Oxheart should always be used as the main substance. All this is blended in a mixer and then frozen. Small pieces are easily cut off and are eaten by all my Discus fish. Even newly acquired fish which have never eaten such food will usually take to it without any difficulty. Fully grown specimens are a bit more fussy about their fare; they will not take *Daphnia* except perhaps only the largest kind and are also not too keen on dried flake food (although it is sometimes taken). But as there are a great number of suitable foods available, the feeding of Discus fish should no longer present any problems. They should be given a different food every time at least four to five times a day—and fish fed like that will reach sexual maturity earlier—in about one year. But if they can only be fed twice a day, their growth will be considerably slower and maturity can only be expected at about two years. The feeding of all live foods must be done with caution since through them bacteria and disease can be introduced into the aquarium.

Finally, let me say a few words about Discus fish water. It has always been stated that these fish require a soft and acid water. This is certainly true if one wants to breed these fish, even though there have been some reports that they were successfully spawned in hard water (18° DH). These statements should be regarded as an exception rather than the rule. To induce a sexually mature pair to spawn, a hobbyist should try to provide water with a hardness of about 3°-6° DH, and the pH should be around 6. This water has proved to be the most acceptable one—to the fish—and if it can be provided it is usually only a matter of time before the fish are willing to perform the fascinating—and certainly worthwhile watching—act of spawning. But to raise these fish I can see no valid reason why they should not be kept in ordinary tapwater. I now raise all my young fish in standard North London tapwater and have never noticed any difference whatsoever between Discus fish raised in tapwater or soft water. The greater availability of tapwater makes the necessary and important water changes that much easier. It could even be carried out once a day—as I do with all my young Discus fish. But, in any case, the water must be changed at least once a week to maintain these fish in a healthy state and in a suitable environment. The addition of a Vitamin complex to the water (or direct to the food as recommended by the manufacturers), good feeding and a healthy environment should keep these fish free from disease—I have found them to be quite hardy—and their longevity will give the enthusiasts a great deal of pleasure for many years.

Although it is often said that the Discus fish is not a fish for a beginner, a beginner who is aware of their particular requirements and has the patience not to demand instant results, will find that the keeping of Discus fish is not much more difficult than keeping many other varieties of tropical fish.

Record Birth

I wish to set forward a claim for the record number of live young produced by an ovoviviparous fish. The fish in question were a pair of tuxedo swords. The female was placed in an 18 × 10 × 10 in. nursery tank on the 26.7.74 and on the 28.7.74 302 living young were produced. During the following 24 hours a total of 114 of the fry died. These appeared to be mainly red-eyed red and normal red young. The "birth" was witnessed by my wife and I, and the count was verified by Mr. A. Moore, Treasurer of Basford and District A.S.

G. A. GUEST, *Manager*,
Pisces Tropicals,
Nottingham.

The Golden Jubilee of the Aquarist & Pondkeeper

The first issue of the "Amateur Aquarist," as it was then called, was published by Mr. A. E. Hodge in 1924, and was the first regular publication of its kind in the world.

Mr. Hodge was a devoted Naturalist, and finally became dedicated to fishkeeping, and the publication of his magazine. He was also a pioneer in the field of showing fish, and was responsible for the first large public fish exhibition, which was held in Fetter Lane, London, in 1926.

Mr. Hodge came to an untimely death in the latter half of 1936, due to a heart attack, and the "Aquarist & Pondkeeper" (incorporating the Reptilian Review) as it was then known, was carried on by his daughter, Violet.

The Buckley Press, who were the printers of the "Aquarist" even in those early days, finally took it over, and became its publishers as well.

The Federation of British Aquatic Societies was founded in 1938, by similarly devoted aquarists, in another effort to bring the whole of the country together in common pursuit of the hobby of fishkeeping.

Similarly, too, it was the first organisation of its kind in the world, and through the years it has remained the oldest and the largest collective body of aquarists in the world with today no fewer than 190 affiliated societies.

It is fitting, therefore, that the F.B.A.S., on behalf of its thousands of individual members, many of whom are readers, should offer its sincere congratulations to the Buckley Press, and its staff on the "Aquarist," for perpetuating so successfully the original ambitions of Mr. Hodge and by bringing this magazine to its 50th Birthday.

In this field 50 not out is a proud achievement, and it is the fervent wish of the Federation of British Aquatic Societies that the second 50 will be as successful as the first.

FRANK TOMKINS,
Chairman, F.B.A.S.

It gives me great pleasure to congratulate "The Aquarist & Pondkeeper" on the occasion of its Golden Jubilee. This Jubilee could never have been reached unless those behind the scenes directing and guiding the magazine had not continually kept its readers so fully informed and interested on matters aquatic—information that was not available to the hobbyist in the same way from any other publication. The 1st British Aquarist Festival was sponsored by the A & P 23 years ago and every year since then the A & P have donated prizes and helped with schedules, catalogues and so on most generously.

A few years ago they came up with the unique idea of a "Champion of Champions" competition within the B.A.F. As with our Society Tableau the ideas are winners, so much so that there are now imitations at other shows—the greatest form of flattery I believe.

Many Happy Returns A & P and again my congratulations.

GEORGE W. COOKE,
President, Federation of Northern Aquarium Societies.

I think the fact that *The Aquarist and Pondkeeper* has reached that milestone of milestones in the aquatic publishing business of 50 years of age, is a matter of great congratulations.

We enjoy the magazine over here and although we missed much of the first 50 years (being a subscriber for only the last few years), we shall not let this happen the next 50, God willing.

So to you, congratulations, our best wishes and Thank You for a job well done.

CHARLES WONDERLIN,
Editor, Marine Hobbyist News,
205 Orr Drive,
Normal, Illinois 61761 U.S.A.

Aquaria and Heaters

FIRST, may I congratulate *The Aquarist* on attaining its 50th birthday and also for a good job done. *The Aquarist* was about seven years old before I began to take much notice of it and at that time at the age of seventeen, I was just commencing to make glass-cased aquarium heaters. You ask me to mention changes which I have seen over the years. So far as equipment is concerned there have been considerable changes. In my early days aquariums usually had slate bottoms and were heated from beneath by oil or gas and the plants grew prodigiously, presumably because their roots were warm. I still believe that bottom-heating has a lot to be said for it and, of course, if by gas or oil one has no worries when power cuts start. Bottom-heating does, however, tend to stir up the mulm, making a filter necessary.

In the early days immersion heaters had chromium-plated metal cases and could be lethal if badly connected or not earthed. I claim to have been the originator of glass-cased immersion heaters and now millions are made and sold all over the world and one seldom sees a metal-cased immersion heater.

Naturally, people were a little doubtful of these glass-cased heaters and thermostats at the outset, because they felt that there was a risk of serious electric shock, but time has proved these fears to be unfounded and, in fact, I have never yet learned or read of a case of serious shock from this source. It is not generally known that freshwater is a poor conductor of electricity and that, in any case, electricity takes the shortest path so that, should a glass heater tube break in the aquarium, the flow of electricity is between the two electrodes.

The combined heater and thermostat in one glass tube originally became popular in the U.S.A. and it was some time before they really "took on" in this country, but since 1960 they have become very popular and rightly so. In general aquarium equipment has become more sophisticated and especially during the last ten years, but to my mind the aim should be to get the equipment out of the aquarium and preferably hidden away under it in a cabinet. In this direction I feel that Messrs. Vitakraft of Germany have a very good idea. The water is taken out of the aquarium, through the filter and then through a flask which contains a combined heater/thermostat unit so that the water is filtered and heated before being pumped back into the aquarium. They claim very even heating of the aquarium by this method.

To my mind perhaps one of the biggest changes has been the advent of the all-glass aquaria which the aquarist can make for himself using silicone adhesive. As we are now aware this material is extremely strong and appears to have a life of very many years, completely unaffected by water, air, sunlight, etc., and what is more, it is completely inert and safe to use. I shall not be surprised if, when you have your 100th birthday, aquariums made now using this adhesive will be as good as ever. There appears to be no limit to the size of aquarium which can be made in this way and in fact I have seen an aquarium which was 10 ft. in length by 2 ft. 6 in. high and 2 ft. in width. Such an aquarium would hold no less than 280 gallons of water which would weigh 1¼ tons. It goes without saying that the correct thickness of glass must be chosen for such a project and the tank would have to be strapped across at the top in at least two places, but most important, it would have to sit on a very flat base. I always recommend that a sheet of expanded polystyrene (about ½ in. thick for large tanks) is placed under the tank and this will even out slight irregularities.

S. A. Singleton,
Singleton Bros. (Electronics) Ltd.

Mendel's Law

The implication of the letter July, 1974, headed "Theory and Fact", is that in the breeding of Shubunkins theory and practice widely differ. I refute this. Whilst agreeing with Mr. Boarder that Mendel's Law of Inheritance cannot be rigidly applied to all aspects of fancy goldfish breeding, my experience coincides with the views expressed by "Goldfish Breeder", May, 1974, issue.

Although the length of my experience does not compare with that of Mr. Boarder, I have bred Bristol Shubunkins for over twenty years with some degree of success and I have found in practice that about one-half of the fry from a spawning are of the same scale group as their parents, one-quarter metallic bronzes and one-quarter matt fish, mainly pink with black eyes.

In ridiculing the application of Mendel's law to goldfish breeding, Mr. Boarder is flying in the face of the experience of breeders who have concentrated on the calico varieties, as well as the work of such authorities on goldfish genetics as Dr. Matsui, Professor of Fish Culture in Japan, who has studied inheritance factors in goldfish for over fifty years.

I must also add that his thesis that losses due to infertile eggs and eggs eaten by parent fish would so distort the ratio of scale groups to each other, is mathematically incorrect and irrelevant. For as he has stated, fish and fungus are not selective in atacking eggs containing the embryos of a particular scale group. The destruction would, therefore, be broadly the same.

The essential point which I think should be made clear to newcomers to goldfish breeding is that breeding the calico type of a goldfish variety is twice as wasteful as breeding the ordinary metallic scaled type. Due to the genetic reason only half can be of the same scale group as their parents, the rest are write-offs before the real business of selection begins. If this is not known, parent fish could be wrongly rejected for producing such a low proportion of desirable fish.

K. C. Speaks,
51 Stacey Avenue,
Wolverton, Milton Keynes.

I am very concerned about the way Mendel's laws of genetics have been bandied about in the correspondence between "Goldfish Breeder" and Mr. Boarder. In the first place I feel that Mr. Boarder's original comments were adequate and could not be criticised. Secondly 'this law can be applied categorically respecting breeding fancy goldfish' and here I think that Mr. Boarder and "Goldfish Breeder" must be living in cuckoo land.

The familiar phenomenon of misquotation (and bad memory?) has raised its ugly head once more. Can Mr. Boarder be so naive as to think that he has proved

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VIEWPOINT

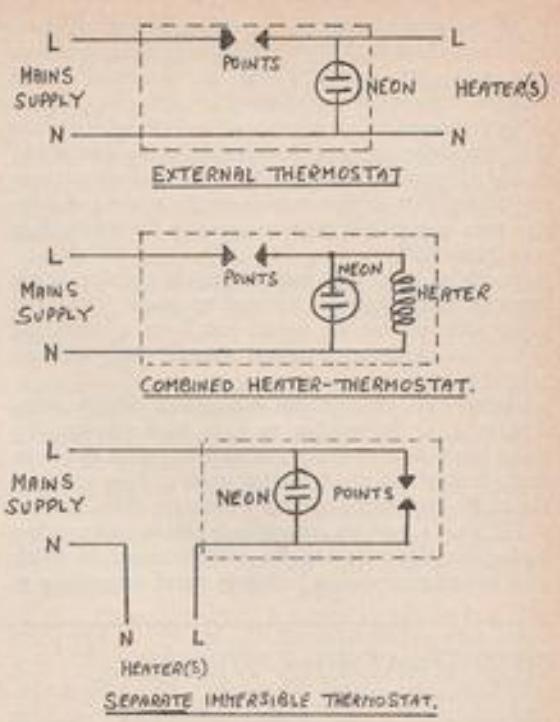
by A. Jenno

MOST aquarists will be aware of the fact that the commonly kept aquarium plants fall broadly into two popular categories, i.e. the true aquatics, and the bog or marsh plants. What is not so often appreciated is that the two groups are quite dissimilar in their way of life in the submerged state in aquaria, so that the requirements for their successful growth and propagation may also be correspondingly different. The true aquatic plants are called Hydrophytes and are represented in aquaria by *Cabomba*, *Myriophyllum*, *Elodea*, *Hornwort*, etc. Their physical structure is different to that of marsh plants in that they do not need strong stems for support as do aerial plants, and they have the ability to feed at all their contact surfaces with the water and thus they have no need of complex nutrient channels (veins?). They are, of course, completely adapted to submerged life, so much so that any piece exposed to the air will die, whereas those marsh plants which can grow in the submerged or partially submerged state may only do so from necessity rather than preference. Due to their adapted feeding methods, hydrophytes are generally able to manage without dense root systems and can so live well over base media which are poor in plant nutrients. Their other advantages to the aquarist are that they usually make thicker, bushy growth and propagate easily vegetatively with any small piece being able to develop into a complete plant under favourable conditions. Given clean water which does not clog up the feeding surfaces, they grow very fast and help to retain the water clarity by their absorption of nutrient materials, and their lush growth retards the development of free floating *algae*. The "converted" marsh plants, on the other hand, have obviously lost the benefit of any air-to-leaf surface interchange processes on submergence and so may be carrying out their aquatic life at a considerable disadvantage and so will usually be heavily dependent upon the products of a highly developed root system and thus on a properly feeding base medium. It would seem then that the beginner, and those others of us who still cannot grow mixed plant collections successfully, might be well advised to concentrate on the hydrophytes as an easier proposition. The main essentials for good growth would seem to be clean water, for the reasons already given, and the absence of voracious plant-eating fishes such as goldfish and large barbs, as due to these plants' lack of supporting tissues and fibrous "skeletons" they are completely tender and easily eaten or damaged. Obviously, they also need enough light. Their main disadvantage in aquaria is in the fluctuating effects which their well-known photosynthetic properties have on the oxygen and carbon dioxide contents of the water and the consequent variations of the pH value, due to the normal day-time-night-time light cycles. This can, however, be averaged out by providing constant artificial aeration and so need not be troublesome. Hydrophytes can usually be obtained easily from natural waters or bought cheaply. One word of warning—some dealers, or their wholesalers, store plants for quite long periods in sealed plastic bags before sale and during transport. Hydrophytes subjected to this treatment will die if too long out of water, as already discussed, so the aquarist should beware of buying half-dead stock. In my own case, Hornwort (*Ceratophyllum demersum*) is obtainable locally, so this has been included in several aquaria, particularly in those with good biological filters where the root-dependent plants will definitely not grow. When first collected it is very bushy and its colour may be brown-red or green, depending upon the shading on its pool, but in the normally illuminated aquarium it soon goes bright green, and becomes less dense at tropical temperatures. Unlike the large *Elodea* (*Lagarosiphon major*) which may survive an English winter, Hornwort dies back every year in the wild so it will be interesting to see if it still tries to follow this practice in an artificial environment. One further interesting point about Hornwort is the way in which it spreads in natural ponds. It seems that when the growth reaches the surface in early summer and large, dense "heads" lie just below the surface, the action of the wind and weather generally cause the top sections to break off of the main plant at some point below the surface. The released portion then floats about the pool, living completely free of any roots, until it either grounds in the shallows or sinks elsewhere. Thus, Hornwort ponds tend to be completely populated and are easily harvested by simply taking only the still-floating pieces from the edges.

Mr. Whiteside again brought up some interesting topics in the July issue, which bear examination in more detail. His correspondent, Mr. P. Jones of Manchester, says he would rather give away or

exchange fry than sell them to a dealer for "a pittance." This particular instance sounds like a legitimate complaint, but there are several points which prospective sellers of young fishes should consider, the main one being that just because an aquarist has produced more fry than he requires, there is no obligation on the shopkeeper's part to relieve him of the burden of their upkeep. In my experience, on both sides of this particular fence, I feel that if the dealer wants the variety offered, and is satisfied as to their size and condition, and is buying the fishes by prior arrangement, then he should pay the aquarist half the final selling price exclusive of any V.A.T. charged on that final price. Personally, I am satisfied as an amateur breeder with ten pence for a fish which retails at twenty-five pence. The aquarist who is prepared to breed and grow up fishes to a dealer's requirements is a very rare animal, and more of these would undoubtedly be welcomed by the retail trade, in place of the more usual hobbyist who merely wishes to dispose of surplus stock at convenient times and prices. Many of the easily bred fishes are just not readily saleable in quantities, or if they are then a dealer will generally already have stocks from more consistent sources, so the aquarist who arrives suddenly in a shop with a hundred Zebras or Convict Cichlids, for instance, often of mixed sizes and/or ages, should not be surprised if he meets little interest. Many of the fishes taken by dealers are finally fed off to larger fishes or given away to small boys because they are fit for nothing else. No doubt some dealers are unscrupulous, but we must avoid the tendency to blanket them all with the same accusations. After all is said and done, it is pretty well impossible to give another amateur aquarist, say, fifty fishes of the same species at once, let alone make an exchange for them. I sympathise with Mr. Jones if his dealer's profit margin is as great as he implies, but surely any good home-produced fishes, particularly livebearers, will command decent prices elsewhere, especially in a city such as Manchester?

The "psychology of the neon indicator bulb" is another interesting topic and can do with explaining for the benefit of those who are not electrically minded. It does not matter what make of thermostat is used, as we are involved in a question of simple electrical principles so that all of the manufacturers must follow the same pattern under similar conditions. In order to have a neon indicator *on* when the thermostat is switched *on*, it is necessary that one side of the neon be connected to a live wire and the other side to a neutral, like any other light bulb. This is only possible in an external thermostat or a combined heater-thermostat where the neutral wire is present in the same "container" as the neon. It is then simply connected in parallel across the heater wiring and responds with the heater to the thermostat's signals.



In the case where the neon is *off* when the thermostat is *on*, this has to be done because this occurs when the neon is mounted inside a separate immersible thermostat which only has two switch wires coming from it. When the thermostat is *on*, both of these are live wires and so the neon, which is connected between them and thus has no difference in supply across it, does not light. At that time it is also, of course, shorted out by the thermostat points which are closed. When this type of thermostat opens and the heater goes *off*, the supply side of the thermostat, and hence one side of the neon will remain live, but the other contact and the other side of the neon will be connected to the neutral *through the heater windings* and sufficient voltage difference will exist across the neon for it to light up. This sounds a little tricky but works well in practice and the principle has been used for some years. It is confusing for the aquarist with several types of thermostats, but the main thing to remember is that if a separate thermostat has only two single wires or one double wire leading into it, then any included neon can only be *on* when the thermostat is *off*. An external thermostat would have its neon on when calling for more heat whether the heater was connected or not, as must have happened in Mr. Whiteside's instance, because in this type the neon is only indicating the condition and action of the thermostat. If we then infer that the heater is on because the neon is lit, this need not necessarily be so

as can be seen. Reference to the aquarium thermometer would eventually show a lower temperature than was usual while the neon was on, and from this it could be correctly assumed that the heater was broken or disconnected. The trouble with these indicators is that in practice they tend to encourage the aquarist to ignore his thermometers, or least not to look at them very often. It is far better to know the actual temperature than it is to just assume its value because a light goes on and off.

Finally, it is all very well criticising the five or six pages in the magazine devoted to show news, but surely without this we would just have a magazine which was five or six pages thinner and with no benefit at all.

During this year of the magazine's fiftieth anniversary, it is informative to look back through the older issues and to make comparisons with the state of the hobby and the magazine itself in days gone by. My oldest copy is the issue of February, 1949, Volume XIII, No. 11, and by coincidence this is more or less the halfway point since the establishment in 1924. The advertisements are probably more interesting to us now than the actual text. Surprisingly, in these days of galloping inflation, I would estimate that it cost not much more to set up a particular size freshwater tropical aquarium now than it did then, and surely the quality of the purchases must have generally improved. A good example is the simple immersion heater priced at 16/3 in 1949 and 72p today. It would seem that we are on to a good thing by comparison. Fishes were advertised as "pairs," but whether this meant a sexed pair or just two, is not obvious. In either case, with Angels at 15/- to 100/-, Nigger Barbs at 20/-, and *Corydoras paleatus* at 60/- (all "pairs"), we are not doing too badly in the present day. Some old friends in the equipment world are in evidence, the notorious Worm Shredders (to quote: "This is not a toy or a pretty gadget but a serviceable tool"—too true), and the good old Leon Compressor. In this instance the big one with double coils and pistons is illustrated, which could blow up balloons with no trouble at all. In spite of its oiling and stopping/starting requirements it was a nice thing to have about and was in fact something of a status symbol at the time.

OUR READERS WRITE

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one of the basic laws of genetics wrong? The two factors in Mendel's laws that both Mr. Boarder and "Goldfish Breeder" have omitted are: that figures given from Mendelian calculations are *Probabilities*; that these calculations concern genotypes and not phenotypes.

I do not intend to "improve" Mr. Boarder's education in this letter but I hope soon to be submitting an article on genetics, which I have just finished. Being a subject which is misunderstood by so many people I hope that my article will clarify the situation.

In the meantime, I would like to demonstrate the necessity of inserting the word probability into Mr. Boarder's argument. Supposing his (erroneous) X, Y and XY were reared, then the probability that one of these fish was an X is ¼, Y is ¼ and XY is ½. As Mr. Boarder says, the parents "will eat the eggs at random" and all the other losses mentioned by Mr. Boarder are random. As these are random they do not affect probability. Incidentally, the X, Y and XY and "Goldfish Breeder's" nacreous, metallics and matts show their confusion of genotype and phenotype.

The last point in Mr. Boarder's letter concerned whether Mendel ever intended to apply his findings to other organisms. May I humbly suggest that this was the whole point of Mendel's experiments.

R. J. Davis,
39 The Drive,
Sevenoaks,
Kent.

Explanation

I have been asked by the committee of the Southampton Aquarist Society to answer the letter from Mr. R. J. Moody in your July edition.

I am glad that Mr. Moody enjoyed our show so much in 1973 to prompt him to come again this year. As he will no doubt know, ours was one of the first shows this year to be judged to the new size graph and, of course, this takes a little longer to judge each fish. On organising the show this was taken into consideration and eight judges were booked. Unfortunately, through various reasons, on the day we were three judges short. This being so, I think the judges did a marvellous job to get finished when they did.

I must apologise to Mr. Moody and, indeed to anyone else kept waiting so long to get in. I am sure that now they know the reason for the delay they will be a little more understanding.

The judges are now being booked for the 1975 show. We have "booked" ten so there should be no hold-up next year. Please "make a date" for Easter Monday.

If Mr. Moody is at the show and cares to make himself known to me, I shall be pleased to buy him a coffee. I'm afraid it's the strongest we have to offer.

D. V. Jones, *President*,
Southampton A.S.,
"Firs Farm",
Curdridge, Southampton,
Hants.

PRODUCT REVIEW

Control-O-Mat Thermostatic Heater, manufactured by Singleton Brothers (Electronics) Ltd., Truro Hill, Penrhyn, Cornwall. Price unknown at time of writing.

With the test sample of the Control-O-Mat sent to me for review purposes, I received also a letter from the managing director of Singleton Bros. Ltd., Mr. S. A. Singleton. He writes: " . . . We felt that you may be interested in our modified Control-O-Mat for which we claim a world first, for not only is it completely submersible, but also it has an outside control knob. So far as we are aware, the nearest competitive model has no control knob but adjustments have to be carried out through a sleeve and it is a fiddling job; also it is possible to go completely round through 360° and thus completely upset the range. Our model has end stops and is calibrated.

"You may be interested to learn that we claim to be the first manufacturer in this country to take combined units seriously and in fact as long ago as 1956 we produced our Dial-O-Matic combined unit which sells in great numbers all over the world, and especially to Hong Kong. A little later we produced our Preset-Matic unit which is very similar to the Uno (combined heater and thermostat, reviewed in the July issue) model and is the forerunner of this type of combined unit. We are in fact on a very friendly basis with Mr. Ellson of Uno and we mould the suction holders for them and for ourselves.

"The Control-O-Mat is made in four different lengths: 8 in. with loading of 25 or 50 watts; 10 in. with loading of 75 or 100 watts; 12 in. with loading of 150 watts; and 15 in. with loading of 200 watts.

"I notice your particular mention of the neon indicator lamp (see my review of the Uno combined unit in the July issue). In our Control-O-Mat model the indicator lamp does light up when the thermostat switches *on* and thus indicates that current is flowing to the element, but if the element is broken it will still light up. It is not easy to overcome this effect without more sophisticated circuitry. I will gladly write to you if you are interested in the technicalities."

The Control-O-Mat can be placed in any position in the aquarium, but for best results it should be placed upright or at a slight angle with the thermostat always higher than the heating element. It is supplied with a clear, "soft" plastic suction holder for mounting. This should be positioned well clear of the lower (heater) end of the tube, preferably just below the neon indicator. (I was interested to note that the instructions supplied with this unit state that the glass tube may be dipped in soapy water to facilitate the sliding of the "sucker" on to the tube; and that the soapy water should be washed off afterwards; as in a recent review of another make of combined heater/stat I mentioned the fact that I found it easier to slip the "sucker" into position if the tube were made wet first. It's useful to find this simple tip supplied with the unit.) Naturally, no part of the Control-O-Mat tube should be buried in the gravel. The top of the unit is fitted with a fairly large green p.v.c. cap together with a stainless steel clip; this combination makes the unit suitable for marine or freshwater aquaria. A very useful length of approximately 3 ft. 8 in. of green flex, well sealed into the cap of the unit, is fitted. This lead is insulated with silicone "non-perish" sheathing. The magnetic snap action of the thermostat ensures maximum life from the precious metal contacts and freedom from radio and TV interference. The heater element is 80/20 nickel chrome and the tube is of heat-resistant glass. The p.v.c. cap of this unit is calibrated from under 18° to over 30°C. Situated in the centre of the cap is a red plastic dial with two finger "grips" and a pointer arrow. It takes only a matter of a second or so to set the unit to the required temperature, and the 24°C centre of the scale corresponds to the usual 75°F that most of us approximately require.

The unit is sturdily constructed and its features of being able to be totally submersed and so easily adjusted make it a very attractive unit which can be concealed quite easily in a planted aquarium. Under test I found the Control-O-Mat to give accurate and reliable temperature control—and this, allied with its many other attractive features, make it a unit that I would thoroughly recommend to either freshwater or marine aquarists—particularly those who might require to adjust temperatures with the very minimum of bother.

The fact that the neon indicator lamp will still light up even if the heater element is broken is a little disturbing—although I must point out that this is not unique to the Control-O-Mat but is common in many (possibly all?) makes of such units. This point was also made to me by the managing director of another large manufacturer of aquarium heating units. He also made the point that most aquarists want neon indicators on their units—even if some of such aquarists couldn't always remember whether the heater was off or on when the neon was lit; and even if the neon would remain lit when the heater element had broken or burned out. I would be pleased to hear more about such technicalities from Mr. S. A. Singleton. I would

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MADE IN JAPAN

-NISHIKI KOI

by Witold Zaczeniuk

YES—this is really produce of Japan, a country famous for its imaginative approach to life, for its taste for simple things, and for its creative ability, not only in the technical field, but also in reproducing nature with all its perfect beauty in miniature form. This unique interest of the Japanese in nature is already expressed in many ways, indeed a good example of this is, of course, the splendid Bon-Sai Trees. In the last decade we have witnessed on many continents, and also in this country, a growing popularity for "man made" fish—Nishikigoi, so aptly nicknamed "live jewels."

Cyprinus carpio L., commonly known all over the world as Carp, in Japanese "Goi," and to us enthusiasts as "Koi," most probably originated in Persia more than 2,000 years ago. Carp found their way to Japan through China and Korea, and to Central and Eastern Europe through the Roman Empire. Originally, wild Carp lived in large slow-running rivers, but with the advancement of civilisation, when man realised that indiscriminate hunting and fishing lead to an eventual shortage of food, carp farming became an alternative necessity. The first pioneers of carp farming were the monks in the monasteries, whose main object was to provide for themselves and others, animal protein during fasting periods, and for Fridays, when eating meat was forbidden. The choice of carp rather than other types of fish was made for several important reasons. Firstly, the carp is very adaptable to a wide range of climatic conditions, and secondly, its fantastic rate of growth and simple undemanding feeding habits make farming an economic possibility. Thirdly, carp is a very strong fish, and can be transported for long distances alive. It can live up to five hours without water, just covered with hessian. At the moment carp farming in Europe is a very important and well advanced branch of agriculture. A lot of money is being spent nowadays on research in order to improve the quality of the fish and also farming methods, so that one can get more fish per acre from the pond. Just last year I was told that a new breed of carp has been

produced, apparently having considerably less bones! What next—no guts?

My interest, however, lies in carp as a pet, and in its ornamental value as a fish for a garden pond, and therefore I am looking to the Far East, to Japan, to the Echigo District of Niigata Prefectur and Ojiya City, and the centre of Nishikigoi (or Nishiki-koi), that is to fancy carp breeding.

The Koi as we see it today, has been developed by skilful hybridising by breeders only in the last 120 years, when pond breeding became a necessity, and also for Japanese farmers of the Niigata Prefectur, a pastime during the severe snowbound winter months.

However, a real breakthrough in producing a better quality of Nishiki Koi came only after 1904, when a German Carp, having large scales (Mirror Carp) or no scales at all (Leather Carp) was brought to Japan and used for cross-breeding with existing small scaled Japanese Carp. A completely new type of Nishiki Koi was produced, called Doitsu, which, in strict translation, means "German," but to Koi enthusiasts, a Carp with large scales or completely scaleless. The first twenty-two varieties of the colourful Nishiki Koi were shown to the people of Japan during the Tokyo Exhibition in 1914, just sixty years ago. At present, I believe, there are more than sixty recorded varieties of fancy carp.

Genealogically, all Koi derive from just two varieties of native Japanese Carp, i.e., Red Higoi, and Black Magoi. The beautiful coloration of Nishiki is due to four main chromatophore pigment cells, Elisophores—red, Guanophores—white, Melanophores—black, and Xanthophores—yellow. The intensity of the body colours, shape, bright pigmentation of pattern and its location, are some of the considerations in determining the quality of the fish in a given variety. If the colour should be white, then the white should be snowy white, if red, very intense and rich, and if black, really nice and crispy jet black. In Japan, the shape of the Koi's body, and its swimming attitude is actually the most important consideration in assessing the quality of the fish. Here in this country our approach is somewhat different, perhaps because we are only beginners and have not as yet had a chance to establish our own position. To me at the moment, exactness of pattern and the coloration of the fish, are the most important factors in making my own choice.

The oldest varieties of Koi are represented by the names like: Asagi, Utsuri, Bekko, Taisho-Sanshoku, Showa-Sanshoku and Kohaku. Kohaku is the largest in numbers, and the most popular variety of all Koi. This fish is basically white, and has a red pattern on its body. Tancho Kohaku is also white with a red regularly shaped patch on its head, and Kuchibeni Kohaku is completely white, having only a small spot of red on the top of the mouth, resembling lipstick. Both of them are very closely related to the main group of Kohaku, and are both very elegant fish and in great demand. Plain coloured Koi, i.e., without any pattern like Higoi, Beni-Goi, Aka-Muji and Shiro-Muji are usually at the bottom of the scale for preference. Exceptions, on the other hand, are the plain colour varieties like Ohgon—gold, Yamabuki Ohgon—deep yellow, and white platinum Ohgon, which are sometimes very expensive and most attractive fish. I think they should be in one's pond. They will always attract attention, and you will see them even if the water in your pond is not as you would like it.

My own first choice when purchasing fish was Shusui, a blue doitsu fish with nice orange belly and fins. Still more elegant is Hi-Shusui, having deep red coloration instead of orange. There are a few more varieties very closely related to Shusui, like Shansoku Shusui, Ginsui, and Kinsui, which are my favourites. The second choice is Sankes, i.e., Taisho-Sanshoku and Showa-Sanshoku, tricolour fish, white, red and black.

Actually I do like all Kois, providing they are of good quality. The choice of colours is, no doubt, a very personal matter, but the choice of quality, even for beginners, should always be a principal aim. I never regret the time spent on long distance travels to many Koi dealers when purchasing my fish. Nearly all my fourteen adult Koi are of reasonably good quality. The standard of my own youngsters from last year's spawning, and now fourteen months old, is exceptionally good, and this is the best proof of the point I am making. Actually there is indication that about thirty of the young Koi might be rated much higher than the parents themselves. The photograph of at least one of the young Shusui could be easily published in one of the Japanese colourful books.

There is in this country amongst Koi keepers, a divided opinion as to whether breeding of Koi should be encouraged. The main argument against this is, I think, based on the assumption that in Japan breeding is done only and exclusively by professional and business people, i.e., Koi farmers, and also that nobody else can produce good quality fish. I do not know how true this statement is, but for a start, I just cannot believe that every Koi keeper in Japan just throws eggs out of the pond as soon as his pricey fish spawns. Of course, not all Koi enthusiasts in Japan, as indeed in this country, can have large enough ponds and proper facilities for spawning and rearing youngsters. Perhaps not all of them wish to spawn. In Japan Koi are very popular, and in great demand, therefore there is also fast expanding commercial breeding. Similarly many varieties of many types of aquarium fish are bred commercially. It is true to say that the main source of Koi for garden ponds in Japan, and also in this country, will come from large breeding farms. However, I believe what is good for Japanese Koi keepers should not necessarily be good for us in Great Britain. I do think the Japanese produce champions, and high

quality fish—the type we see in colourful Japanese books—first of all for themselves, and if we want to look to the future, and have progress with our Koi keeping in this country, then it is time to have a change of heart, and to breed ourselves, even with or without any knowledge of genetics.

I do hope that our Koi dealers, who have done so much to popularise Koi in this country, eventually will also be able to supply us with a British bred Nishiki Koi from our own breeders. However, for the time being, to our more ambitious Koi keepers who already have good quality stock, it should be an ultimate aim to spawn their own fish because, as I pointed out, from my own experience, there are many rewarding benefits from this.

Firstly, one has a chance to improve the quality of his existing stock. It is known that some very small proportion of offspring could carry better characteristics of grandparents, or even great-grandparents.

Secondly, crossing between some varieties there is a possibility of obtaining additional and very attractive new named varieties. The scope of cross-breeding is very large indeed. The following are only a few examples when crossing Shusui with Sankes, Ohgons, Platinum and Yamabuki Ohgons:

Koshi No Hisoku and Etsu No Hisoku—a green carp, is a cross between a Shusui and Yamabuki Ohgon.

Kujaku Ohgon—cross between Shusui and Hariwaki Ohgon.

Ginsui—very nice silver Shusui without red coloration is a cross between Shusui and Platinum Ohgon.

Kujaku Ohgon—a five-colour Koi—cross of Shusui and Ohgon.

Sanshoku Shusui and Bunka Sanshoku—a twofold characteristic of Taisho Sanshoku and Shusui.

No doubt one can see that there is a great temptation and also a challenge in breeding his own fish. To the majority of us Koi enthusiasts Koi keeping will never be a profit-making enterprise, but a very rewarding pastime and most pleasant relaxation after a hard day's work.

In this year's July issue of *The Aquarist*, I gave readers my first observations on rearing young Koi from the time they hatched up to eight months of age.

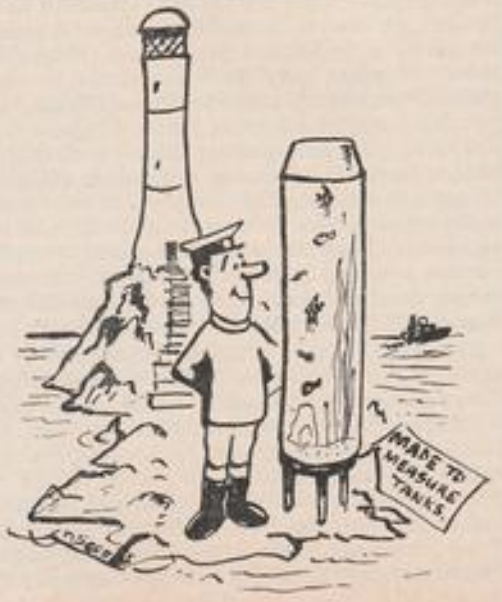
In the middle of March, when the water in my new pond, after several changes, had shown no presence of lime, and when it reached the same temperature as that of my breeding tanks, I began gradual transfer of my offsprings into their new quarters. During the first three weeks, I had only six Koi in the pond, they have actually been used as a pilot test on the conditions of the water. Twice daily I carried out a check on their behaviour and health in order to ascertain that the pond is absolutely safe for a major invasion of youngsters. Results have been most encouraging, so during the first week of April the long-awaited release of some 280 Koi was made. Before releasing, all the Koi were checked for their condition, and then, just for the records, photographed, some in groups, and some of them individually.

For the first two days I was only able to observe from time to time the occasional sudden darting of a single Koi from one end of the pond to the other. Then they began darting in groups of ten or twenty, and eventually it started a long expected wandering in large shoals round the pond, for the purpose of exploration of their new home, and then in a search for food.

As the days went by, the youngsters became more and more happy and contented with their new environment, and soon they started showing their appreciation to me by coming to the surface.

Now they are my pets. All of them are already tame, and are not afraid to take food from my fingers. They are like little dogs, they follow me round the pond, and always beg for more and more food. They are healthy, touch wood (I have not lost a single one so far) and they are fast growing. When they were one year old, six of them were 7 in.-8 in. long, but most of them are over 5 in. in length. Some colour changes are still taking place, and actually I know now that my grading into different varieties which I gave to readers when they were eight months old, was only approximated.

My spawners, and other adult Koi, I think, feel a bit neglected because I am spending most of my time by the new pond. Nevertheless, they, too, are doing fine.



Junior Aquarist

YOUR FIRST MARINE AQUARIUM

by Douglas Rose (aged 18 years)

IF YOU have been thinking about keeping Marines but feel rather unsure as to how to go about the task of setting up your first Marine tank, I hope by the end of reading this article you will be able to proceed with confidence.

Let me say one very important thing: "Marines are as easy as you make them." In other words, if you set out by saying to yourself, "I won't succeed," you probably won't.

Marine fish are "fish," just like freshwater tropicals —they require salt—and that's their main difference. The better the salt—the healthier the fish. There are exceptions, but even exceptions may not work in "your" tank. If you make some effort to look after your Marine tank, there is no reason why it should not be a complete success.

What's the secret? Well, I won't say "there's no secret," because there are a few! However, I will reveal all at a later stage. So, I have said that Marines are as easy as you make them. Remember this throughout this article.

Saltfish are, without doubt, far more stunning than most freshwater fish. This cannot be denied even by the most ardent freshwater aquarist. (By the way, I keep two freshwater tanks!)

I hope that I have given you some confidence to start off with. Now, onto the formula for certain success.

Choose a good tank which is rust proof; the larger the better. As a beginner, don't keep Marines in a tank of less than ten gallon capacity. A tank of around twenty-five gallons is fine—a tank of fifty gallons capacity is even better. Take this advice or you could end up a very disappointed person. Marines don't like small tanks, unlike many freshwater tropicals. Marines need space and far more oxygen; so don't deny them an adequate home. Anyway, a larger tank means several things:

(1) Less chance of failure;
(2) A happier collection of fish;
(3) Room for expansion in the tank.

I would suggest starting with a tank of about 27½ in. × 12 in. × 15 in., or 36 in. × 15 in. × 15 in., if a larger tank is not practical. The above sizes are fine for many smaller marines and/or invertebrates and would make an excellent exhibit. I saw a splendid 27½ in. × 12 in. × 15 in. marine tank at a shop in Guildford. In it were living rocks, plants, shrimps, anemones, fish, etc., all living in perfect harmony. It looked like a small section of a reef had been encased within four glass walls. I use an all-glass tank and have had no trouble with it whatsoever. A wooden hood and cover glasses are most important. The former will not rust and the latter will prevent excess evaporation.

Once you have decided upon the type of tank and its size, the next most important thing to choose is a filter for your tank. I have my preferences and, no doubt, if you have kept freshwater fish, you will have yours. On the subject of filters, you will have to make your own personal choice between the three main types of filter set-ups but, whatever the type selected, use a good filter made by a reputable company. I don't recommend inside filter-boxes as these are too weak

for a marine tank. Here are three filter set-ups:

(1) An undergravel filter;
(2) A power filter;
(3) An undergravel filter combined with a power filter.

An undergravel filter is fine by itself, but if you can treat yourself to a good power filter you will be that much safer. Use a power filter by itself or even better with U.G. filtration. A power filter helps to keep the marine water clearer by not only removing the suspended dirt, but also by cleansing the water by means of activated carbon. I have seen beautiful tanks kept using any of the above methods of filtration. Make up your own mind on which of the above systems you would like to use—each dealer will have his own favourite.

Heater and thermostat are again personal choice. I prefer using a separate thermostat.

Choose a powerful and reliable air pump. Strong aeration/filtration is vital (aeration must be on 24 hours per day). A battery pump kept as an emergency is a very useful item with marines. They should not be deprived of aeration for long.

The salt you use is very important. Choose a well-known make—most branded salts are fine. Personally I like "New Tropic Marin," but there are many other good brands available. Don't buy a cheap non-branded salt—it isn't worth it.

Lighting is also very important, especially for invertebrate tanks. I can give you a few small tips. Put in a fluorescent tube rather than bulbs. There are many types on the market. A good combination would be in a warm white or daylight fluorescent tube (Kolor-rite) plus an incandescent striplight. I use two Kolor-rite fluorescent tubes and have found them excellent for my type of set-up (fish, plants and invertebrates). Keep lighting on for around eight-ten hours (per day).

Sand comes in various grades and types. I suggest a layer of Oolite on the floor of the aquarium. A thick layer is required for U.G. filtration.

Extras such as hydrometers (to measure water density), thermometers, must be bought and checks should be made regularly.

One final tip before I give you an idea about how to set up your tank. If your pocket permits, purchase an ozoniser. It is a very useful cleansing apparatus and I have found it an invaluable aid to my marine tank. Many of my aquarist friends agree with me. Although it is an accessory which you could do without, it is of great benefit to the health of your tank. If you have a death in the aquarium, an ozoniser will reduce any bad effects and will even help save *all* the inhabitants of the tank.

There are two main ways of setting up your tank. You can use thoroughly cleaned coral and rocks with a few added shells for a beautiful set-up—or you can use rocks and "living" rocks for your marine tank. The latter set-up is more natural and creates a very healthy aquarium, while the former set-up, although not quite so natural, is cheaper. I will take the "dead" coral set-up first.

When purchasing coral (only from a marine specialist) make sure you throughly cleanse it. Pour one cupful of household bleach into a bucket of water containing the corals and let this stand for at least a day, and then rinse the coral thoroughly under a running tap for one hour and place it/them in boiling water for several hours. Then allow it/them to dry and finally rinse the coral once more for at least one hour. The coral should now be completely safe for use. If it still smells, repeat the process. Remember, traces of bleach can and will kill your fish if you are impatient with the washing of your coral.

Now your coral is ready, you can wash your "gravel." Again this must be done thoroughly. Once your gravel is thoroughly washed you can put in your undergravel filters (if you decide to use this method). On top of this place the gravel. A thick layer is required. Now you can position your corals and shells. It is a good idea to pile similar corals together to create miniature caves for your seafish. It is fascinating to watch marines dart in and out of these artificial caves. Besides, these caves create an excellent "dark corner" and refuge spot! Next put in your salt water as directed on the packets of salt. Don't use natural sea water or you'll be asking for trouble. The hydrometer reading of the water in your tank should be 1·022/1·024 at a temperature of 75/77 F. Your tank is now ready for its maturing period. There are two ways of maturing this type of set-up:

METHOD 1: This method is good but you will have to have patience! For every twenty gallons of salt water add a pea and a similar sized piece of shrimp. The pea and shrimp will soon start to decompose and this will set off the Nitrogen Cycle, i.e. your tank bed will be the home of countless bacteria. You will have to buy a Nitrite test kit. The nitrites at first may be negligible, but after a few days nitrites will be very evident from the results of your reading from the test kit. Keep on taking tests every few days until NO nitrites are present. After the readings have remained negative for a week or so you can purchase your fish (see the end of article for best beginner's fish). Buy your fish over a period of time, not all at once, or you will have a nitrite problem. This method takes about five weeks.

METHOD 2: If you cannot overcome your impatience, you can mature your tank in a different way—but the following method has a major drawback. You can proceed straight away with some hardy marines with high nitrite tolerance levels. Damsel fish are ideal for this purpose. Two or three damsels are sufficient for a twenty gallon tank. Don't get more than one type of

damsel fish, however, as they are terrible bullies. Choose very small fish. Now onto the drawback. Fish introduced in this way are *liable* to catch "*Oodinium*" (marine Velvet disease). Although there are numerous cures for this, these cures will affect invertebrates to a great extent and can be lethal. So, if you want just fish, you can use Method 2; however, if you would like to try your hand at keeping invertebrates, Method 1 must be used. Remember . . . if your fish get *Oodinium* and invertebrates are in the tank, you will have to move either your fish or your invertebrates. But *Oodinium* is not a disease that your marines will contract if you follow these rules and also buy healthy fish. Throughout Method 2 you should be using your Nitrite kit to test your salt water. When no nitrites are present you can purchase a "Show" fish, but get your local marine dealer's advice on this matter as there are lots of fish to choose from.

The other way of setting up your marine tank is the way I used (as a beginner). It involves not only a different approach, but also a different method of maturing your tank. This method is for those readers who would like to set up a "natural" invetebrate tank (i.e. not using any dead corals or shells).

After you have set up your tank and decided about your method of filtration, all you will have in your tank will be a layer of gravel and salt water. Allow your salt water *at least* one week to mature. After this settling down period and having checked that the density of your water is satisfactory, you can then purchase some living rock. The living rock contains organisms which will in turn start your tank maturing. Living rock looks very pleasant but, unfortunately, due to its weight, is very expensive, so you will have to work out how much you can afford. Obviously, the more the better. Allow another week before you purchase some other invertebrates and then, after around one month, your tank will be ready for a few fish.

The final paragraphs are devoted to a list of fish excellent for beginners and which I can thoroughly recommend. Also recommended invertebrates. I shall include a food chart.

There are many marine fish to choose from, but only a few are suitable for immediate beginners.

The following fish are very good "starters" as they are pretty and hardy:

(1) Anemone fish (Clownfish);
(2) Cardinal fish (family Apogonidae);
(3) Cleaner Wrasse (*Labroides dimidiatus*);
(4) Dragonfish (family Scorpaenidae);
(5) Damsel fishes (keep one only of each species):
  (*a*) Green Forktail Damselfish;
  (*b*) Sergeant Major;
  (*c*) Black Velvet Damselfish;
  (*d*) Saffron-blue Damselfish;
  (*e*) Electric-blue Damselfish.

For an invertebrates tank you also have a very wide range of inhabitants. For the beginner I would suggest the following:

(1) Small anemones;
(2) Tubeworms;
(3) One cucumber;
(4) *One* banded coral shrimp;
(5) A rock with serpulids;
(6) A hardy live coral (i.e. *Goniopora*).

If you buy invertebrates, just because they "look nice," you'll probably fail. The above invertebrates are the easiest to keep and a reputable dealer will no doubt agree.

If you keep anemones, buy a couple of clowns or *vice versa*.

Feeding marine fish is easy and good fun especially when the fish learn what time you will be feeding them. Nowadays all sorts of frozen foods can be purchased for marines besides live (costal) shrimps and brine shrimp eggs. You have a massive choice of foods and no longer do you have to give marines a sole diet of flake food. Check with your dealer to see what he has been feeding his fish.

The following chart is a rough guide as to how to feed fish like clowns and damsels. Remember, "do not overfeed." Feed a little at a time and you will soon get to know how much your fish require. I feed my fish *once* a day. Feeding twice a day may be preferable, but my fish (five) have lived happily for the past eighteen months and continue to do so. So I doubt if I will change my feeding plans.

Monday	Frozen Shrimp	+1 drop of Vitamins/10 Gallons
Tuesday	Frozen Brine Shrimp	+1 drop of Vitamins/10 Gallons
Wednesday	Frozen Scallop	+1 drop of Vitamins/10 Gallons
Thursday	Live Brine Shrimp + Flake Food	+1 drop of Vitamins/10 Gallons
Friday	White Worms and Mysis Shrimp (frozen)	+1 drop of Vitamins +1 drop of trace elements per 10 Gallons
Saturday	Scraped Oxheart and Live Shrimps	+1 drop of Vitamins/10 Gallons
Sunday	Frozen Clam	+1 drop of Vitamins/10 Gallons

Feeding an invertebrate tank is not difficult. Live corals require plenty of light. Anemones require feeding once or twice a week with a whole shrimp (live if possible). Tube worms can be fed Liquifry and baby brine shrimp as can Sea Cucumbers. A banded coral shrimp can be fed with most types of frozen food. In fact, the juice of most frozen marine foods sold by dealers is excellent fare for small invertebrates especially if *particles* of food can fall all over the tank.

THE WATER HYACINTH

by Jack Hems

I HAVE READ somewhere, that the Canadian water weed (*Elodea canadensis*), quickly after its introduction into this country during the first half of the nineteenth century by Professor Babington, made boating, swimming and fishing impossible in the River Cam (where some stems of the plant had been thrown by the Curator of the Botanic Gardens at Cambridge), obstructed the drainage system of a large area of East Anglia by invading and blocking ditches and canals, and led to government action being taken to limit its growth. However, whatever steps were taken to keep it in check seemingly the plant suffered no set-back until, for reasons never well explained, it exhausted a great deal of its powers of vegetative reproduction and thenceforward kept within reasonable bounds, though it appeared in course of time in waterways all over the country. Which brings to mind yet another plant nuisance: the floating water hyacinth (*Eichhornia crassipes*).

E. crassipes, of the family *Pontederiaceae* and the only member of its genus which floats, is native to Brazil. Yet over the years it has turned up more and more in many parts of the tropical and sub-tropical world, where it has been carried by accident or design. In these places it has spread and, according to reports in the lay and scientific press, is still spreading, like a plague. There is evidence enough that huge sums of money have been expended in the U.S.A. (in Florida, for example) to keep rivers open for traffic. More recently, the plant has become an increasing problem in Africa. It was first recorded in Southern Rhodesia in 1937. If we leap forward in time we find it causing trouble in the Rivers Congo and Nile, that is from the 1950s onwards.

The rate of the plant's increase (by means of side shoots or stolons) is alarmingly rapid. We are told that a single water hyacinth can result in about a thousand more within the space of six months. Unfortunately, controlling the spread of the water hyacinth by up-to-date methods, that is by destructive chemical sprays, raises serious problems. Perhaps the most important is the fact that when large areas of the plant die down the water becomes so badly polluted that all higher life beneath the surface is wiped out. Furthermore, herbicides are no permanent check to the plant's growth, for the numerous seeds it produces can remain viable for months.

That the water hyacinth appears not to inconvenience river communities and commerce in Brazil has not been made clear, but certain factors there are known to be inimical to its progress. For instance, it is worth noting that the highly acidic conditions which occur in the rivers at certain times of the year act as a brake on its growth. Again it is probably well-cropped by indigenous river fauna.

In temperate countries the water hyacinth is beloved by aquarists and pondkeepers. Its long, feathery roots, brownish to red, which hang down like pony tails, are ideally suited to catching the sticky eggs of spawning goldfish. Its extremely handsome foliage and pretty flowers add beauty to its surroundings. In shallow water the roots of *E. crassipes* sometimes become buried in the mud and keep the plant in one spot. In deep water, however, the plant floats free. The rounded leaves are about the size of a soup spoon. They grow in the form of an upright rosette. The swollen leaf-stalks or petioles are filled with a spongy tissue which resembles green-tinged foam. They serve to keep the plant as buoyant as a rubber ball. The flowers are raised some 6 in. above water level. They cluster round stout stalks. A delicate violet in colour, they bear a gold and blue peacock-eye marking in the upper petals. It is a great pity though that they do not stay in character more than about half a day. However, there is a succession of blooms.

To grow the water hyacinth in the aquarium it must be given a strong top light. Another essential is a warm and humid atmosphere. Keeping the water hyacinth alive over the winter is never easy, though some aquarists and pondkeepers manage it well. The recommended procedure is to pot the roots of a few plants tight in a compost of unwashed grit or non-fibrous loam, mixed with some horticultural charcoal, and place the container in a frost-free greenhouse or conservatory. Periodic spraying with tepid water is called for to keep the compost moist. If all goes well, the plants start up again the following spring. In a heated greenhouse or fish house, the plant will continue to grow all the year round provided the light is bright.

6D MONTHLY

The AMATEUR AQUARIST

A Magazine devoted to the Study of Aquatic Life.

AEH

No. 1, Vol. 1 May, 1924

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GOLDEN JUBILEE

1924-1974

- EDITORIAL -

A. E. Hodge, F.Z.S., Founder and Editor of "THE AMATEUR AQUARIST."

LIFE has changed in a wide variety of ways since this magazine first appeared in 1924 but many of those changes stem from causes which are easily overlooked. In Britain in those mid-twenties days it was possible to move from one county to another and to be conscious of differing ways of life, modes of speech and of custom. Communities were separated from one another by difficulties of transport and limited means of communication. Individuals following similar pursuits in different localities were without easy means of making contact with one another and it is difficult to appreciate now how individualistic life was without the instant mass communication of radio and television when newspapers formed the only means of broadcasting news and information. The "wireless" had just arrived but only very few homes were able to tune into "2LO" as the first broadcasting station was known.

People sharing a common interest could become aware of each other's activities only through the pages of a periodical specialising in their subject and in an endeavour to provide such an organ for those interested in aquatic life, A. E. Hodge launched the *Amateur Aquarist* in May of 1924. Odd balls conducting studies and experiments with fish in aquaria in the shed at the bottom of the garden were now able to exchange observations with their contemporaries and were put into touch with one another so that local societies were formed. With endless enthusiasm and great foresight, A. E. Hodge strove to bring aquarists together and in his first issue ran an editorial in which he proposed the formation of "Field Clubs".

The second issue carried a follow-up in the editorial and in the third issue Hodge was able to announce that two keen naturalists had consented to form local "Amateur Aquarist Field Clubs", one in North London and the other South of the Thames.

The August issue appeared under the new name of the *Amateur Aquarist and Reptilian Review* and in the Winter number the editorial proclaimed the news that as a quarterly magazine ". . . the *Amateur Aquarist* starts upon a new era as the organ of the British Aquarists' Association—an organisation which has long been needed". Elaborating his theme, Hodge continued: "Though the British Aquarium Society has been doing good work in London since its establishment in 1919, aquarists resident in distant towns cannot very well travel to the Metropolis to attend its monthly meetings, and they are, therefore, at a disadvantage. There is no reason why every large town in this country should not have a society of its own, as in America, and it is in an effort to bring this

about that the British Aquarists' Association has been established.

"A nucleus of a few ardent aquarists, starting as a branch of the Association, may, by attracting others soon develop into an affiliated society. The average aquarist is, I am afraid, too apt to keep his hobby to himself and thus, whilst debarring himself from the congenial companionship of others with kindred interests, he hinders the spread of aquarium-keeping amongst a public sadly ignorant of its methods. It will be seen from the notice below that one of the objects of the B.A.A. is 'to enlighten the general public as to the proper care and maintenance of an aquarium so as to avoid that suffering on the part of the inmates which is so often the result of ignorance'."

On September 24th to 27th, 1926, there was held the Home Aquarium Show, which was staged at the British Sea Anglers' Society Rooms, Fetter Lane, London. The Autumn issue carried a final exhortation to all readers to support the show by attending if they could not exhibit. "Nearly two hundred tanks and vivaria will be at the hall ready to accommodate specimens. . . . In order that readers who were diffident on this matter may yet come forward with exhibits, *the closing date for entries has been extended to the day of delivery, 23rd September*. . . .

"It would be well to remember that, being the first competitive show of the kind in this country, the Exhibition is on its trial and, for the sake of the Fancy, is therefore deserving of the support of every ardent aquarist. If a success, the Show will be an annual event and will undoubtedly grow in size and importance."

The Show was a success and despite a number of failings, was sufficiently encouraging to warrant a repeat performance in the following year and staged, on that occasion, at the Polytechnic Institute, Chelsea. Having learnt from mistakes made in the previous year, the organisers evinced great satisfaction at the close of the second Show and A. E. Hodge was moved to declare in a subsequent editorial that . . . "in size, at least, it equalled if not surpassed, some of the largest exhibitions of the kind held in America".

So the *Amateur Aquarist* went from strength although, while gaining support all the time, it faced many problems many of which still remained when its first editor and founder, A. E. Hodge, died in 1936. His place was taken by F. A. Watson with A. Fraser Brunner filling the post of advisory editor. Watson capably continued the enthusiastic work of the founder until the third year of the war when the editorial offices and publishing works were destroyed by enemy action. Such were the adverse conditions of those days that along with many popular publications, the *Aquarist & Pondkeeper*, as it had by then become, was suspended for the war's duration. In the following year F. A. Watson died from war injuries.

F. Austin Watson, F.Z.S.,
Editor from 1936-1941

In 1946 A. Fraser Brunner became editor with the reappearance of the *Aquarist*. In the face of numerous post-war shortages coupled with the loss of much material and equipment from war-damage, the magazine slowly regained strength and grew once more as the hobby, too, began to expand with the return of its devotees.

By 1948 the fishkeeping hobby was enjoying a new boom and although many wartime restrictions were still presenting a number of difficulties, *The Aquarist* was firmly re-established. In that year Fraser Brunner took up an overseas appointment and the editorial chair passed to Anthony Evans who occupied it until his resignation in 1966.

We are happy to still retain not only many of our original readers but also a number of our early contributors and advertisers, some of whom offer their recollections elsewhere of those early days of fishkeeping when enthusiasm was more abundant than the host of facilities which are now available to the serious aquarist but which were then so very few.

To all our old friends we say, glad you are with us and to the growing ranks of new ones, glad you have joined us.

The first page of this supplement shows a reproduction of the cover of the first issue.

FIFTY YEARS OF FISHKEEPING

BY OUR SENIOR CONTRIBUTORS AND OTHERS

WHAT IT DID TO ME

L. B. Katterns, F.N.A.S., F.R.H.S., F.Z.S.

WHEN ONE is in one's teens life ahead appears as a very long time filled with promise and hopes, each day having its part to play on the future be it good or bad and as the years pass by the future seems to diminish; this is no doubt due to the subconscious mind accepting the fact that we have one less day to live.

The years steadily progress and we begin to look back and wonder where they have all gone and we analyse the past to see where we went wrong or what it was that helped us at the time it happened and maybe we shall find that there was some particular item which did much to shape the whole of our future. In my own case I have no doubt whatsoever as to what shaped my life for the last fifty years and I do not regret what has happened (although there were times when it all appeared rather pointless). Of course I refer to the publication of "The Aquarist and Pond-keeper" and the following will explain just how a magazine has directly and indirectly affected my whole life.

I served in the Royal Sussex Regiment for two years during the 1914-1918 War at home and abroad and was demobilised in December 1919, returning to finish my training as a Dental Surgeon and at the same time I started to keep a few fish having been interested in this pastime since I was a young boy.

This was quite a difficult hobby to take up as the only source of fish, and what goes with them, was the odd pet shop. These in turn were few and far between and only a small percentage of those that did exist had much in the way of fish to offer, a few goldfish and perhaps an odd one or two native fish which had been hooked and affected with fungus were the best one could expect to find and the main source of goldfish for the home was from the rag-and-bone men who gave them in exchange for whatever they collected.

The sources of knowledge on the subject were very limited and the only periodical having articles was the

Bazaar, Exchange and Mart and although very poor material by present day standards, they could help at times and the only text book of any use was *Freshwater Aquaria* by Rev. Gregory C. Bateman, A.K.C., published in 1890. It is now long out of print. In my opinion this book is one of the best ever published, it may be laughable in some ways but one will have to look hard to find a book which gives so much information in 350 pages and some of the illustrations can hold their own with any modern book.

I used to get my needs mainly from a pet shop in Camden Town, north London and on a visit there in 1924 I saw the first issue of the *Aquarist and Pondkeeper* stuck on the front door. It was then called the *Amateur Aquarist* and consisted of very few pages and was printed on a pale green paper. It was this day and the purchase of the magazine that I see in hindsight that governed my future life to a very great extent. During the previous few years I had learned quite a fair amount but it had been done the hard way and the appearance of a magazine on the subject offered the opportunity of further knowledge and the possible contact with others with similar interests.

It was after some months and a number of letters that I first met the editor, Mr. A. E. Hodge, at his home in Southfields, south west London, and we had a long discussion on our problems, mine being mainly on the need to get in touch with others having some practical experience and willing to exchange their findings. Mr. Hodge had problems of a different nature, having started something he had been thinking about for some years he was worried concerning his ability to keep it going through the difficult period that must attend such a venture in its early days.

The main troubles appeared to be the need to get sufficient advertisements to cover the cost of production and contributors to supply articles, especially some on fish. Mr. Hodge was mainly interested in reptiles and he also had several friends with similar interests who were able to help in this field.

Mr. Hodge, being a very persuasive gentleman, pointed out that the contents of some of my letters to him would form the basis of articles which would be informative to other readers, and judging by the years that followed he was right.

Little did I realise what I had let myself in for. I started and did my best to pass on my very limited knowledge. This was more difficult than it may sound as I had never written a word before in my life that was to be printed and be available for anyone to read and I made up my mind that come what may I would never, under any circumstances, put anything in black or white that had not been personal experience or that of close friends where I had been able to verify all the facts, and to the present day I have never diverged from this resolution. The need for people wishing to get together soon became obvious and Mr. Hodge was successful in finding a few people in the London area who would be willing to meet others at their homes to discuss matters relating to their hobby and dates were published when this would be convenient. I attended one of these meetings at Winkfield Road, Wood Green, north London. and we had only a few meetings before I was asked to give a talk. This was a further point in the future course of my life and within a further five or six years I found myself out several times a week on the same job and by 1950 I was rarely at home and my practice began to suffer. Ten years of such conditions coupled with the business activities in the aquatic world which had grown in a similar way made me decide to sever all club activities and I may say that in making this decision I felt that I had done more than my share to foster the hobby which in my mind was the best of all hobbies. Among the few advertisers in the early days was a firm offering live coldwater fish. It was L. Cura and Sons and at the time they were located at Bath Court, just off Rosebury Avenue. Today they have a large fish farm of over five acres at Hemel Hempstead and are wholesale only.

I used to visit their premises, sometimes accompanied by other aquarists, to purchase fish once a fortnight and I think that I saw more varieties for the first time than anywhere else I visited during the early period of my aquatic activities. Previous to this we relied on trips out into the country to collect our fish. It was at the same premises that I first saw tropical fish and they consisted of two small tanks, one containing Zebras (*Brachydanio rerio*) and the other Guppy (*Poecilia reticulatus*).

The possibility of keeping tropicals appealed to me immensely and on the advice of Mr. Hodge I contacted Mr. Arthur Derham of Watford as being able to help me in this direction. Mr. Derham turned out to be a man of drive and vast experience and also a man with a great sense of humour (some of his early advertisements in *The Aquarist* prove this).

We became great friends and I was able with his help to make contacts in Germany enabling me to get varieties of fish which were not available in this country. It was a great pity that I had not had this knowledge while I was serving in the Rhine Army.

Mr. Derham and myself combined resources to import fish from Germany which in those days had to be done by boat. They took two days in coming and losses were about 75% making the fish more costly than they are today. However, we did get enough to enable us to build up stocks as one of us usually managed to breed from the varieties we acquired.

Overleaf:
From the B.A.A. Exhibition Programme, 1928.

ARTISTIC AQUARIA

MOUNTED AQUARIA

With painted angle iron frames and wooden bases. Vertical patterns from 4in. square x 7in. high and rectangular patterns from 6in.x4in.x5in. high.

UNMOUNTED AQUARIA, i.e., without wooden bases, from 12in. upwards, painted angle iron frames. The glass is easily replaced should it ever get broken.

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Cast iron frames giving the same rustic effect. Sizes: 4½in. x 2½in., 6in. x 3½in. and 7in. x 4in.

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Frames as described for Rustic Aquaria, and roof forming a capacious reservoir for the fountain, of which the jet can be regulated so that it will operate for a long time without re-filling. Rockwork and automatic overflow and tap included. Sizes 15in. ext. dia. x 31½in. total height and larger.

THE ARTISTIC AQUARIA CO.

Partners: I. H. Boughton & D. N. Turnbull

113, DRAKEFIELD ROAD, LONDON, S.W.17

We both had considerable correspondence, mainly from readers of *The Aquarist*, wishing to obtain stocks of fish and before we realised what was happening we were virtually in business as professional aquarists and from this importers, breeders, wholesalers, and retailers all at the same time, a state of affairs which is now recognised as impossible and one which lost us both a fair amount of cash. We decided to separate these four sections and the first step was for me to open a retail shop in Highgate Road, N.W.5 and to the best of my knowledge it was the first of its kind in this country although it was soon followed by Wigmore Fisheries in Marylebone, run by Mr. Charles Schiller who is now known as the manufacturer of Little Wizard Products.

All through this time Mr. Hodge was asking people all over the country to get together and where a number could be got together he could arrange for someone to give them a talk to start off a club, myself being the someone, and as he was fairly successful in his efforts I had to make numerous journeys all over the place but the exercise did mean the starting of over fifty of these clubs. I think it was worth the time and effort.

The second World War wiped out most of these and the only one to carry on without the loss of a single meeting was the North London Aquarists. They changed their meetings to Sunday mornings owing to the black-out and had the doubtful honour of having a "Doodle Bug" attend one of the meetings. There were no casualties and not a fish was lost although all the tanks were filled with rubble and there was a terrible mess.

Mr. Derham and myself were the first to try shipping fish into this country by air, and we lost a great deal of money in the early days. The present air lines were non-existent and The Imperial Airways and the German Luft Hansa Co. handled most freight. Plastic bags filled with oxygen were also not in use, the fish being sent in large cans well packed to hold the heat and only about 25% of the fish could be sent in the same quantity of water as today making the carriage very costly but the main trouble was the fact that all freight space was unheated with the result that the fish were frozen en route. While writing these notes so many things which have happened in the past come to my mind and I think I could fill a book with these and although *The Aquarist* is now quite a large magazine, it does not entitle me to unlimited space so I shall content myself with just a few of the main changes which have come over the hobby since the last War.

The hobby has become more organised both in the amateur and trade sections, the latter having its own powerful association which has done a great deal to raise the standard of its members. In conjunction with the Veterinary Profession, courses are arranged and examinations held periodically when successful candidates are granted diplomas and in my own opinion it is only a matter of time before it will become necessary for anyone wishing to enter the livestock business to furnish proof of their knowledge and ability in order to obtain the licence now necessary to do this. The Pet Trade is also served by two monthly journals.

Since the end of the last War there has been a flood of literature dealing with fish-keeping and the numbers of books now available to the aquarist must run into several hundred. The majority of these are of U.S.A. origin and prices range from a matter of coppers to many pounds and the price would appear to have little relation to the value of the book to the average aquarist as some in the lower range offer far more practical information than some highly priced. However, a reliable book is an investment and the knowledge gained from it will save pounds in the long run. It can be quite a good idea to get several books from the public library before making a choice on which to buy and keep for reference.

The amateur side of the hobby has changed over the years. There are now several hundred clubs, each with its own character and ambitions. A club can be mainly a social gathering where fish-keeping is discussed and knowledge passed on to each other or it can be more of a competitive nature where the main interest is the showing of fish. This is an excellent scheme, but it does have its limitations and perhaps the most important is the fact that friction can be caused and the number of clubs which split up can often be traced to this cause. Then again, the idea that the fish show gets more people into the hobby is correct only to a degree. There is nothing so boring to the newcomer as looking at rows of bare tanks with similar fish in them. It is the set-up tanks which draw attention and I think that a non-competitive exhibition does far more good and produces better results.

In addition to all the clubs there are several federations catering for groups of clubs so the amateur side of the hobby can be said to be very well organised. In fact, there are some who think it is over organised.

There have been reliable estimates from various sources that less than 2% of the aquarists in this country have any club contact at all. The growth in the number and size of firms catering for the needs of aquarists is in itself a guide to the magnitude of present day fish-keeping and I feel sure that *The Aquarist* is the major factor in bringing about the state of affairs.

During my association with the hobby, other publications have come and gone and no doubt history will repeat itself in the future, but I very much doubt if this journals will be surpassed or even equalled. Finally, in wishing *The Aquarist* many happy returns, I should also like to thank the Editor and all concerned with its publication for the service and help they have given to the hobby we all love so much.

EARLY DAYS OF AQUARIUM KEEPING REMEMBERED BY

Jack Hems

Jack Hems, who celebrated his 63rd birthday earlier this year, began to keep fish seriously at the age of nine when he lived in Bedford Park, London, W.4. His introduction to the keeping of tropicals was around 1932. He has lost count of the articles on aquarium fishes he has contributed to English and American journals over the last 40 years. Before the war he was Query (Aquaria) Expert to *Exchange & Mart*. His first article in the *Aquarist & Pondkeeper* appeared in the September/October issue of 1934. He has answered more than 8,500 readers' Tropical Queries to date. Author and co-author (with G. F. Hervey) of ten books on fishkeeping, Jack writes from experience and has kept several hundred species of tropicals over the years and has bred a few score, too.

IT TAKES more than a blitz and the property developers to erase from the memory some of the aquarium shops which were well known in London about the time when Rudolph Valentino held the female heart enthralled, Max Miller played to packed music-halls up and down the country, and horse-drawn vehicles and barrel-organs could still be seen and heard on the streets of Mayfair.

Perhaps the most fascinating aquarium shop in those less-troublesome days was the one situated half-way up the Pentonville Road. "B. T. Child, The World's Best Aquarium Maker". So ran its owner's advertisements in early issues of this magazine. Later, this piece of succinct information was altered to "B. T. Child, The Compleat Aquarist".

Ben Child, as he was always known to his customers and the frequenters of the pub across the road, was indeed The Compleat Aquarist. For 113 Pentonville Road was a veritable Aladdin's Cave of aquarium

requisites and fishes. Furthermore, it was not uncommon to find Japanese Waltzing Mice and bird-eating spiders sharing the wooden counter with a stuffed tabby cat and a number of containers housing, say, yellow paludina snails, frog tadpoles and water spiders. Tins of maggots and other *ephemera* rustled or buzzed among dusty invoices, price lists, discarded pipe-cleaners and ledgers. As added attraction, Ben Child always maintained an excellent stock of reptiles and amphibians.

Behind the shop a steamy room contained serried rows of iron-bottomed tanks base-heated by tiny gas jets. A few of the tanks housed a goodly variety of livebearers, some of which are seldom, if ever, seen today. In other tanks cichlids, big and small, cyprinids from the U.S.A. and Asia, anabantids and a fair sprinkling of oddities such as *Synbranchus* eels, butterfly fish and electric catfish backed away from too close an inspection of their transparent prisons.

Towards the close of the 1920s, my schoolboy addiction to goldfish and sundry coldwater fishes had given way to a passion for aqua-vivaria. Hence one darkening autumn evening, after a day's work as a junior in a publisher's office in Holborn, I made my way to Pentonville Road with the firm intention of adding to my collection of Japanese newts. Instead, I came away with a pair of paradise fish from China.

From that moment, I was hooked. I mean on tropical fish. My wonderfully coloured male fathered hundreds of progeny over the next four or five years and for these, like the fry of other easy species of warmwater fish which I bred in regular tanks or large glass jars (ex-battery cases), I received a few pennies each from interested dealers though, more often than not, I used them as currency to expand my collection. Thus five or six young rosy barbs were exchanged for a *Corydoras paleatus*, and so on.

From Mr. Philip Castang, a most likeable dealer in a variety of livestock on Haverstock Hill, I ordered a tank of unconventional construction. It was long, tall and narrow, with a base of sheet iron for oil-heating. I covered the iron with a mixture of sharp sand and cement over which, after it had set, I applied several coats of black bituminous paint. Then, following plenty of soakings and changes of water, I introduced some young angel fish. I was fortunate enough to have the two sexes present and before a year was out a pair bred. I succeeded in raising a few dozen fry.

In the late 1920s and early 1930s oil or gas was in common use for heating tropical tanks though submersible electric heaters had already made their appearance on the market. Mr. Leslie Katterns, a well-known aquarist-dealer of Kentish Town, used to advertise "Electric heaters with four different heats, and guaranteed". Some dealers even stocked German air and water pumps too. For all that, pumps to aerate the water were not in general use except among a small minority of ordinary aquarists or those enthusiastic beginners who could afford them. The balanced aquarium still reigned supreme.

Among the most inventive of aquarist-dealers was Charles Schiller, who installed tanks in Buckingham Palace, transatlantic liners and constructed and maintained the spectacular aquarium on the roof of Selfridge's famous store in Oxford Street. Understandably, this superb aquarium was dismantled before Hitler's Luftwaffe spread death and destruction over most of Europe.

The Schiller System of filtration was, I believe, the best then known, and the inspiration for many of the improvements in aquarium hygiene which came after the war.

Mr. Schiller's aquarium shop, situated in a narrow court off Wigmore Street, was one of my favourite ports of call. His craftsmen-built tanks were never anything but beautifully planted and spotless and he specialized in rare fishes from all parts of the world. If I remember right, Charles Schiller was the first dealer to offer the neon tetra for sale, though he may have been beaten to the post by Messrs. Pope and Robertson, in nearby Weymouth Street. The initial importation of neons into England caused quite a sensation and resulted in quite a few write-ups in the national press. They retailed at a high price, were sold out within the space of a week or so but by 1936 went for a mere £3 a pair. Marine fishes from the Red Sea and south-east Asia were often seen about this time. The saltwater necessary for their well-being was the genuine article and was commonly taken from various points off the south coast.

Previous to opening the shop in Weymouth Street, Mr. Pope was in charge of Gamage's aquarium department. Increasingly this great store offered for sale rare breeds of fancy goldfish, tropical freshwater fishes and tropical marines. I can still see in my mind's eye a massive tank housing several large *Selenotoca multifasciata*. For a decorative aquarium, these fish of the family *Scatophagidae* could hardly be bettered. Why do we not see them now?

There were two routes to Gamage's fish department. One was through a maze of lawn-mowers, garden forks, and the like, while the other meant hurrying along a narrow passage crammed on both sides with boxes of soap, myriad bottles of scent and jars of cosmetics.

Not unnaturally there was no shortage of dealers or part-time dealers who made extravagant claims in the aquarium press about the amazing variety of fishes they had for sale. Yet after journeying miles across London, on bus or tram, all that could be seen in these places never seemed to amount to more than some short-tailed guppies, common or gold, the ubiquitous Mexican green swordtail and moon platies.

FROM STICKLEBACKS TO TROPICALS AND ON TO GOLDFISH

by

M. D. Cluse

(President, Goldfish Society of Great Britain)

FIFTY YEARS AGO there occurred an event which transformed the scene for the amateur aquarist. It led to the first organisation of aquarists in Britain, which in turn led to the staging of the first aquarists, shows open to the public, and later to the drawing up of the first British standards for fancy goldfish. I refer, of course, to the publication of the first issue of the *Amateur Aquarist*, edited by the late A. E. Hodge, whose enthusiasm, imagination and optimism were to have such catalytic effects. I am probably one of the very few people now active in the aquarists' world, who bought that first issue. It had a profound and lasting effect upon my life interests and my friendships. Perhaps, therefore, it is appropriate that I should recall for the benefit of present readers, what things were like, half a century ago, so that they may appreciate the big changes which have occurred.

Although living in the built-up area of Islington, North London, my interests were of a "naturalistic nature" and like many boys and girls at that time, I collected specimens of many living things. Some took up botanising or egg collecting, but others whose environment did not permit this, collected caterpillars and butterflies, or searched the ponds and streams for aquatic creatures. In my case it entailed long walks and train rides to visit places in the Lea Valley. Using my hands, I caught sticklebacks, stone loach, tadpoles, frogs, toads, newts, water snails, and water insects. I collected water plants of various kinds. At first the very small aquarium I had proved inadequate, but it was possible to buy "bloodworms" in a portion of leaf mould (really intended for cage birds). Then my father purchased a second-hand all glass aquarium, about eighteen inches long. This emboldened me to make visits to the emporium of Mr. B. T. Childs, who had a shop in Pentonville Road near King's Cross station with supplies for anglers and aquarists. He stocked many British and foreign coldwater fishes suitable for aquaria and ponds. Over several years I brought home Prussian and ordinary carp, roach, gudgeon, tench, minnows, etc. At first there were many stinking disasters because of overcrowding, wrong foods and putting in plants, although the aquarium was poorly lit (no electricity). My father who was my aider and abettor in all this, brought home a second-hand book, *The Aquarium*, by J. E. Taylor, published in 1901 and largely relating to aquarium keeping (including public aquaria) in the latter part of the nineteenth century. This was a great help to me as I had read nothing on the subject previously. I learnt about the volume of water required by each fish and how public aquaria

were aerated. But we had no electricity and the various electrical gadgets now available were not known then. I had never seen a pool in a garden, but by the time I was eighteen years of age I had constructed a coffin-shaped concrete pool about six feet long into which I put various kinds of British freshwater fishes and I soon observed how they loved to gather into the stream of water gushing from the hose. I was cut off from all contact with other fishkeepers. Inevitably I made many mistakes and it is surprising that I persevered especially when we moved into a flat. No doubt there were thousands of aquarists like me who were struggling along in solitary ignorance and these would have included those who had progressed from the bowl of goldfish stage and anglers who had brought home alive some of their catch.

In 1924 the first issue of the *Amateur Aquarist* was published and I probably obtained my copy from the shop of Mr. B. T. Childs. This publication and the issues which followed opened up new horizons for me. Moreover, for a subscription of 4s. 4d. per annum, one received four quarterly numbers post free, and also the right to participate in the activities of the British Aquarists Association such as meetings, lectures and rambles. Seven branches were soon formed. Four were in London, another in Birmingham (Hon. Sec., W. Harold Cotton), another at Norwich and one in Glasgow. I joined the North London branch at Wood Green and began my further education. Not only did I see other people's aquaria, clean and bright with fishes previously unknown to me, but I was also taken on rambles to gather specimens and taught how to catch *daphnia*. For the latter operation our favourite spot was an old gravel pit which was being filled with rubbish. This was somewhere near the junction of North Circular Road and Cambridge Road (A.10—not then constructed). None of us then had cars to transport our cans and so we went by push-bike or motor-bike. At this time and for many years my main mentor was Les Katterns. I visited the home of A. E. Hodge at Southfields. In his garden were a number of enclosures for tortoises, batrachians and reptiles. In his house were his aquaria and I can recollect some beautiful silver bream which I have not seen since that time in home aquaria. As a result of this communion between aquarists it was decided to organise an open show for aquarists in 1926. This was the first national open show for amateurs and possibly preceded local open shows. The venue was Sea Anglers Hall in Fetter Lane, E.C., which was later dstroyed during the War. The classes were mainly for coldwater fishes for aquariums, but a good display of British pond fishes was put up by Mr. E. C. Le Grice, of Norwich. Some coloured casts of fishes were also put on view by Mr. A. Fraser-Brunner. Two vivid impressions stay in my mind. The first was a glass aquarium furnished with "giant anacharis" and containing specimens of what we would now call orange-metallic fantails. The second was my first viewing of tropical fishes. They consisted of green swordtails (wild type) and *Lebistes* (wild type). We knew the latter as rainbow fish, and they were used to combat malaria by eating mosquito *larvae* in tropical lands. D.D.T. had not been discovered at that time. The second annual exhibition was a five-day show and was held at Chelsea Polytechnic Hall and I was on the Show Committee. There were 12 classes for goldfish varieties, six classes for other coldwater fishes, six classes for tropicals (including only one class for livebearers!). (The name "guppy" gets mentioned here). Two classes for aquarium plants, two classes for batrachians and reptiles and two more for other aquatic creatures. In the meantime it had become obvious that membership of B.A.A. could not be given away with the subscription for the *Amateur Aquarist*, because the expenses of running shows and various other organisational costs made it necessary to call for a separate subscription, but leaving the A.A. as the organ of the B.A.A. I married in 1927 and dropped out of central committee work, but kept in touch by helping at shows, etc. The third Annual Exhibition was held at Trinity Hall, Great Portland Street, London, W.1 for five days. Eventually B.A.A. got into financial difficulties and was unable to pay some of the bills which resulted from its annual shows.

Somehow or other the association must have been reconstituted and went on to draw up the first British standards for fancy goldfish, but I was not interested in those at the time. Indeed, I had taken up tropical fish-keeping in a small way, accommodating them in a small garden shed with some glass panes in the roof. I had no electricity out there and so I heated three well insulated glass aquariums with two small oil lamps placed under the tanks. Of course I had some guppies which did not have fancy shaped finnage at that time (1933). I also bred black platies which in fact were half green. Somewhere around 1934 I acquired a pair of brick red swordtails which were a novelty at that time. They proved to be infertile hybrids. A large pet show was held in Olympia in November, 1934, and I must have been an official in the aquarists' section as I have a photograph from *Cage Birds* of me with the judges inspecting goldfish classes, although I was not particularly interested in gold fish at that time.

Many local aquarists' clubs had been formed by that time and B.A.A. in 1935 attempted to group them together nationally with elected representatives on a central B.A.A. committee. As far as I am

aware nothing came of this initiative, partly because of jealously local independence. In that year I moved to Potters Bar, where I had a large garden in which I constructed a pond and bred some shubunkins therein. Thereafter I dropped out of aquarist society affairs. Then came the War.

After five years of black-outs, bombing, rocketing, rationing, "digging for victory" and Home Guard duties, without any holiday to get away from it all, I began to feel the need for some light relief. I was fortunate that my home was not badly damaged and that my places of work were not hit while I was there. Nevertheless, it was all a bit wearing. Then we began to see some light at the end of the tunnel. The Allies had landed in Europe. The invasion of England was no longer feared and the Home Guard was stood down. The V2 rockets were still coming over at intervals, but as they gave no audible warning of their approach, they were not so psychologically detrimental as bombers and V1s.

At the time I worked near Gamages, which miraculously was virtually unharmed. I used to visit the store during my lunch times and found that in its aquarium department, there was a room devoted to tropical fishes. They must have relied on British bred fishes. Here I could lose myself in a world of fantasy and colour. So I bought a few platies and put them into a three gallon glass aquarium which I heated by partly immersing a blue incubator lamp bulb. Supplies of everything were very short or non-existent, so it was a case of make do or mend. I tried to trace some of the pre-war aquarists' clubs, but they seemed to have disappeared. Nevertheless, I continued to visit the tropical room at Gamages. Then occurred one of those quirks of fate which lead to a string of unforeseen consequences.

I got into conversation with another aquariums gazer and asked him if he knew of any aquarists' clubs. It transpired that he lived in my road in Potters Bar and that there were three other aquarists who were his near neighbours and who kept tropicals and shubunkins. I soon joined this group and through them discovered some of the I.C.I. staff at Welwyn Garden City. So our little Potters Bar group used to travel there in my little Austin Seven with masked headlights. The Secretary was Harold Dunbar, a pre-war aquarist in London circles. There we met Bert Upchurch from Hitchin, who had managed to maintain his excellent strain of Bristol Shubunkins. We soon found that the number of kinds of tropical fishes available was very limited. Even aquarium plants were hard to come by and we acclimatised hornwort to tropical conditions. We managed to find small manufacturers of aquarium frames, but even then the glass was difficult to obtain because generally it was only being sold for the purpose of repairing bomb damage. When aquarists' clubs were quickly reforming just after the war, Harold Dunbar who had contacts with various clubs was involved in the resuscitation of the F.B.A.S. and became its secretary. Gradually fishes and aquarists' applicances became available. Because of prodding and initiative of Harold Dunbar, it was decided to try an inter-club show to be held at 7 p.m. on Saturday, 5th October, 1946 (most people worked on Saturday mornings then) in the Church hall in Potters Bar, which was roughly equidistant between the localities of the main participating clubs, Enfield, Enterprise and Herts. Each club or exhibitor to provide own tanks.

As an entirely new innovation, twelve clubs competed in a furnished aquaria section. Their tanks (some of which leaked badly) were set out along the front of the stage. The *Amateur Aquarist* and *Water Life* each had a stand. The event was publicised through the F.B.A.S. We had no idea how many would attend, but it proved to be very popular. Too popular in fact. A coachload arrived from East London during the afternoon and as it was pouring with rain and there were no restaurants in Potters Bar, we allowed the crowd into the hall while our inexperienced helpers were setting up the tanks, installing the lighting and heating arrangements. It was most difficult to get from one end of the hall to the other and I had to ring a handbell to get quiet whilst I shouted instructions to the stewards.

I met Len Betts for the first time as he was one of the judges and later this led him to invite me to join the Goldfish Society of Great Britain in 1948 when it was formed. I had to learn genetics, to select my breeding stock, to selectively cull the fry to improve the strains over several generations. All this was a new approach for me and absorbed my interest for the next quarter of a century. Despite the shambles at the Potter Bar show, it was regarded as a trial run which had broken the ice.

The idea of inter-club shows caught on and show secretaries were able to learn from the mistakes made there. Having stirred all this up, Harold Dunbar departed for Australia and I heard from a recent visitor from Victoria, that he is now a leading light in the Aquarium Society there!

The Editor invited contributions regarding the changes us veterans have witnessed. What I have written is one man's memories of things which are perhaps historical now, but I hope that I have not been too long or boring. I come back to A. E. Hodge. If he had not had the energy and initiative to start not only the first British magazine for aquarists, but also to have founded the first British Aquarists' Association, would the hobby in this country now be as supine as it appears to be in many European countries?

FIFTY YEARS ON

MEMORIES OF PROGRESS IN THE WATER WORLD

by Eric Hardy, President of the Merseyside A.S.

THE GOLDEN JUBILEE of *The Aquarist* is a milestone in publishing history. In 1924, the hobby was truly for the "*Amateur*" *Aquarist*. Those of us whose parents didn't hold shares in wartime aircraft industries had little spare cash. It was a time of cold-water and marine aquaria before the advent of electrically-heated tropicals. More tanks were stocked then to study the natural history of native species than for anything like modern fish-shows. There wasn't a foreign fish in Liverpool Museum's public aquarium whereas they dominate its present aquarium. I never knew of the old M.A.S. holding a single pre-war fish show.

The microscope was still in its heyday as a toy. From Manchester and Birmingham more people went pond-dipping, not for *Daphnia* to feed their fish, but for rotifers and diatoms to set up on slides to amuse their winter evenings. Only 4 years younger than the Quekett, Liverpool Microscopical Society then had 150 members: nowadays its surviving few meet around one table. It was still two years before Merseyside's first Aquarium Society was formed by the late Fred Jefferies, an *Aquarist* referee on pond-plants. It was a year after I represented my school at a special lecture in the British Association's meeting in Liverpool. I well remember the fascinating discourse, on the common snail, illustrated with a microscope-slide of its radula, or ribbon-tongue, projected on the screen in the old Picton Hall.

A striking change has been many more women sharing the hobby of fish-keeping. Societies were full of lonely old maids, particularly hopeful teachers, who seldom took office. What old fogies they were (and the men!). No field-meetings were permitted on Sundays. The toll of the 1914-18 war left an appreciable gap of young men between 20 and 40, unlike the aftermath of the last war. From his home in Astonville Street, Southfields, A. E. Hodge built up *The Aquarist* at 1/- a quarter to attract the more far-seeing naturalists rather than these worshippers of tradition out of touch with the future. It was quoted widely in scientific works on botany and entomology as well as freshwater fishes.

There were a few lady pioneers. In 1918, Miss Annie Dixon began her watery life collecting *protozoa* from the green, peaty pools on Lindlow common, near Wilsmlow, now a built-up Manchester dormitory.

In recent years, the M.A.S. has held field-trips to Anglesey and Birmingham water-plant nurseries whereas in 1931 the old M.A.S. went collecting no further than for pond-beetles and water-crickets by the Manchester Ship Canal at Warrington, stocking their tanks with minnows, roach and perch from now polluted Padeswood Lake at Buckley in North Wales, Liverpool's nearest haunt of palmated newts. Or collecting bullheads and nine-spined sticklebacks, and sweeping netfuls of dragonfly-*larvae*, pond-skaters and *Planorbis* shells from the now filled-in brackish pool behind Leasowe Embankment, by the Wirral sea. The latter pool was famous for water-spiders, which fed on the swarms of *Gammarus*.

I wrote an article that year on Jefferies' current efforts to start his public aquarium at New Brighton. I still have lots of his notes and letters. Captain W. O. Hopewell's liner was then bringing "swops" from New York Aquarium, like a short-nosed bony

garfish, rarely seen in British aquaria. There were no trade shipments arriving from Singapore like nowadays. In 1931-2, members put in 2,285 working hours, an average of 44 per week, reminiscent of the present society's band of workers for their annual fish-feat, always the best amateur exhibit in Liverpool Show. The old aquarium reared 150 young from a hatch of the *apuana* variety of alpine newt, the only stock then in the country.

People who wished to delve in ditchwateristics before Jefferies started his aquarium society had to join a rather expensive and aloof Biological Society, meeting at the university. It has since withered away. It pioneered in marine biology to the neglect of freshwater life, a position the university reversed in recent years.

By the mid-30s, however, things were very different. Though without the present jobs for the new boys, conservationists were active enough to get the 1937 export of Chinese white cloud mountain-minnows banned. Then the Malayan government limited the export of harlequin fish to *bona fide* dealers under quota. Breeding and showing tropical fish was extensive. Pre-blitz Brighton Aquarium attracted the trippers in at the standard public aquarium charge of 6d a time, while Liverpool Museum aquarium extended its exhibits to sub-tropical reptiles and an alligator-tank. Worksop transported Mr. Sutcliffe's aquarium from Grimsby to Memorial Avenue park, as a public venture. East London A.S. fish-show was one of the annual events, doubling its size to 34 classes opened by the Mayor of Barking. In his Richmond, Surrey, garden, my friend the late L. G. Payne had probably the first amateur open air vivarium outside Whipsnade's walled and moated rockery of snakes and lizards. He was in a bank.

The biggest changes since 1924, apart from tropical imports, have been in our native water-life and our access to ponds and waters. These have been filled in by speculative urban building estates and drained by improved rural farming, to the loss of much aquatic plantlife (especially in Cambridgeshire). In the March 1937 edition of *The Aquarist* I mentioned finding natterjack toads from the Solway marshes to the West Lancashire dunes below Southport, Leasowe and Hilbre in Cheshire and to Prestatyn. The latter haunt has gone and vigorous efforts are now being made to save the remnants at the others. In March 1940, I wrote of water-beetles. By 1960 DDT sprays had reduced them from many old haunts. The Severn has been occupied by barbel and the chub exterminated from the Dee. Little ringed plovers have come to nest by many gravel-pits and inland pools, and creeping New Zealand willowherb has travelled alongside mountain streams.

It is in the interests of fish-keeping and freshwater biology that *The Aquarist* should survive the next half-century. It is one of the few good links between amateur and professional aquarists. There is still much useful work done by life-long amateurs with a great background of field-experience or tank-work in a special area or subject. Professionals only too readily admit this when they find how much time-consuming work there is in field-work, and seek the amateur's time and experience to fill-in their grant-

Eric Hardy when leading a Field Study Group in North Wales

aided surveys and theses. If all the people working on natterjack toads, from biology to conservation, in south-west Lancashire alone would sit around a table and discuss their studies and problems amicably, there would be less suspicion and jealousy behind the scenes.

Such a medium brings the fish-keeper to appreciate the ecologist's approach to the subject and the, perhaps a little snobbish and aloof, university student, or Ph.D., to tolerate the fish-show. After all, the late Dr. Francis Manning, from Cheshire, began, before he got his B.A. and Ph.D., as an enthusiastic pre-war member of Belle Vue Aquarium Society, where I first met him going to its shows and eagerly awaiting each new issue of *The Aquarist*. Fortunately, it has never descended to the wise-cracking almost illiterates of some North American pet-keeping magazines. Our only fear is the steeply-rising cost of printing and

publishing specialist magazines, which can never hope to be a profitable venture. I would finally add that I am grateful that writing since pre-war in *The Aquarist* (and now defunct *Water Life*) brought me many new friends, but not, I hope, any enemies! I have brought home some of the interests and pleasures of my visits to the ponds and rivers, which I exchanged for the laboratory many years ago, and shared them with the readers of my notes. My typewriter has not always been such a tripewriter as proclaimed by critics of my stubborn stand for the right of every amateur, to study natural history in the countryside.

IT IS 54 YEARS of fieldwork since Eric Hardy wrote the nature notes in his junior school magazine in Liverpool and over 40 since he began contributing to *The Aquarist*. The printed 1933-34 report of the council of the old pre-war Merseyside Aquarists' Association thanked him by name for his practical help. He has taken an active part in many natural history societies since pre-war and was among the handful of Lancashire naturalists who met in a room in Manchester University in February, 1962, and decided to call an inaugural meeting to form the Lancashire Naturalists' Trust, though he took no office in it. He has normally never taken more than a working position with societies, except when he accepted an honorary membership of Liverpool University Biological Society in 1940, and presidency of the post-war Merseyside Aquarist Society in 1959 and again in 1973-74. For two years he was honorary secretary of the Jerusalem Naturalists' Club and for over 21 years a Ministry-appointed member of Lancashire & Western Sea Fisheries Committee. Since 1935 he has been an annual tutor in natural history for the W.E.A. in Lancashire, Cheshire, etc.; he is also a part-time tutor for Liverpool University Institute of Extension Studies, and has been a past tutor for Oxford University department of extra mural studies. First broadcasting in 1936, he now gives a twice weekly "Countryside" programme on B.B.C. Radio Merseyside. Author of a number of books, his latest is "The Naturalist in Lakeland" (David & Charles, 1973). He formerly edited "Nature Lover" and other nature magazines, has written for a number of newspapers and magazines since pre-war, often in controversial vein, believing strongly in the right of all conservationists and serious fieldworkers to participate in natural history and is an opponent of class distinction and privilege in natural history. He is on the Lancashire executive of the C.P.R.E. A Royal Signals officer (Army Pigeon Service) in the last war, he organised a scheme for army naturalists serving in the Middle East to collect specimens for the British Museum and Jerusalem University, and to participate in field expeditions. His wide interest in life sciences ranges from freshwater and marine fishes, especially British, to aquatic plants (he writes the weekly garden feature in *Manchester Evening News*), birds, reptiles and amphibians. In 1949 he addressed the Federation of Northern Aquarium Societies' assembly at Manchester Belle Vue, on his studies of the fishes and aquatic life of the Jordan and Dead Sea waters. He formed the Merseyside Naturalists' Association in 1938 and has been its honorary secretary ever since. He has lectured to numerous schools and soceities all over the country. He is a Life Governor of the Imperial Cancer Research Fund.

EDITORIAL.

IN the opening number of "The Amateur Aquarist" I ventured the conjecture that there was a desire amongst those interested in aquatic life for such a magazine as this.

From the hearty support which has been forthcoming, and the many encouraging letters received, it is evident that I have made no mistake.

Voluntary effort on behalf of the magazine has come, not only from the ranks of aquarists, but from naturalist, scientific and educational circles generally.

To subscribe to a magazine non-existent at the time is a somewhat severe test of faith, but my expectations in this respect have been more than realised.

I tender to all these pioneer supporters my sincere thanks.

As it is impracticable to "broadcast" indiscriminately a magazine of such specialised interest as "The Amateur Aquarist," I trust that all readers wishing its speedy enlargement—a development already contemplated—will lose no opportunity to induce others to become subscribers or order copies regularly through a local newsagent.

The larger the circulation, the larger the magazine.

As promised in the last number, I now put forward a scheme whereby annual subscribers may take part in moulding "The Amateur Aquarist" to meet their own views.

I propose that each subscriber send me a postcard suggesting a feature he or she would like incorporated in the magazine. From these I will choose several which appear to have a more general appeal and publish them in numerical order.

If each subscriber then forward a second postcard with a cross against the number of the suggestion approved (as at an election), I shall adopt the issue of the vote.

In the case of those who do not reply, I shall assume that they are satisfied with the magazine in its present form.

Only those whose names are on the subscribers' list will be entitled to vote.

For the sake of conciseness, it is hoped that replies will be restricted to postcards—or I may have some difficulty in unravelling the suggestions!

A. E. H.

Above is A. E. Hodge's Editorial from the 2nd issue of the Amateur Aquarist, June, 1924.

SOME RECOLLECTIONS OF THE AQUATIC TRADE

by Charles Schiller of Springfield Electronics

Charles Schiller's knowledge of the Aquatic trade spans a period of almost sixty years. Below he recalls the growth of his own business, and some of the fascinating characters it has brought him into contact with.

FOR ME it all started before the First World War, when I was only eight years old. My father was the Court Florist and held the Royal Appointment for Edward VII and George V and his very exclusive establishment was situated in Wigmore Street, London W.1. My interest grew with the years and in 1926 I built, what I believe to be, the first chromium-plated steel-frame aquarium, which I proudly installed in the shop near the cash desk. This created tremendous interest, and before long I was inundated with requests from people who wanted a similar tank of their own. And so it was that by the beginning of the Second World War I had a staff of 26 who did nothing but service aquaria all over the West End of London and beyond. As far as I know, at that time ours was the only concern selling or devoting our attentions exclusively to tropical fish—we had nothing to do with goldfish, although I believe there was much more money to be made out of them at the time. Our clients included many doctors, dentists and consultants in the district, and eventually our fame spread further afield. I remember one noble Earl who had an estate in Leicestershire. We installed a very beautiful tank there, but unfortunately they were in the habit of giving wild parties, as a result of which—usually on the Monday morning—we had to send staff all the way to Melton Mowbray to re-instal the tank, which might contain the contents of a bottle of whisky which had been given to the fish for fun!

My parents became so interested in my hobby that they allowed me to use the first floor of the Wigmore Street premises as a showroom—in fact it was there that we held the first meeting of the Guild of British Aquarists, which was a society formed by people in the trade—in those days mostly goldfish purveyors. Eventually the property next-door also became available, and it was decided that, as my aquatic business was expanding fast, I should take these premises also.

The first immersion heaters were made in my father's cellar in Wigmore Street. When Pyrex glass was invented in the late 1920s, we started using it as a cover for our immersion heaters, which previously had been enveloped in a mica wrapping and then sealed in a brass tube and nickel-plated. We made all our own aquaria, and when a local wrought-iron manufacturer decided to give up business we took the firm over together with a number of the staff. This gave us our first real entry into the manufacture of aquariums on a large scale. All aquariums were turned-out with polished slate bottoms—these were much sought-after because it was considered that the plants grew very much better. Eventually bi-metal (which originated in the U.S.A.) became available in this country and we began manufacturing thermostats, which were very accurate, considering the crude way in which we originally made them.

In those days the Germans knew so much more than us about the hobby, and we constantly turned to them

for supplies. Apart from a few fishes brought over here by amateur enthusiasts, Germany was the main source of new specimens. Two young men in Hamburg started a business known as 'Aquarium Hamburg', and subsequently we became their English agents. Being situated in such a busy port, they used to send students all over the world to collect fish. It was quite usual for them to book space on a ship—perhaps two or three cabins, which they had specially heated, and air laid on. There were no plastic bags in those days, and the fish used to come over either in aquaria or in large tanks. When my own stocks became really low, I used to book a cabin on one of the tramp steamers going out from London Docks, go over to Hamburg and bring back specimens—perhaps 5,000 or 6,000 at a time. In those days the journey used to take about 48 hours. There was no radio, and once you were away from London nobody knew where you were until you arrived in Hamburg. 48 hours in one cabin in a rough sea was no fun, I can tell you!

Aquarium Hamburg soon built up a fine reputation throughout the world. Between the wars the company decided to teach America the hobby, and opened-up a depot along the Hudson River some 35 miles or so from New York. The two partners used to do turn-and-turn-about: one would remain at the parent company in Hamburg whilst the other would be in the States. I re-visited Germany in 1949 to see if I could re-establish business connections. As you know, Hamburg was in a state of almost complete ruin, and I was more than surprised to find that their buildings were still standing together with those of the Women's Clinic in the next block.

Another regular source of supply over the years has been a certain well-known Chinaman in Singapore. At one time he built-up a very thriving business supplying the Germans, and occasionally there was enough to spare for us. We used to ship them in the care of the ship's baker on the P. & O. boats—the old 'Rajputana' and the 'Rawlpindi', unfortunately both sunk during the War. A large number of Rasbora and similar fish were brought over by Japanese crews who kept them in the kitchens. I once called at the Docks to inspect some fish which had arrived for me and found that in the large kitchen on one of the Japanese boats, the kitchen ranges had been closed down, and a number of the ovens lined with zinc trays in which the various fish had been put. On one occasion a ship had to put into Marseilles on the way home because the crew had used all the available fresh water on board. The small tropicals used to come over in large earthenware crocks in which the travelling Chinese are reputed to put the remains of their families who die en route.

Development of the hobby was very steady between the wars but when hostilities broke out in 1939, all imports ceased and very many of us were called-up. My connections were completely severed until 1946 when I returned home and opened my own retail aquarist shop. Sometimes on Saturday afternoon I would close the shop, dash off to London Airport, and get a flight over to Hamburg or Brussels. I was looking for Neons, which I discovered could be purchased either in Hamburg or Liege for the same price. It was a complete mystery to me where these fish originated, although it was rumoured that they were bred in East Germany and smuggled over the border to the Western Zone. Incidentally, I imported the first Neons ever to be seen in this country—I think it was about 1936. In those days I used to

Annual outing of the British Aquarists' Association in 1929. Charles Schiller is on the left of the back row, with Mr. Freeman of Waterloo Goldfishery on his left. L. Katterns is fifth from the right of front row of those standing.

travel by Hillman's Airways, which was a line run by a London taxi owner who specialised in cut-price fares to the continent. He had a fleet of De Havillands, and this could be quite a lot of fun. I used to bring back 100 Neons at a time, and if I remember correctly we paid £1.00 each for them.

During the past twenty-five years I have spent a great deal of time travelling all over the world, and the aquatic trade has seen many changes. Until about two years ago, anyone wanting to heat an aquarium in the home generally used what we call 'separates'—that is a separate heater connected to a thermostat. Although a number of firms developed an automatic heater with a thermostat in the same tube, it was a long while before these caught on. Now it appears that nobody really wants the separates except those few hobbyists who have more than two or three tanks. Combined heater/thermostats are so sophisticated nowadays, and the results so regular, that to mess about connecting wires from one small instrument to another no longer makes any kind of sense.

Now that I am fast approaching seventy, looking back I can recall many interesting and a few almost eccentric characters, most of whom are sadly no longer with us. One of the latter was poor old Freeman of Waterloo Goldfishery who met a rather untimely end. It was his habit to collect a few water plants before breakfast, and one day he failed to return. We believe that he must have suffered a heart attack, because his unfortunate wife eventually found him in the pond with his head well and truly stuck in the river mud.

Mr. Walter Woolland of Woolland's of Knightsbridge provided us with one of our most interesting commissions. He became a real tropical fish enthusiast and decided that he wanted to breed Mollies. It was arranged that one of my suppliers in Florida would put on the steamship 'Washington' in New York, 80 cans, each with a trio of Mollies. In those days they were worth about £7 10s a trio, and I shall always remember going down to Plymouth to meet the ship and bringing the 80 cans up to London. A special first-class coach had been reserved, and the engine put on two hours in advance in order to heat up the carriages. Subsequently Mr. Woolland became so interested in breeding this fish that he asked us to build several 16 ft. long aquariums on the first floor of his building.

A French Count came into my shop one day and purchased out of hand a 24 in. aquarium with chromium-plated edges. He also bought all the trimmings—heater, thermostat, sand, rock plants, a selection of fish, and when I asked him where he'd like it delivered, he said: "Oh, I have a flat on the Champs Elysees in Paris, here is the address." So the next day I had to go over and instal the tank. Fortunately I was able to get back by teatime—Hillman's Airways again! The French now have exquisite taste in aquaria and accessories. I find it difficult to imagine a similar incident taking place today.

I recall another occasion just before Christmas 1934. I was closing my shop somewhat late when I observed a large black face trying to look through the window which was covered in mist. I answered the door and invited him in. He was a very large gentleman indeed and exquisitely dressed for the City—bowler hat, rolled umbrella and a beautiful overcoat. He apologised profusely, but eventually entered the shop and asked the price of nearly everything on show. As he was about to depart, he turned to quite a nice outfit I had there and said: "How much is that?" "£25," I said, hoping desperately to get rid of him. "Wrap it up," he replied. Well, of course, you can't wrap up a thing like that, but I suggested that if he liked to send transport for it (it was obvious that he wanted it in a hurry) I would arrange to instal it free of charge. In those days we normally charged about five guineas to go to someone's house and instal a really nice outfit. A car duly arrived, and when my staff returned, having completed the assignment, they reported one very satisfied customer. The following day was Saturday—early-closing day—and having nothing to do until meeting my fiancée in the evening, I decided to go round and inspect the job for myself. The house in Camden Town was a large Georgian mansion, but the district itself had been allowed to run down and was rapidly deteriorating into a slum. The door was opened by a rather sleazy looking Irish maid who invited me in. From inside the house there suddenly appeared an apparition dressed in a pair of old, very soiled flannel bags and an athletic vest. With a sense of shock, I recognised my immaculate customer of the previous night. He was extremely cordial, said how pleased he was with the aquarium and invited me to look over the house. Well, I have never seen anything else quite like it. There were the most beautiful antique furniture and objets d'art. The man obviously had exquisite taste. Apparently he had made a great deal of money and decided to invest in beautiful things. Having looked over the house—which left me almost breathless—we went into the huge dining room. Running down the centre of the room was a large refectory table, beautifully set, with lace mats and silver. A great dish sat in the middle containing fruits out of season, and in the corner was a very large hot-plate. On the other side was a 3-manual electrically blown organ! My host insisted that I stayed to lunch, in spite of my statement that I had already lunched some two hours earlier. We were shortly joined by three gentlemen who looked suspiciously like thugs, and whom I supposed were his bodyguards. They looked and behaved in a manner reminiscent of all Hollywood gangster films you ever saw. We all sat down, and the maid entered

carrying a large covered dish which she put on the hot-plate. I wondered what exotic feast lay beneath, and was much surprised to find that all the ceremony was due to a plate of sausages and mash.

Before leaving I received a further invitation for my fiancée and myself to attend dinner on the following Tuesday evening, and a polite request was made that we should dress for the occasion. We turned-up at the appointed time, and were introduced to a number of guests, all of whom were in formal dress, like ourselves. However, there was no sign of our host who, it transpired, was down in the underground kitchens preparing the meal. He later explained that when he gave a dinner party he liked to send his cook out for the night and do everything himself. There were eight courses and everything exquisitely served. Our host insisted upon serving all the courses himself, with the aid of the two maids, but still dressed in his old flannel bags and vest! I called to see him at his City office shortly afterwards—a superb apartment, very much after the style of his house but everything in complete contrast to his weird apparel at home. He subsequently ordered a number of aquaria in most unusual shapes—one was a half-moon, and I know where this tank is today, still in running order. He was, in fact, one of the cleverest of share manipulators in the City, much sought-after by the underworld, to whom he regularly gave advice. It is very strange that beautiful things often seem to go hand-in-hand with people like this. As a matter of fact, two of the biggest international crooks of the time were very good customers of ours. But let me tell you of a rather different type of client whom we served for many years.

Now in those days it was my habit to go into work before breakfast, and one early morning a very well known customer of mine poked his head around the corner and asked if I would arrange to instal an aquarium at No. 145 Piccadilly. During breakfast I happened to mention this to my parents, and they said: "Oh, yes, the Duke and Duchess of York." So of course I was determined to give them something very special. The aquarium was first installed in the children's playroom—the children being Princess Elizabeth and Princess Margaret Rose. The following day I was summoned by the Duchess—now the Queen Mother—who remarked that the aquarium was far too beautiful for the children, and requested me to transfer it to the morning room on the ground floor. There was an awful lot of work involved, but I was well rewarded. Every visitor to the house saw the tank, and this provided a first-class introduction to many valuable clients. When the family moved to Buckingham Palace after the abdication of Edward VIII, both the tank and our activities transferred with them. One day the Queen (as she then was) noticed that her little red guppy had become very fat, and she asked her page to enquire as to the reason. Once more I was summoned to the Presence, and I explained that the guppy was a live-bearing fish, and would eventually produce young. Their Majesties thought this was excellent news, but were dismayed when I explained that as fast as the new fish were born they would probably be eaten by the other residents. However, I agreed to lend them a small tank in which to isolate the mother. As many hobbyists will know, these live-bearing fish will occasionally hang fire and decide not to produce for a time. This was unfortunate as the Royal Family were going away the following weekend for a holiday. Their departure became imminent and still no small fish appeared. It occurred to me as I went to feed the fish each morning that perhaps it would do no harm on the last day to put three or four of my own little baby fish in the tank to avoid anyone being disappointed. This I did, and having completed my rather deceitful task, I returned to breakfast. I had hardly been home more than 10 minutes when a frantic call from the Palace told me of the happy event, and so, of course, back I went. I was more than happy to discover that following my earlier visit the guppy had in fact produced her own family, so I didn't feel such a cheat after all!

This hobby of ours has suffered many ups and downs. There have been times when it appeared that there was an aquarist shop on almost every street corner. Sadly, this kind of situation usually brings fairly widespread bankruptcies in its wake, although I believe there is still plenty of scope for the dedicated aquarists. So many folk have attempted to open shops on the strength of a few weeks' experience, only to find that the large profits they expected were just not there.

In order to succeed as a retailer you not only need years of experience but also the ability and patience to pass on your knowledge to even the most exasperating of customers. The effort involved is usually repaid many times over. At my age patience is a fading virtue! There was a time when I would have chased one particular fish round a tank containing six hundred Neons just to please a lady. Nowadays I must admit that I would feel more inclined to tell her to go and jump in the tank herself!

Seriously though, I am appalled at the number of shops in existence today which are either unwilling or unable to offer reliable advice. Before the War I was responsible for five different departments in Selfridge's, in addition to running my own business. I think the 'Old Man' must turn in his grave at the way that most so-called retail staff behave nowadays. I trust that future generations will see a return to genuine professionalism in all branches of industry, in which case, with a little luck—it is just possible that there is hope for us all yet.

From a Naturalist's Notebook

by Eric Hardy

AFTER recent efforts to conserve American alligators from leather-hunters in Florida, comes an effort by 15 biologists of Bogota University, Colombia, to save the four South American cayman species, equally endangered reptiles. Smaller than American 'gators, and their skin covered with osteoderms or hardy horny plates, they had little value to the trade until recent years. American and Orinoco crocodiles are already believed extinct in South America, 50,000 of the latter were killed in the Guayabero and Guaviare rivers during the last war and only three survivors were found in the 1950s.

Almost 5,000,000 skins of the black cayman, *Melanosuchus niger*, were traded out of the Brazilian state of Amazonas in 1950. In 1965 this had fallen to 33,000 because of reduced stock. It fishes the Amazon valley lakes of Brazil, Colombia, Peru and Ecuador. The small, heavily plated dwarf cayman, *Paleosuchus palpbrosus* and the smooth-fronted *P. trigonatus*, lack the prominent eye-ridges of large caymans, and are naturally more restricted in distribution, being relics of prehistoric armoured reptiles. The main target of the caymaneros or caymen-hunters from Mexico to Paraguay is the 5-7 ft. spectacled cayman *Caiman crocodilus*. Colombia exported nearly 600,000 skins in 1970. Its range is greatly reduced. Colombia legally "protects" black, dwarf and smooth-fronted caymans; Brazil "protects" black and spectacled kinds, and Peru has some size limits, but these laws are claimed to be flouted. There is also a trade to U.S.A. in baby caymans and stuffed specimens which the university is asking the U.S. Department of the Interior to stop, along with the import of skins, some of which are re-exported to Europe and Japan.

Turning to smaller reptiles, American workers now "bug" sea-turtles with telemetric methods to trace movements, and Colombia University's disclosure of chemoreception in the migratory sea-turtle bring it into line with the current theory on salmon-orientation back across the North Atlantic from the Greenland Sea to its river of birth by smell. American tiger-salamanders have been shown to use polarised light.

Juvenile and small species of lizard are usually insectivorus, but larger-bodied lizards are unable to meet their metabolic needs on insects alone and rely instead on vegetation, with high digestive efficiency. Temperature and light mostly influence their breeding cycle, but severe winters in Russia cause mass sterility in species whose food is seriously reduced, but not among those with other feeding habits. This would also apply to snakes caused by a major scarcity of their small mice food, but not others.

Several birds feed on lizards (like kestrels) or their tails (from thrushes to buntings), and likewise on salamanders abroad. In U.S.A., birds avoid taking the noxious red-cheeked salamander, *Plethodon jordani*, which has noxious skin secretions. They probably recognise the red as a warning colour (they avoid noxious red insects like burnet moths) because observations have shown that they also avoid red-cheeked varieties of another salamander, *Desmognathus*. This is called Batesian mimicry, after the naturalist Bates. By the way, U.S. field-studies mark salamanders with fluorescent pigment to trace their movements.

The rate of frog-tadpole growth and the time of metamorphosis has been shown at British Columbia University to depend upon temperature rather than food or population-density, as is generally assumed. Cannibalism is certainly in proportion to the density. Not all amphibians come ashore after breeding. A Graz University (Austrian) observer has shown a permanent aquatic living sometimes in the European fire-salamander. One of the Hartz Mountain varieties of this, called *taeneatus* (they vary in the amount of yellow or black), was at least 28 years old when it died at London Zoo. A giant Japanese salamander lived at Leyden, Holland, for 52 years.

Some time ago, I mentioned that most books on British fishes like Travis Jenkins', do not include Continental fish introduced and established here by anglers, like bitterlings, ide, etc. The Clown Dam at Doncaster was stocked with ide, or orfe, for instance, and Woburn Abbey lake, London's St. James's Park and Elstree's Hilfield Reservoir with golden orfe. In Holland's rivers they grow to 3 lb. or more. They also inhabit more rocky lakes in North Europe, as considered table-fish. They somewhat resemble chub with a small mouth and are often called silver orfe. They are more interesting to the aquarist than the angler as they don't take bait so readily as commoner members of the *Leuciscus* genus.

One of the most important new books to bring readers up to date on modern changes in distribution is the 401-page "Changing Flora and Fauna of Britain," edited by D. L. Hawksworth for the Systematics Association, and with subject chapters by leading authorities (Academic Press, £9·20). The ups and downs of water life alone bring many changes for the pond-hunter. An excellent chapter on our freshwater fishes, by Alwyne Wheeler of the British Museum,

spoiled only by crediting the discovery of the bitterling established in south Lancashire as a new British fish, to a 1963 publication by people who had no connection with this discovery, which was first published in 1954 in the Salmon and Trout Association Magazine, No. 142. Indeed, the first specimen was sent to me by Mr. Wheeler for confirmation beforehand, and it was mentioned in *Water Life*, *The Aquarist*, and the local Press, from which the 1963 re-recorders "lifted" their first information of its presence, without customary acknowledgment.

Wider field-experiences would have improved the chapter on amphibians and reptiles for it had no adder record from Denbighshire since 1960. I saw (and published) a fine female this spring in the Leet Valley, near Loggerheads, though adders aren't so common there as they used to be. Other Denbighshire locations in my experience are the moors from Minera to Mountain Lodge, above Lake Alwen Reservoir. There are several adder haunts where I've recorded population ups and downs on the Denbighshire moors, and near Ruthin's Clocaenog Forest where I've encountered them on friends' grouse-shoots. The chapter has no reliable grass-snake records since 1947 from Cheshire, though in that period I have noted them at Wynbynbury Moss, Nunsmere (Delamere), May, 1973, and at Dunham and Appleton. There has been a considerable decline in adders over the North-West in the past century, and of grass-snakes, but the evidence isn't clear whether this is due to ecological (draining and cultivation) changes or climatic.

Statements of 10,000 populations of natterjack toads and sand-lizards reaching "hundreds of thousands" on South Lancashire dunes is, in my 50 years' experience, grossly exaggerated, though the natterjacks were in thousands and the sand-lizards in hundreds up to 1930. The inland record of natterjacks at Rufford in Lancashire was one of several experimental pre-war introductions I made. Sand-lizards and sandhills once extended to Bootle and Liverpool's Clarence Dock (formerly Mile End Rocks) and natterjacks once swarmed in Liverpool's creek (Whitechapel) but that was over a century ago.

It is interesting that in modern times the tiny immigrant beetle *Stenopelmus rufinasus* has become widespread in southern Britain, feeding on the water-fern *Azolla filiculoides* almost wherever it grows. Another but decreasing insect, the rosy marsh-moth, was lost from its fenland haunt at Huntingdon, but was discovered in recent years at Borth Bog and Morfa Harlech, in West Wales, where its caterpillar feeds on bog-myrtle. The decline of amphibians seems almost worldwide. After being lost from Wicken Fen's flora for many years, the great fen ragwort *Senecio paludosus* has been rediscovered. In South Wales, the spread of the maritime form of wintergreen, *Pyrola rotundifolia maritima*, continues after being introduced from the Lancashire dunes. First by Coriscan pines at Towyn Burrows, it then appeared half a mile away in wet dune sand among convulvulus in the Forest Reserve, 500 yards seaward of the observation tower; another colony is half a mile south of this; another borders the main rides of the pine plantation, with bramble and foetid iris. It is also on Laugharne Burrows among grass, sea-pansy, yellow wort and yellow flag. Increasing in Glamorganshire's Kenfig Burrows are hundreds of plants, also 14 miles north-west on Crymlyn Burrows and eight kilometres east-south-east on Merthyr Mawr Burrows, as well as in Gower on Oxwich dunes, on Anglesey's Newborough Warren by the forestry south of Pandy, and on Devon's Braunton Burrows. Now, if you are thinking these locations should have been kept secret, blame the Botanical Society of the British Isles which, after circulating notices not to do this the other year, disclosed these precise locations in full in its journal recently, apparently intended as exclusive privilege for those able to afford membership.

PRODUCT REVIEW *(continued from page 263)*

be pleased also to hear from readers who have opinions to express on neon indicator lamps on combined units and on single thermostats. Neon indicators are reassuring—but are they of any value if they don't indicate to us when a heater element has burned out?

Although the Control-O-Mat does not carry a guarantee—in the usual sense of the word—provisions have been made for repairs to be carried out, should they be required. The instruction leaflet supplied with the unit states: "If it is necessary for this article to be returned for repair, please enclose a postal order for 25p, left blank, for return postage and handling. If in our opinion the article was defective in manufacture your postal order will be returned to you." Although this is not the "usual" form of guarantee, I feel that it is superior to those offered by some other firms where guarantees operate for one year and one has to pay for postage, packing and handling, if the item has to be returned, even if it's subsequently found to have been defective in manufacture. Try a Control-O-Mat next time you require a combined unit with easy facilities for adjustment. I doubt if you will be disappointed!

B. Whiteside, B.A.

Leiocassis siamensis

STRIPES AND BARS

by Bill Simms

THE bank of twelve tanks in this tropical fish shop was well planted, and altogether formed a really pleasing sight. Each tank was planted differently, and I walked along studying their layout, with a compliment in my mind for the aquarist who had set them up. I was concentrating on the plants, and hardly noticed the fish—until I saw the tank at the top right-hand end.

This one caught my eye because the fish in it were either barred, mottled, or striped, with well-contrasted colours. The total effect was such that it switched my mind from plants to fish almost at once. There were stripes running horizontally along the fish, some stripes that were more like bars running vertically, and some with markings that were irregular mottlings. All of them, though, were striking, and suddenly I realised how effective a community tank restricted to such markings could be.

I began to take notes of the more outstanding specimens, and started with a Barred Siamese Catfish, *Leiocassis siamensis*. This one was less than 3 in. long, but it can be found up to 6 in. or so. It is a comparative newcomer that is not often on sale, but is reputed to have a long life, so is well worth buying when you come across it. My own experience with it suggests that only the smaller specimens should be allowed in a community tank, and then only with fish of its own size or larger, for it will definitely engulf any fish it can easily get into its own mouth.

This Barred Siamese Catfish was bluish-black, but I have seen others that are a rich coffee-brown, and these I find the most attractive. These colour differences are probably just regional variations from different districts of Thailand, for it does not vary in colour when kept in an aquarium. This is a distinctly nocturnal species, and while smaller fish are sleeping is inclined to scoop them up. During the daytime it prefers to skulk under a stone, and therefore I always provide a flat stone resting firmly on two others that are well bedded into the gravel, for this fish will burrow into the gravel under the stone to make a suitable hiding place. It prefers a temperature in the middle 70's, and the water should be very slightly on the acid side, as well as being soft. Live food should be given at times, as well as the usual frozen foods, and it will search for these on the bottom.

Another nocturnal catfish I once had that would have been suitable for this tank was the Two-coloured Banjo Catfish, one of the *Bunocephalus* species, which I think to be *B. coracoideus*, but about which there appears to be some doubt. Mine was distinctly barred (as shown in the drawing) but others I have seen since were plain dark brown-grey, with hardly any markings visible. This one comes from Brazil and Uruguay, and is more tolerant of temperature and pH differences than most others. It reaches a length of 6 in., but 2 to 3 in. specimens are safe with other fishes of its own size.

Buno coracordeus

It is relatively easy to sex and breed, for a month of live food in the spring, followed by a change of half its water for same-temperature tap water, will usually start it off. See that there are some large stones on the bottom on which it can spawn, and then you may be able to watch it guarding its eggs and young—which it does by sitting on them.

Two most distinguished-looking bottom fishes in this aquarium were the red and black Clown Loaches, *Botia macracantha*, which come from Borneo and Sumatra (like so many other ornamental fishes). I have not kept these myself, but have seen them often, and have always been impressed by their colouring. If you can imagine a yellowish-red that is not orange for the body, deep red fins, and distinct black stripes, you have some idea of their appearance.

This is another fish that can reach 6 in., but most specimens are about half that length, and this one should be kept only with fish of its own size. Although it does move about at night, it is also fairly active during the daytime, and will at times run up and down the glass as if seeking to find other quarters.

Botia macracantha

Feeding these loaches is easy, for they will take anything at the bottom, like real scavengers, but some live food must be given at times to keep their brilliant colours from fading. Clown Loaches do not like a temperature much above 75°F, and their water should be well aerated and clean. There appears to be no external sign of sexual difference, and choosing a pair for breeding must be a matter of observing a number of them together, and looking for difference of behaviour in the spring.

In this tank, also, were some Tiger Barbs, *Capoeta tetrazona*, sometimes called the Sumatra Barb, from the same area as the Clown Loaches, and once again the evidence of thought in the set-up of this aquarium became obvious. These are most active fish, with an aggressive manner and a tendency to bite lumps from the fins of slower-moving fish, and so the specimens here were fairly small—about 1½ in. long—and I saw no evidence of fin-biting. The silvery-pink bodies with

Capoeta tetrazona

deep black stripes, and with deeper red decorating the fins and tail, make this a handsome fish. I am always reluctant to keep them with other fish except when quite small, but a small school of them—perhaps seven or eight—is reputed to be less aggressive to other fish, though I have never tried this. Certainly they are an ornament in any community tank, and in one designed to show striped fish only are essential.

Breeding the Tiger Barb is done regularly now, for they spawn just as do most other barbs, and are easy, provided that the correct conditions are provided. You must use water that is just a little bit softer than they have been used to, and see that it is the slightest bit acid. A temperature towards the upper end of the range between 72°F and 82°F suits them well, and the diet should include some live food. An essential requirement when growing on the young is to provide plenty of room for exercise. In a small tank the youngsters will remain small and stunted.

Leporinus fasciata

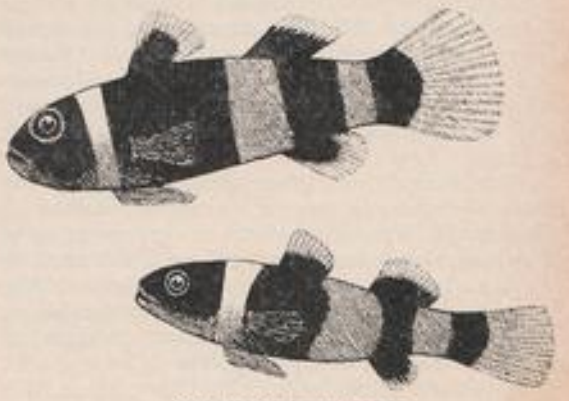
From the same countries of Sumatra and Borneo comes the Striped Barb, *Barbodes fasciatus*, which was represented in this aquarium by three fine specimens. The body colour was a pale metallic gold, and on this the horizontal stripes showed up clearly, making this fish more colourful than Zebra Danios, which it otherwise resembled.

Barbodes fasciatus

The Striped Barb is a peaceful fish that can be kept in the community tank, but has never become as popular as it should. It is relatively easy to breed provided that slightly acid water of about 80°F is provided. A dense mat of plants should cover the bottom, as with many barbs, and over this a true pair should soon spawn—if in condition. The female is distinguished by her fuller outline, and a less distinct stripe pattern, while the male becomes more colourful and more distinctly striped when in condition. This fish can reach a length of 5 in. or so according to the books, but I have always considered a 3 in. fish to be large. It is possible that, given ample room for exercise when young, a large fish could be produced, but I think that they are nicer for our purposes at about 2 in. long.

I had noticed a small bunch of lettuce leaves when I first approached this tank, standing in a central open space between the more ordinary plants, and had thought that they had been put there as a pale-green colour contrast to the other plants. Now I suddenly realised their true purpose, for coming from behind the lettuce I saw a 3 in. long Banded Leporinus, *Leporinus fasciata*. This decorative fish will insist on picking at plants in any aquarium, and can soon ruin them. Therefore it is wiser to provide some lettuce or spinach—preferably in leaf form—for them to eat. Their main diet is vegetable, but they take frozen foods and dried foods as well.

The colour of this *Leporinus* was very good, for the ground colour was a distinct golden yellow, barred distinctly with vertical black bands. So many specimens are pale—almost to silver—that this one stood out. It seemed evident to me that this collection of striped fishes had been built up around this fine specimen fish, and the effect was remarkably good.



Brachygobius xanthozona

Most of the time this fish swam tilted, head downwards, which is the normal posture. At times, however, they will shoot out of the water, at a distinctly up-tilted attitude, and so it is essential to keep a cover glass over their aquarium.

A species that was not in this tank, but that looks so attractive that beginners may fall for it, is the Bumblebee Fish, *Brachygobius xanthozona*. This small goby is mentioned here because it should never be kept in a community tank, for it bites other fishes whatever their size. The yellow and orange body, combined with its vertical black bars and small size, make it almost irresistible, but resist its appeal you must, unless you can provide it with a tank of its own. In this case add a heaped teaspoonful of cooking salt to each gallon of its water, and keep the temperature at 75°F. It feeds only on small live foods, for which brine shrimp *larvae* can be used.

Melanotaenia nigrans

THE ATHERINIDAE

by Jack Hems

Not infrequently the tropical fish enthusiast finds one or more of the following members of the family Atherinidae (Silversides or Sand-Smelts) in dealers' tanks: the dwarf rainbow fish (*Melanotaenia maccullochi*), the pink-tailed rainbow fish (*M. fluviatilis*) and the common or red-tailed rainbow fish (*M. nigrans*).

All the foregoing species are native to Australia. The first two species appear to be rather localised in Queensland. The third species is widespread or at least in evidence almost everywhere as far south as Sydney. (It is also said to occur in New Guinea.) Not unexpectedly, with such a wide geographical range, *M. nigrans* is the easiest to accommodate in regard to temperature. Ordinarily, it appears to be quite "at home" in the middle sixties (°F). Nevertheless, it is more sensible to keep it at about 75°F (24°C). Like its congeners, it is not averse to some salt in the water. It breeds, as does *M. maccullochi*, without any special preparations or attention from its owner. Yet it would be absurd, nonetheless, to say that it is possible to breed it without the right sort of environment. This, then, is a tank no smaller than 24 in. by 12 in. by 12 in. Next in importance is a good growth of plants. Plants with finely divided foliage such as myriophyllum or nitella are recommended. These should be set along the back of the tank and banked at both ends. Furthermore, a bright light is necessary for at least ten hours a day. (In a poor light, the colours and the normally high spirits of Australian rainbow fish stay subdued.) Rainbow fish in breeding condition display a brilliance which is especially striking in direct sunlight. This nuptial garb is accompanied by a great deal of rushing about. Every rush—the jewel-like males driving—is

directed at the plants. On reaching the plants the fish stop short before the hedge of vegetation or charge headlong into it. There they assume a side-by-side position, and shimmy or tremble momentarily while they release their spurts of yellowish eggs and milt. The eggs are provided with sticky filaments which cause them to stick to the vegetation. Incubation is completed in about a week and, providing the parent fish are not kept on a lean diet, both eggs and fry remain untouched. In any case, even if the parent fish do indulge in some cannibalism, there are always enough eggs and fry present to allow for some losses.

M. nigrans is not so spectacularly coloured as some of our more sought-after tropicals. All the same, there is no denying that the splash of red on the gill-cover and the horizontal rows of reddish and blue markings on a greenish to yellow ground make it a visually pleasing fish. As a matter of fact, it is not possible to describe with any exactitude the true colours of the fish, for the dark-edged scales reflect a number of delicate tints. Red, however, is the predominant colour.

M. nigrans attains a length of about 4 in. The two sexes are much alike (at a quick glance) but, age for age, the male is more streamlined and smaller than the female. Further, the anal and posterior dorsal fins are darker edged and more colourful than those of the female.

M. maccullochi attains a little over half the size of the preceding species and is, in most eyes, the more desirable species to go in for. This because it is smaller in build and does not look out of place in the average community aquarium. And, habitually, it is more handsomely marked. The back is brown, the underparts white suffused with yellow. Red to red-brown stripes adorn the sides. There are blue areas above and below. The scales discernible between the coloured stripes have shifting tints reminiscent of the luminescence of seed pearls. As in the larger *M. nigrans*, a splash of red is present on the iridescent gill-cover. It breeds like *M. nigrans*.

M. fluviatilis differs from the above two species in quite a few respects. For one thing, it reaches a length of about 5 in. For another thing, the sides in outline are somewhat elongated diamond-shaped. However that may be, they taper away quite abruptly to a small head and narrow caudal peduncle. The coloration is silvery overlaid with a pinkish to violet sheen. There are some irregular reddish stripes and the fins are markedly streaked and flushed with pink. As added attraction, the male has conspicuous black margins to his dorsal and anal fins.

In the main the silversides or atherines are littoral fishes which swim in shoals and are ensnared in their thousands for human consumption. I have seen it stated that atherines should be included, gastronomically speaking, of course, among the fishes collectively known as whitebait (delectable slivers of shining silver, which turn golden brown and crisp after being tossed in a pan of very hot beef-fat). This opinion, from whatever source, should not be taken seriously. For as long ago as 1877, Aeneas Dallas Sweetland, a forgotten author who was responsible for that remarkably erudite and rare cook-book entitled *Kettner's Book of the Table*, placed on record that " . . . whitebait have never been found with roe; and therefore they must be young." That being made clear, this fugitive scholar of the culinary art goes on to declare without, unfortunately, giving the source of his information, that " . . . they are infant progeny of the common herring, with all the manners of the parent fish save this—that they travel up the Thames to haunts which their ancestors, if ever they were there, no longer seem to approve of."

That whitebait are not infant or adult members of the family Atherinidae is borne out by Alan Davidson, the knowledgeable author of *Mediterranean Seafood*, published by Penguin Books as recently as 1972. Mr. Davidson writes: "Whitebait are very small sprats and herrings in the first years of their lives."

There are several genera of the family Atherinidae and they are distributed in various parts of the tropical, sub-tropical and temperate world. They are characterised by two dorsal fins, the first short and spiny and placed about the middle of the back and the second, entirely separated from the first, which ribbons back towards the tail. The top of the head is depressed. There are small teeth in the jaws. The mouth is transverse.

As far as I can make out, few atherines have foresaken salt or brackish water for a freshwater habitat. Those that have are all confined to the Tropics (though someone may know better), with the exception of *M. nigrans*, of course, which, as mentioned above, has a wider geographical range.

Not so many years ago, a new rainbow fish or atherine appeared on the market. This species, formally known as *Bedotia geayi*, is native to Malagasy. Popularly called the Madagascar rainbow fish, this species ranges in the wild state from sea-level freshwaters up to 2,500 feet, in mountain streams. It attains a length of about 3 in. and is not much of a problem to keep and breed in very clear and well-aerated water. An atherine with a much longer history as an aquarium inmate is the Celebes rainbow fish or *Telmatherina ladigesi*. This fish also reaches about 3 in. and, in the male, is remarkable for the extensions to the rays of the second dorsal and anal fins. It is a perfect gem in coloration: blue along the middle of the almost translucent olive flanks and vibrant yellow on and about the underparts. The first prolonged rays of the fins are black, the membranes yellow. The lobes of the forked caudal fin are yellow in the base and blue at the tips.

WHAT IS YOUR OPINION?

by B. Whiteside, B.A.

Photographs by the Author

Billy Whiteside resides in County Antrim where he is a housemaster and teacher of English. He has been keeping fish for 25 years since he was seven years old. "Spricks" or sticklebacks, and tadpoles were his first aquarium charges with a pair of goldfish marking the transition to tropicals. Billy now runs six tropical tanks from which he derives great pleasure but he is not interested in showing fish. "If they breed, I'm pleased but if they don't I'm not disappointed," he says and confesses that he would rather give young fishes away than sell them. He encourages the setting up of aquaria in schools and hospitals.

The idea of "What is Your Opinion?" came to him in 1967 while scanning the "sob" page of a woman's magazine in a dentist's waiting room. May of that year saw the first appearance of the feature which Billy then hoped might last a few months!

I WOULD LIKE to begin this month's Golden Jubilee feature by paying a few words of tribute to our Editor, Mr. Laurence E. Perkins. Although Mr. Perkins stays very much in the background he is largely responsible for the increasing success of our magazine over the past few years, resulting in its now being the aquatic magazine with the largest circulation in Great Britain. I would like to pay also a few words of tribute to Mr. John E. Young, our Advertisement Manager, for his contribution to the success of our magazine. His ability to attract so many advertisers helps to keep down the cost of the magazine to the reader—and I must admit that, like many other readers, I enjoy reading, and obtain a lot on interesting and useful information from, the advertisements in the magazine. I would like to extend my tribute to the many people who have written to my feature over the years. Without your letters this feature could not continue. I hope that you will all continue to write to me—even though postage rates have risen yet again.

Mr. C. Greenman (July edition) asked for information about de-rusting angle iron tanks. His request brought the following reply from Mr. D. Kettle, of 4 Flamborough Road, Ruislip Manor, Middlesex. "To start with, any paint that contains metals like zinc is equally corrosive as chemical reaction of oxygen and water turns metals into oxides and can be toxic to fish whether they be freshwater or marine. The metal scare is quite justifiable when it comes to keeping fish in contact with metals—including alloys. I suggest waterproofing with 'Pondamarine' as I am in the process of making preparations to build up a stand tailor-made to suit my requirements, which will include a freshwater and a marine tank of about 5 ft. in length; and I shall ensure waterproofing of every scrap of metal parts, including spring tube clips, nuts, bolts, etc. In Mr. Greenman's case he could either strip his tank down, removing paint and glass, and paint with 'Pondamarine' from scratch; or paint with this stuff providing he has ensured he has painted in any gaps thoroughly, without stripping off the glass. The only snag, though, is that the quantity the distributors supply is rather large for the amount Mr. Greenman requires. If he would like to contact me I may have some left over for him to do his job when I have assembled my construction. It would be a good idea if the manufacturers could supply dealers with smaller quantities to sell to hobbyists for small jobs.

"I would like to see some articles devoted to foods for marine fishes and invertebrates. For example, what is plankton—all types? What are their shapes,

how are they formed, and what makes them the life force for any marine animal? Can they be obtained artificially? Showing diagrams would clarify quite a lot. P.S. 'Pondamarine' is supplied by City Pets, Lower Friar Street, Newcastle upon Tyne, and is available in a range of colours." (If the manufacturers of 'Pondamarine' consider that their product would be suitable for waterproofing angle iron aquarium frames, and that it would not affect plant or animal life, might they give serious consideration to making it available to hobbyists in smaller quantities? I'm sure many of us would be interested in such a product. Perhaps Mr. Kettle would care to ask them, if he knows their address? Plankton is the name given to the masses of minute plant and animal life found drifting in large areas of water such as seas and lakes. The last time I had a look at living plankton, under the microscope, was some years ago at the Queen's University Marine Biology Station. If I remember correctly, the plankton I investigated contained minute plants of *algae* (seaweed), and newly hatched specimens of such creatures as sea urchins, jelly fish, etc. I doubt very much if they could "be obtained artificially" for feeding to inhabitants of marine aquaria; but I am open to correction as I have not yet kept a tropical marine aquarium. However, in the past I have purchased from the Liquifry Co., a food called 'Biol'. It is 'dried plankton culture' and the makers claim that it 'replaces live food.' Any left uneaten will form natural *infusoria*. I have used it to feed baby fishes as it has a very high protein content —70%. I don't know of any other dried fish food with such a high protein content.)

The subject of biological filtration in aquaria is one which crops up regularly in this feature. The following information, entitled "Notes on Biological Filtration in the Aquarium," was supplied by Dr. J. Neville Carrington, of Interpet. The notes formed the basis of a lecture given by Dr. Carrington to a group of fisheries officers who visited Interpet. My thanks go to Dr. Carrington for allowing me to make use of his lecture notes. He writes: "This term (biological filtration) is applied to filtration systems wherein the waste products from the fish are broken down biologically within the confines of the aquarium and its associated equipment. Similar processes are used in sewage farming and water purification industries and a search of this literature can provide the detailed technological background. The essence of the process is to utilise the natural bacterial population to oxidise the waste to simple chemical combinations such as nitrates. To carry out this process effectively three factors must be provided for: (a) A suitable medium must be provided in which the bacterial population can flourish. (b) Adequate oxygen must be available so that the bacterial oxidation process can take place without depleting the aquarium water. (c) Circulation is necessary to bring the waste material to the filter bed and to provide a constant supply of oxygen-rich water to the filtration bed. The *waste material* to be treated can vary considerably in its composition. The excreta from freshwater fish generally is fairly solid in its composition, as compared with marine fishes which tend to dispose of waste products in a more liquid form. This provides an immediate problem. Breakdown of the waste can produce ammoniacal products which have to be oxidised to form nitrates in simplified form:

Urea ——→ Ammonia ——→ Nitrate
($NH_2CO\ NH_2$) (NH_3) (NO_3)

No self-respecting chemist would present an equation like this!

"Ammonia is highly toxic to fish and has to be oxidised to relatively harmless nitrates as quickly as possible. When the waste is solid (e.g., freshwater fish), then the breakdown occurs slowly enough for the biological systems in the aquarium to cope with the oxidation process. However, in marine aquariums, if the oxygen potential is not very high, then the ammoniacal substances can be produced more quickly than they are oxidised to nitrates. A small build up in ammonia can lead to lethal conditions in the aquarium. This problem can be overcome by the use of an ozoniser. Ozonisers have one further use. If there is any putrifying matter in an aquarium, then the bacterial population can increase very quickly. This can rapidly use up all the oxygen, at the same time producing toxins so that the fish can be suffocated and poisoned at the same time! Use of an ozoniser on a continuous basis can prevent this situation which can occur in freshwater aquariums due mainly to overfeeding, but in marine aquariums due to the death of a fish or more seriously an invertebrate such as an anemone. For the reasons given above I believe that ozonisers should be used more often commercially than is current practice.

"The *filtration medium* ideally is porous to give opportunity for a big surface area of bacterial patina to react with the water which is circulating past it. Research has been carried out to show that oolitic coral is much more effective than crushed shell for instance, due to the porosity of the coral. The choice of the filtration medium therefore depends upon the degree of effectiveness required. Porous carbon particles are also excellent as a filtration medium. In marine tanks oolitic coral is the ideal medium since it has the porosity and also acts as a natual maintainer of the p.H. In freshwater tanks the rapidity of action is not so important and gravel is satisfactory. For more action a bed of carbon can be used. However, it is important that the interstitial spaces between the particles are not so large that debris can get trapped in them to go bad. It will be noted that sewage farms use a bed such as coke or clinker to give adequate surface area for bacterial reaction.

"*Oxygen* has to be provided by circulation of oxygen-rich water. This involves adequate aeration which can be helped by releasing air bubbles in the airlift connected to the biological filter. *Circulation* is affected by the design of the filter bed. The two ways of providing a biological system are: (1) Lay the filter medium on top of a perforated plate on the base of the aquarium. This plate may consist of a sheet of corrugated P.V.C. with saw cuts at intervals of, say, 1-2 in. and should have an airlift tube of, say, 1-1½ in. diameter in a suitable position. An air release stone is placed towards the bottom of the airlift tube which should discharge at about water level. The filter bed should be 1½-3 in. deep. (2) Circulation can be provided through some form of box filter exterior to the aquarium. In some circumstances this can be an advantage since the filter can be cleaned without disturbing the whole set-up.

"For new ideas I suggest that you examine the literature from Water Purification and Sewage Farm Engineering (*sic*). There are many books with information on biological filtration but no one book that I know of gives all the details I have summarised above. I suggest you examine the references: 'Fish and Invertebrate Culture' by Stephen Spotte and 'Marine Aquarium Keeping,' both published by Wiley Interscience." (I'm sure that Dr. Carrington's lecture notes will provide us all with something new about which to think—even though some of us will still question the use of undergravel filtration in planted, freshwater aquaria. I consider that one of the main errors made by those who unsuccessfully use U/G filtration is their use of an insufficient depth of gravel for efficient functioning. In many such cases waste materials are drawn down into the gravel —and immediately sucked into the plastic body of the filter and blown out via the outlet back into the water. Naturally this could only occur with certain brands of filter and with very fine particles of sediment.)

It makes a pleasant change to be able to include a letter from a young lady. The young lady in question is Miss Ann Walker, whose home is at 10 Blunesfield, Potters Bar, Herts., EN6 5DG, and she writes: "My friend Mr. G. Millman and I would like you to announce, with your permission, the formation of a new club for aquarists of our age group—14-19. The club is the A.P.S.—Aquatic Penfriends Society—and its aim is to form a society of young aquarists, each one specialising in one or more subjects of the hobby, and, hence, to form a team of experts dotted all over the British Isles. Anybody interested should contact either me at the above address, or Graham whose address is 101 Loushers Lane, Warrington, Cheshire, WA4 2RF. All enquiries should be accompanied by a s.a.e."

The next letter, which crossed the world to reach me, comes from Mr. H. Moran, of 164 Victoria Street, Dargaville, New Zealand. He writes: "Although in early middle age I am a newcomer to the hobby, having bought my first tank and tropical fish only two months ago. I have been interested in fish for a number of years but the opportunity to start a tank did not come until this year. . . In a smaller tank I have a number of guppies and a swordtail. The latter is about 2½ in. long and was bought as a female about five weeks ago. It showed all the characteristics of a female then but since then it has developed a sword which is about ½ in. long. It also has a gonopodium. Is this development usual in this size of fish? It was

one of two swordtails in the tank; the other one was definitely a male." (It sounds as if the fish was just a late developer.) Mr. Moran continues: ". . . When I first set up the large tank I fitted an internal filter which used as a filtering device a piece of foam plastic of about 3 in. long and 1½ in. in diameter. This filter was stuck on to the side of the tank just above the gravel. Ordinary tap water was used in the tank and was allowed to stand in the tank for a few days with all systems on before the fish were put in. The water tested showed a p.H. of 7·4. The fish were then bought from a local dealer. Within the first two weeks I lost about eight fish of various sorts. The plastic foam of the filter was removed and washed out twice this time. The second time I removed the foam and washed it, it started to disintegrate slightly. I was then able to squeeze in into a lump about the size of a marble. As I did not have a replacement I then left the tank without a filtering element for about ten days, during which time I did not lose any fish. After this time I spoke to the dealer about it and was given another improved type of plastic foam element. This was fitted to the filter and remained in the tank about a week, during which time I lost another four or five fish. I removed the filter and the tank then remained without a filter until about a week ago when I fitted a U/G/ filter. During the two periods the tank remained without the filter I did not lose any fish. The tank was well planted and the temperature was 70-75°F. I have since spoken to a number of dealers and importers about this problem. They have all told me that they use the plastic foam filters in their quarantine tanks and have never had any trouble. However, to my mind it seems more than just coincidence that I suffered losses when the filter was working and no losses when it wasn't. The water in the tank remained clear and about a third of it was changed each week.

"The number of fish in the tank at any one time during this period would not have exceeded thirty-five and they were all small; the four angels were the largest, being about 1½ in. at the time. There was no difference in the feeding pattern from that I adopted when I began in the hobby. This is as recommended in the many books I have read on the subject. I would appreciate any suggested causes, for these losses, that you or your readers might be able to offer. Also, I would welcome any letters, written direct to me, that would help in my new hobby. I forgot to mention that all dealers spoken to had experienced the disintegration of the foam without the ill effects. The fish keeping hobby seems to be growing very fast here in New Zealand as more dealers appear on the scene. In Auckland, the biggest city in this country, there were as many dealers as could be counted on the fingers of one hand two years ago; but now there are probably about six or eight times as many. In the small town in which I live, during the past two months I have heard of a number of people who have started in the hobby. We do not yet have a dealer in this town although the woman from whom I purchase most of my fish sells from her home. One of our local electrical dealers told me recently, when I tried to buy a light for my tank, that I was the fourth person to inquire in two days for light fittings for fish tanks. This indicates that the hobby is growing quite fast here, for the benefit of all, despite government regulations prohibiting the sale of many types of goods, including fish or other pets, over the week-ends. Hoping to hear, through your column or direct from your readers, the answer to my problem." (It would sound as if your filter foam pads were to blame for the deaths in your 24 in. × 15 in. × 12 in. tank. Possibly the filter foam pads did not affect fishes in dealers' and importers' tanks because such quarantine tanks were probably larger than your tank and, hence, any toxic substance released would have been more diluted. It could also be said that your tank contained rather a large number of fishes for its size. Also, weekly water changes of one third should be unnecessary—and indeed could be harmful under certain circumstances. However, neither of the latter suggestions would account for the fact that no fishes died when the filter foam was removed—hence I would conclude that it was at fault whatever the dealers and importers found in their own tanks. If none of your fishes is now dying you should scrap the filter foam. What are readers' opinions?)

I'm pleased to be able to include a letter from another young lady this month. It comes from Miss Josephine Fox, whose home is at 6 Wellington Esplanade, Lowestoft, Suffolk. She has the following opinions to express: "I only discovered your excellent articles when I discovered *The Aquarist* early this year. Since becoming a regular reader I have found W.Y.O.? to be consistently interesting and informative. So many things, I have come to the conclusion, are really a matter of opinion and no hard and fast rules apply to anything—a bit like bringing up children, really! I was most interested in this month's (July) edition to read of Mr. P. Jones's difficulties with growing plants in his tank. I have had a 24 in. cold water tank since last spring and have re-stocked it several times with a variety of plants—several pounds' worth in fact—and they have all died off at various intervals. At first I blamed this on the *algae* which seemed to proliferate on the leaves and glass. I wrote to Mr. Boarder, who was very helpful, and as a result reduced the 25 and 40 watt bulbs to two × 15 watt bulbs, which had a dramatic effect on the quantity of *algae*—and also on the plants as they now die off even more quickly! The growth of fishes being as insidious as it is, I had also failed to realise that the three goldfish (bequeathed to me by my nephew after he had won

them at a fair whilst he was on holiday with me) and the two golden orfes—no don't laugh, they were only 1¼ in. long when I bought them and the shop-keeper did not tell me what size they would normally reach!—had each attained a massive 4-5 in. and were far too brutal for the plants I was trying to cultivate. The fish now reside in my brother's garden pond, which is more suited to their size, and I now have two fantails, a stunted golden orfe—which lost its gill plate when small and never seemed to grow—and a small green tench. However, still the plants won't grow; and now, after reading your column, I have found another reason, perhaps, why they won't grow.

"When the goldfish were getting big and I was too inexperienced to know better, they were stirring up the bottom and seemed to be making the tank awfully dirty with droppings, etc.—the etc. possibly being too much food?—so I put in an extra filter, thus making two: a bottom entry filter and a conventional top entry filter. Being a person of great habit, I had failed to remove these when the other fishes were tranferred. Now, of course, your comment that many tanks are kept too clean for plants to grow seems very valid and I shall rectify the matter forthwith. Perhaps I may let you know later if the remedy works?" (I'd certainly be delighted to learn if the 'remedy' works.)

In the July edition I made some provocative comments about the News from Societies section of the magazine in the hope that it would provoke some reaction from readers. It did. Mr. G. Hall, of 16 Morrell Crescent, Littlemore, Oxford, is the secretary of Abingdon Aquarist Society. He writes: ". . . I wonder if I could put my view as one of the society secretaries who send in these reports? I think, perhaps, there are two reasons why we use these columns. Firstly, they are a means of gaining and imparting new ideas for club activities and (of gaining) other people's impressions of a speaker's quality before we hire him. Secondly, they provide an excellent form of advertisement when people are looking for a club in their area. For the people who don't enjoy club life, and judging by club attendances compared with the number of people who keep fish this number must be quite high, I would agree that this is probably a section that could be better employed for other things. One solution to this problem, that might satisfy both types if this is ever possible, would be to publish club news in its present form every four months; and for the other months to publish a club directory giving names, meeting places and times, and the secretaries' addresses. This would take up much less space than is used at present and would allow for more fishy details and the like." (Some such compromise could well help to keep both 'camps' happy.)

Another interesting letter on the same subject comes from the secretary of Wrexham Tropical Fish Society, Mr. E. Jones, of 2 Parkfield, Gresford Park, Gresford, Nr. Wrexham. He states: "Our society, which is a relatively small one but reasonably successful, finds the society news and reports' section of this magazine both of assistance and interest. Located as we are 'off the beaten track' as it were of the main conurbation of societies, we find it difficult/impossible to have visiting lecturers due to the distances involved, and therefore we are of necessity inclined to be more of a 'do it yourself' society. By this I mean that to keep the society going it is necessary for our hard-working committee members to do some lecturing as well as organising the usual quizes, etc.; and they are more than willing, thank goodness, to read up and talk on most subjects. It is from the point of view of getting new ideas and subjects to talk about that the reports are

of great interest to us. We learn what is going on at other societies and we would be very sad to see this section of the magazine disappearing.

"Regarding your comments about 'pot hunters'—I cannot agree with these views. These people are all part of the aquatic scene; these open show winners are those who progress to provide us with the marvellous spectacles at the big national shows, and I'm sure you wouldn't disagree with me that it would be very regrettable if these highlights of the aquarists' year should discontinue. While I would be (only slightly) inclined to agree that the long list of winners should go, if the mere fact that the names do appear in the magazine could be an incentive for people to keep showing, and could induce more people to show their fish, then on balance I would say, 'publish and be damned.' After all, nobody is forced to read through these results; however, if the omission of these lists would mean more space for W.Y.O.? etc. then . . . As you say, this is publicity for the societies—and it can't be bad. I would add that it was through the News from Societies' column that I first got to know of the existence of our local society, and I'm pleased that I took the trouble to go along. It has always puzzled me why, when our hobby is gaining in popularity, the societies—at least in our surrounding area—are generally finding difficulty in keeping going, with declining membership. I have read somewhere that a large percentage of new aquarists fall by the wayside about six months after starting. Could it be that they find problems that they are unable to cope with? If so, had they been members of a society the experience available from fellow members could have been just the thing to keep them going through this initial period. Simple yet very common errors, such as having shells and coral in a freshwater tank, and the subsequent and inevitable deaths due to the water becoming progressively harder, would be avoided . . ."

Photograph 2 shows *Haplochromis multicolor* (*strigigena*), the small or Egyptian mouth-brooder. Please send me details of your breeding experiences with this species. Under the cardinal tetra, in photograph 2, can be seen some specimens of *Thiara tuberculata*, the Malayan live bearing snail. I consider this species to be the most useful and least harmful snail that can be kept in a tropical aquarium. Mine are excellent scavengers and never destroy plants. would you agree that this is the best snail for tropical conditions—assuming that one wishes to keep snails in a decorative aquarium? Under what conditions have you successfully cultivated spatterdocks? I would like to receive your suggestions for a collection of plants suitable for a 24 in. aquarium—either cold water or tropical. What selection of fishes would you choose for a 24 in. community aquarium? I hope you have enjoyed this Golden Jubilee W.Y.O.? and I look forward to receiving your opinions for a future issue. Please PRINT your name and address on letters and add the date. Send them to me c/o 'The Aquarist and Pondkeeper', The Butts, Half Acre, Brentford, Middlesex TW8 8BN. If your letter requires a reply you *must* enclose a s.a.e. Goodbye until next month.

THE FIRST MIDLAND AQUATIC FESTIVAL

Report by Kym Cooper

SATURDAY, THE 10TH OF AUGUST dawned, bringing with it the first day of preparation for our new venture. Scaffolding and our intrepid show committee members arrived bright and early. The main object of today was to erect stands for the coldwater classes, which in spite of the change in show format, were still retaining their old identity.

A few days of preparation followed, during which the traders' stands were set up and the ten competitive society tableaux gradually took shape. Ours was a

representation of the Severn Bridge, containing the exhibits on the "road" and the "river" was full of goldfish, which when the children arrived, was gleefully investigated.

The North Warwicks Aquatic Society also had the children in mind. Their "nursery" had tanks set into large building bricks, and slogans inviting the kids to "Grow up with the N.W.A.S." and to bring dad as well.

As our festival coincided with the tenth anniversary of the South Staffs Aquatic Society, they made a "cake" to celebrate. Tanks were set into the "table" on which the cake was laid.

Shakespeare provided the theme for the Fancy Guppy Association, with "All the World's a Stage" being their subject, and Guppies were the stars of the show. This also provided a goodly amount of entries for Class 35.

The Midland Tropical Aquarists had brought a show of their own, in the shape of a "Big Top," filled with fish. Animals and clowns' faces were painted on the outside, and balloons and streamers hung from the top.

The Delson Aquatic Society felt they should keep to the waterways of Great Britain, as their entry was a canal barge, made to look realistic by the use of dark brown hessian.

The Lucas Aquatic Society had yet another well-designed stand, with an accent on the world of pop music, as their entry comprised a drum kit and piano with tanks contained in each. Pop posters festooned around completed the picture.

The B.M.A.A. (Marines) stand was a large, strikingly colourful fish on a dark background, with two decorative tanks set in to the fish's body.

The British Killiefish Association, led by old hand Bill Devison, put up a stand resembling a greenhouse, with tanks containing many different varieties of killies in the front face of the construction.

The International Herpetological Society erected a stand to show different varieties of reptiles and amphibia that can be found in Africa. The I.H.S. had a rather large corner of the hall for their own competitive show, their largest entrant being a 17-foot long Python (Monty?), which, needless to say, took first place in its class.

Also in the snake line, there was a trader who dealt in reptiles and amphibia, and a few oddities besides! Among the "beasts" on show were rather large, squashy-looking toads with big eyes, giant millipedes, and a couple of scorpions (just the thing to find in your bed on a hot night!).

There was a pleasing display of Koi Carp by a breeder from Cornwall. The general public found these gentle, colourful fish interesting, and he had plenty of inquiries.

The show was opened by "New Faces" star Anne Beverly at 2 p.m. on Thursday, the 15th of August, a day later than usual. After the official ceremony, she was introduced to some of the exhibits by our show secretary, John Witts.

The Coldwater exhibits were of a high standard this year, with the larger part of the entries being contributed by Messrs. Frank Close, Tony Roberts and Tommy Sutton, three of our most devoted members. Tony took Best in Show with one of his magnificent Veiltails. As usual, M.A.P.S. retained their lead over Bristol A.S. in their never-ending battle over the competitive Coldwater Trophy for these two Societies. Entries were not as many as in previous years, but all the quality was still there.

Best Fish in the Tropical Section was a Flying Fox owned by a member of the M.T.A. Largest Entrant was an *Osphronemus* gourami, which was about 16 inches long. There was a large variety of tropical entrants this year, although tableau size restricted number of entries. Few losses were incurred this year, as fish were restricted inside the tableaux.

The Competitive Society Tableaux were judged as follows: First, the M.T.A.'s "Big Top," second was the F.G.A.'s "All the World's a Stage," third was the Lucas "Pop Group," and fourth was our own stand, the "Severn Bridge." The M.T.A. also took the Tropical Points Trophy. A good week in all for them.

Our four traders reported good business for the three days of the show. The presentations took place on the Saturday evening, with our three coldwater friends taking the glut of the coldwater trophies (Frank, Tony and Tommy that is), these three gentlemen, along with one or two others, were presented with the Appreciation Trophy for the greatest service to the Fishkeeping Hobby, for co-writing a book on Coldwater Show Standards.

A surprise presentation took place at the end to our secretary, Graham Elvis, in the form of a wedding present. We wish him and his future wife all the best for the future.

So, on Saturday night, the Bingley Hall Show closed down yet again. Not as last year, our 30th anniversary of the Midland Open Show, but the end of the first year as the Midland Aquatic Festival. There was a greatly increased gate from last year and a few years previously, and a colourful turnout from nine other societies.

Finally, I would like to close by wishing our show secretary's feet a speedy recovery, and by thanking all competing societies, coldwater exhibitors, the staff at Bingley Hall, club and committee members alike, and the pub over the road which was used as a "Sup-committee meeting place" for the duration of the show, and anyone else I may have inadvertently forgotten. Thank you once again all of you; without your help this show would not have been possible. I hope to see everyone who was here this year, plus a few more, next year.

OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE
All queries MUST be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

COLDWATER QUERIES

by Arthur Boarder

Arthur Boarder had his first fish tank when he was five years of age in 1900 and as his father was a keen angler he grew up in an atmosphere coloured by fishy talk in which his brother joined for he was a keen aquarist. Arthur kept tropicals for a number of years but gave them up in 1937 to devote all his time to the breeding of a strain of red-scaled fantails.

In 1946 he started writing features for the *Aquarist & Pondkeeper* and later became responsible for answering the Coldwater Queries. He exhibited his fish successfully until 1950 and then started judging. He still breeds his well-known fantails but has given up judging and lecturing. His only break from the fish-keeping hobby occurred between August of 1914 and October, 1919 during war service.

Could you please tell me where I can get a pair of food-grinding plates?

These are known as Worm Shredders and were made and sold originally by a Mr. Walker. When he died the plates were unobtainable. Two or three years ago I lent a pair to a dealer so that they could be copied and marketed. They have never been returned and not even acknowledged. I remember seeing an advert. for them in *The Aquarist* some time ago and think that it may have been in the small adverts. section Look back through your old copies and you may come across the mention.

I have had three goldfish which were suffering from fungus disease in a sea salt solution for some days. All except one appear to be cured. How long can goldfish be kept in the salt solution and if it is good for them can they be kept continuously in such a solution?

When fish show signs of recovering in the salt solution it is advisable to gradually decrease the strength of the solution to get the fish back to normal. If a fish does not respond to the treatment the solution can be strengthened to double the value, but not all at once. Although some salt in the fish water may not be a bad idea, it is not advisable to keep goldfish in salt water for too long. Also, even salt water can turn foul and so it is a good plan to examine the water for bad smells every day and change to a fresh mixture if it is foul.

We have two goldfish in an 18 in. × 12 in. tank and both have white tubercles on their gill-plates. We thought that they were male and female but they chase each other round the tank vigorously and the duck weed on the surface ends up on the wall. Can you throw some light on the subject?

Although it is usual for the male only to have white tubercles on the gill plates, it has been said that now and then a female fish will also show them. I have never seen this myself but it may be true. On the

other hand you may have two males and if in good condition could chase each other. If it is always the same fish which does the chasing then it can be assumed that the other is a female, but if they chase each other in turn I suspect that you have two males. An experienced aquarist could hold a fish, belly up, and give slight pressure towards the vent. If a male fish in breeding condition, a little milky fluid could be extruded. Only slight pressure has to be used or damage could be caused to the fish.

In less than two weeks all the goldfish in my friend's pond have died and all the water plants are covered with a brown matter and are dying. What can be the cause?

From the description of the trouble it can be assumed that the water has become badly polluted. Once something decays in the water it starts to go foul, then if nothing is done the water soon becomes badly polluted and the fish and plants would soon die. It is not possible to say what the cause was but in so many similar cases it is because too much food has been given. I will say without fear of contradiction that most cases of water pollution in garden ponds are caused by the owner giving the fish more dried food than can be cleared up that day. It does not matter what type of dried food is used, if it is allowed to remain in the water for a couple of days or so, it will start to go bad. Then the fish will not eat it and trouble follows. I am often telling pondkeepers to go easy with the dried foods. There should always be something for the fish to eat in a properly set-up pond with growing water plants. It only needs one day's over-feeding to upset the fish, but of course the size of the pond can make a lot of difference. The smaller the pond the more easy it is to become polluted. Any pond with foul water should he cleaned out and a fresh start made, and for goodness sake do not start piling in dried food as soon as the fish are replaced in the pond. Two or three pellets or a small pinch of dried food is all that should be offered and if this is not taken within three minutes, no more should be given that day, and average feeding should not start until the first bits *are* taken.

I have had some goldfish die with sores on their bodies which have turned bad with fungus. Why is this and also why does the water turn green? I have a liner in the pond and would like to know if a concrete pond would have the water turn green as well?

It is impossible for me to say what has caused the sores on the goldfish. There are several reasons for this and I think that you will have to make some examinations of the fish to try to trace the culprits. There are several pests which can make the sores. Small ones are made by fish lice, *Argulus*, and Anchor worm, *Lernaea*. The former can be seen as small flat jelly-like pests sticking to a fish, sometimes almost hidden at the join of a fin to the body. These are about an eighth of an inch across. Anchor worms can be seen as dark threads sticking out from the body of a fish and these have claw-like appendages with which they hold on to the fish. There could also be free swimming pests which could cause the damage. These are dragon-fly *larvae*, water beetle *larvae*, and the beetles; water boatmen, *Notonecta*, and leeches. It may also be that there are some frog or toad tadpoles in the pond. Although most frog tadpoles could be eaten by the fish before they could grow large enough to do any damage, toad tadpoles are not eaten once they get just about half grown. I have known tadpoles attach themselves to a goldfish and gradually gnaw away much of the mucus covering. This is when the tadpoles are fully grown and when they can swim too fast for a goldfish to catch. If some of the mucus covering is destroyed then the fish is prone to attacks of fungus disease. Go to the pond at night with a torch and you may find the culprits at the surface when they can be netted. Water would also turn green in a concrete pond.

I have a garden pond which is irregular in shape and would like you to recommend a pond fountain, waterfall and filter for it please.

In the first place a filter should not be necessary in a garden pond which is properly planted, unless it is intended to keep Koi alone. Although I know that Koi-keepers recommend that a filter is necessary, I know many pondkeepers who keep Koi with other fishes in a pond and have no filter. As for recommending the fountain and waterfall, I think that the best idea for you will be to get a catalogue from the address I shall enclose. This will give you all the information you want so that you can choose the appliances which best suit your pond and your pocket.

I have a garden pond 11 × 7 ft. and 18 in. deep with plants, freshwater shrimps and *Daphnia*, also there are 4 orfe, 2 golden rudd, 2 roach and 14 goldfish, various sizes. I have had some of the goldfish with fin-rot and fungus and when examined I have seen small striped leech-like worms attached to their bodies. What are they and what can I do to clear them?

I am amazed to learn that your pond contains water shrimps and *Daphnia* with so many fishes as well. I would have thought that no *Daphnia* or shrimps could survive for long in any pond with the number and types of fishes you have. The trouble is that the fish are attacked by leeches. There are several species of these and they all have a sucker with which they attach themselves to a fish and feed from it. If you can catch the goldfish and remove any leeches seen this will help and you can place some flat stones or pieces of slate, etc., on the bottom of the pond. If these are examined each morning it is probable that leeches will be found underneath.

I have just read your remarks about golden orfe not spawning in a small pond. I have a pond 9 ft. by 6 and my 10 to 12-inch orfe spawned on the 20th May this year.

Strangely enough, an aquarist friend who lives near me told me that his orfe were spawning on 14th May, and I went round and saw them. His pond is about 10 ft. by 8 ft. and has a fair amount of water plant life. The orfe spawned round the roots and stems of a water rush.

It was good of you to write in and I wish that others who have something interesting happening would also write in about it as if not, how am I expected to know what can and does happen in readers' ponds?

I recently bought two goldfish. One has stayed gold and the other is turning white. Can you explain this?

The fish may not be suffering from any disease but its colour pigment is changing. If the fish is healthy and feeding and shows no white slime or woolly substance on it, then it is a normal change to silver. Many goldfish become partly or wholly silver if there was such a fish among the parentage. Many goldfish are gold and silver and often the silver will increase in size each year. It is not often that a fish with silver makings will lose them and turn to an all-gold fish.

TROPICAL QUERIES

by Jack Hems

I bought some curly-leaved Elodea for my tropical tank but after a few weeks it turned yellowish and rotted away. Yet the *Elodea* (*Egeria*) *densa* I bought at the same time is flourishing well. Please can you tell me what caused the other plant to die away?

The curly- or reflexed-leaved Elodea, the proper name of which is *Lagarosiphon muscoides*, is not suited to the heated aquarium. It will only grow in a well-lighted coldwater aquarium or outside pool.

My aquarium is plagued with filamentous *algae* which is choking the several plants I have ranged along the rear glass of the tank and bunched at both ends. What can I do to halt the growth of this *algae*?

Wind as much of this *algae* as you can on to the end of a notched cane and pull it out of the aquarium. Then introduce a lot more higher plants. In short, fill up most of the floor space, apart from a swimming space along the front, with underwater vegetation. As the new plants make headway they will rob the *algae* of food and light and it will become less troublesome. Indeed, it is quite likely that it will vanish altogether.

Can you please give me the names of a few community cichlids not addicted to eating or chewing at the plant life?

Go in for the various breeds of angel fish, *Aequidens maroni*, and the dwarf cichlids such as kribensis, *Apistogramma wickleri*, and the like.

What use are the feeler-like fins to gouramis?

As we are not able to hold a conversation with species of *Colisa* and *Trichogaster*, we can only base an answer to your question on personal observations. These appear to indicate that the thread-like pelvic fins are used in display, in discovering passageways through tangles of plants, and in deriving some sexual stimulation through contact with the opposite sex during courtship.

I think Malayan angel fish one of the most attractive additions to a community tank. Could I introduce three or four young ones into my tank at present housing a small number of tetras and barbs?

Small Malayan angel fish will not harm other fishes, but as they grow very rapidly, if they are given the right conditions and care they will become rather bullying and passionately fond of eating the aquarium plants. If Malayan angel fish are to flourish really well then they require salty water and plenty of green food besides meat, the regular livefoods and dried foods. Hence the idea of keeping them in a well-planted tank filled with unsalted water is not a good one.

I have some plants of the beautiful Java fern (*Microsorium pteropus*) and some of the baby ferns which sprout from the mature leaves have emerged above the surface of the water. Unfortunately, instead of growing strong and green, they have turned blackish and shrivel away. Can you tell me why they do not continue to grow like the ferns they are above the water line?

Your toplight is drying the airspace between the water and the glass cover or hood. Again, in all probability the light is too strong. The aerial foliage of the Java fern requires a very moist atmosphere, and not too much bright light.

I would be grateful for some information on the breeding and rearing of the dwarf gourami. Does the female develop eggs irrespective of the

presence of a male, or does she fill up with eggs only after being courted? Furthermore, what special treatment do the fry require in order to grow them to a good size?

Plenty of food, a well-lighted aquarium, masses of plants at the surface and a high temperature will sometimes result in a female dwarf gourami filling up with eggs whether a male is present or not. As a rule, though, a temperature in the upper seventies (°F), good food, plants and the rest, combined with the presence of a flashy male, will trigger off the spawning procedure. The fry of the dwarf gourami are delicate little creatures and call for clear and unpolluted water and plenty of really microscopic live food. It is essential, too, to maintain a steady temperature and a film-free surface. Again, the cover glass must fit close, for after a few weeks swimming in all levels of the water, the fry rise every so often for a gulp of air. If the air they take in is on the cool side they die off in large numbers every day until only a few of the very strongest are left: perhaps a mere dozen out of a few hundred.

How can I remove leeches in my aquarium?

Every so often you can remove the leeches you see moving over the glass sides of your aquarium. All you will require is a razor-blade scraper to slide under them and a small net to catch them in. The others can be reduced in number by tying a thread to a piece of slate and lowering this to the bottom so that it settles down flat on the compost. In general, leeches avoid the light and retire, when not on the prowl, under stones. So, first thing every morning, pull the slate up and look underneath it. Another trick is to attach a small piece of well-soaked meat to a thread and lower this to the bottom. The leeches will be attracted to this bait and can be hauled up on the meat to the surface. If a leech is seen attached to a fish (though some species of leech are harmless), remove the fish from the water and dust the leech with a sprinkling of salt or a dab of TCP. This treatment will make it release its hold on the fish. If the leech has made a sore place, treat this with TCP or water down peroxide of hydrogen, and smear the wound with petroleum jelly before returning the fish to the water.

In an American booklet I have on the care of discus, various drugs are recommended for the cure of fungus and ulcers. These I have not been able to obtain over the counter of my local chemist's shop. How can I obtain these drugs over here?

A number of drugs sold under different brand names in America, and also over here, are only obtainable on the written authority of a doctor or veterinary surgeon. However, why go to the trouble of taking up a doctor's or vet's valuable time when such drugs—and even better ones—are marketed over here by a few dealers acting as agents for Continental firms? Our magazine, time and time again, has published the names of dealers handling such drugs. If you do not possess sufficient back numbers of this magazine to track a dealer down, then write in again and I will furnish you with the name of a few dealers.

I am desirous of collecting rainwater to top up my aquarium. Could you give me some tips which will prevent my introducing anything deterimental into the tank?

Firstly, if you live in a smoke-laden part of the country forget the whole thing. If you live in a smokeless zone, then it is a good plan to obtain a large plastic funnel. Insert this into the neck of a large bottle or carboy, and cover the bottom of the funnel, where it joins the neck, with a pad of filter fibres. This will stop airborne dust, debris and insects getting into the container. Stand the container outdoors where it will not get knocked over by four- or two-footed members of the household.

What is the lifespan of the tinfoil barb?

I couldn't say. It takes at least three years for a tinfoil barb to reach about the size of a herring—and much deeper than a herring between the dorsal fin and the belly—and thenceforward it appears to live for upward of about six or seven years.

Are weeds any good for the tropical aquarium?

Your question is not at all clear. If you mean weeds from your garden, then the short answer is, no. If you mean plants collected from your local still or fresh waters, then the answer is: very few native water plants will live long in the heated aquarium. And the few that will would have to be searched very thoroughly for leeches, snails and the egg-capsules of snails, various aquatic *larvae*, and the like, and then, after the removal of these creatures, the plants would need to be left to soak for a week or two in a pale pink solution of permanganate of potash to rid them of less noticeable pests.

I introduced some Malayan livebearing snails into my aquarium about a year ago and now I appear to have thousands. How can I reduce their numbers without having to take the tank down and setting it up again with new compost?

After a room has been in complete darkness for a while, many of the Malayan snails will leave the compost and crawl up the plants and the sides of the aquarium. Therefore, if you go into the darkened room with a torch or switch on the aquarium light, it is possible to net scores of the snails before the bulk of them vanish again under the compost. Repeat the performance every few weeks.

News from AQUARISTS' SOCIETIES

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

ENTRIES totalling 329 for the **Newport A.S.** annual open show showed an increase on last year's total. Best fish in the show was won by R. Onslow of Basingstoke. The King British Trophy for the most pointed Newport member was awarded to W. Gibbon. Results were as follows: Furnished Aquaria: 1, P. Jordan; 2, W. Gibbon; 3, J. Iliffe. Barbs: 1, Mrs. Cruickshank; 2, R. Onslow; 3, R. Beale. Characins: 1, Mr. and Mrs. Harding; 2, W. Gibbon; 3, C. Turner. H. H. and C.: 1, C. Turner; 2, H. Chick; 3, Mr. and Mrs. Dore. Cichlids: 1, R. Onslow; 2, D. Warmeant; 3, J. Egan. Angels: 1 and 2, R. Purdy; 3, P. S. Greenwood. Dwarf Cichlids: 1, D. Warmeant; 2, W. Gibbon; 3, J. Egan. Labyrinths: 1, Mr. Cripps; 2, D. Warmeant; 3, B. Purdy. Siamese Fighters: 1, Mr. and Mrs. Harding; 2, T. Cripps; 3, M. Collings. Egglaying Toothcarps: 1 and 2, G. Churchill; 3, C. E. Morrison. Tropical Catfish: 1, D. Lambourne; 2, M. Nethersall; 3, Mr. and Mrs. Gutherie. Corydoras and Brochis: 1 and 2, M. Nethersall; 3, R. Wigg. Rasboras: 1 and 2, R. Poots; 3, J. Egan. Danios and W.C.M.M.: 1, R. Onslow; 2, M. Guy; 3, C. Harding. Loaches: 1, P. G. Thomas; 2 and 3, W. Gibbon. A.O.S. Tropical Egglayer: 1, Mr. Cripps; 2, H. Chick; 3, J. Edwards. Sexed Pairs of Fish: 1, C. Turner; 2, C. Harding; 3, D. Warmeant. Guppy Male: 1, R. Purdy; 2, D. Richards; 3, P. Purdy. Guppy Female: 1 and 2, R. S. Wigg; 3, J. Edwards. Swordtail: 1 and 2, Mr. Aslet; 3, N. and C. Bowles. Platty: 1, Mr. Cripps; 2, P. Greenfield; 3, C. Turner. Molly: 1 and 2, G. Best; 3, Mrs. Guy. A.O.S. Livebearer: 1, B. Snell; 2, C. E. Morrison, 3, Mrs. Cruickshank. A.O.S. Coldwater Fish: 1, C. Rupert; 2, D. Warmeant; 3, B. Snell. Breeders (Egglayers): 1, D. Warmeant; 2, R. Rooms; 3, Mr. and Mrs. Harding. Breeders (Livebearers): 1 and 3, C. Turner; 2, C. Morrison. Junior Classes: A.V. Egglayer: 1, S. Bainton; 2 and 3, Carol Rupert. A.V. Livebearer: 1, J. Edwards; 2, N. and C. Bowles; 3, S. Morrison.

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MORE new members were welcomed at the August meeting of the **Association of Goldfish Breeders**. L. Clement gave an interesting talk on the filtration he used on marine fish and was now using on coldwater fish. Result of the monthly table show was: A.V.: 1, L. Clements; 2 and 3, I. Fleming. The secretary is G. Fleming, 3 Rutland Road, Wanstead, London, E.11.

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RESULTS of the third table show for the yearly trophy of the **Barry A.S.** were: 1, J. Webber; 2, M. C. Guthrie; 3, G. Ball; equal 4, M. C. Guthrie. The evening's entertainment was rounded off by D. Warmeant giving an excellent slide show. With one table show in the series left the positions are as follows: M. C. Guthrie 15 pts.; A. Wallace 6 pts.; J. Webber 5 pts.; K. Thomas 3 pts.; G. Ball 2 pts.

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AT the monthly meeting of the **Brighton and Southern A.S.** Miss Felicity Comber took her first trophy with a Pearl Danio. C. West (B Class, F.B.A.S.) judged the table show and then together with Peter Todd, from Hove Aquatics, gave an informal talk which was appreciated by all members. Any further information may be obtained from the secretary, S. Feek, 55 Newmarket Road, Brighton.

THE annual general meeting and autumn meeting of the **British Aquarist Study Society** (B.A.S.S.) will be held at the Zoological Society, London Zoo, on 5 October. A symposium on Anabantids will be held and the main speaker will be Professor McNeill Alexander. A panel of experts will answer questions on this subject during the second part of the meeting. B.A.S.S. will be happy to extend a welcome to any aquarist who wishes to attend this meeting and tickets are available from A. P. Keens, Highcliffe, Old Hill, Woking, Surrey. The tickets will cost £1 each and this cost will include tea.

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RECENT results of the **West of Scotland Exotic Fish Club** are:—Champion of Champions: 1 and 2, R. Moore. Labeo Trophy: R. Moore. Annual award: 1, B. Agnew; 2, R. Moore; 3, H. Cameron; 4, P. Gordon. Coldwater Trophy: W. Thompson. Junior Annual Award: F. Johnston. Club Quiz Trophy: 1, N. Grant; 2, A. Munnoch. Winner of Inter-Club Table Show, Most Points: A. Fyfe. Winner of Inter-Club Table Show: West of Scotland Exotic Fish Club.

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THE number of entries for the **High Wycombe A.S.** annual open show was a record, the final figure being exactly 500. Results were as follows. Class Ag: 1, K. S. Lewis; 2, Mrs. C. Sheldon; 3, Mrs. B. D. Scates; 4, I. R. Pierce. Class B: 1, R. Leslie; 2, C. Kislingbury; 3, W. H. Onslow; 4, A. S. Cripps. Class C: 1, D. E. Schramm; 2, C. W. Goddard; 3, A. Thacker; 4, L. G. Little. Class Ca: 1 and 3, R. G. Cox; 2, C. Kislingbury; 4, G. Lester. Class D: 1, T. Hall; 2, I. R. Pierce; 3, D. Bryden; 4, A. J. Crew. Class Db: 1, C. Kislingbury; 2, T. Fraser; 3, S. Broome; 4, L. Jones. Class E: 1, R. J. Canning; 2, T. Cruickshank; 3, C. W. Goddard; 4, L. Jones. Class Ea: 1, A. J. Crew; 2, A. Thacker; 3, Mrs. M. Crew; 4, P. Shepherd. Class F: 1 and 2, R. Norris; 3, Mrs. J. Garrad; 4, K. L. Lloyds. Class G: 1, Mrs. S. Hedges; 2, K. A. Beadle; 3, Mrs. M. Nethersell; 4, A. Haley. Class H: 1, Mr. and Mrs. Murphy; 2, C. W. Goddard; 3, P. Rushbrooke; 4, Mrs. M. Nethersell. Class J: 1, T. Hall; 2, K. A. Beadle; 3, Mrs. R. D. Scates; 4, C. P. Hodgenson. Class K: 1, T. Cruickshank; 2, T. Fraser; 3, C. Kislingbury; 4, Mrs. J. Garrad. Class L: 1 and 3, R. Leslie; 2, L. J. Brazier; 4, W. H. Onslow. Class Ma: 1, Mrs. S. Hedges; 2, L. J. Brazier; 3, Mrs. J. Lloyds; 4, J. Nethersell. Class Ma: 1, Mrs. M. Nethersell; 2, Mrs. M. Crew; 3, J. Hughes; 4, L. G. Little. Class Nb-m: 1, R. Leslie; 2, R. Cox; 3, L. J. Brazier; 4, G. Lester. Class No-t: 1, J. Bushby; 2, R. J. Hard; 3, P. Grosvenor; 4, Mrs. D. Cruickshank. Class O: 1 and 3, C. P. Hodges; 2 and 4, Mr. and Mrs. Murphy. Class P: 1 and 2, C. Kislingbury; 3, P. Grosvenor; 4, R. G. Cox. Class Q: 1 and 2, I. R. Pierce; 3, R. J. Canning; 4, W. H. Onslow. Class R: 1, A. S. Cripps; 2, K. A. Hillier; 3, L. G. Little; 4, Mr. and Mrs. Murphy. Class S: 1, C. Kislingbury; 2, Mrs. M. Nethersell; 3, Mrs. P. Chambers; 4, L. G. Little. Class T: 1, L. G. Little; 2, Mrs. D. Cruickshank; 3, M. Harris; 4, R. J. Canning. Class U: 1 and 3, G. King; 2, Mrs. S. Hedges, Joint 4, C. Speaks and A. J. Crew. Class V: 1, L. F. Clements; 2, R. Elsden; 3, F. Pinder; 4, C. Speaks. Class W: 1, Mrs. S. Hedges; 2, C. Speaks; 3 and 4, F. Pinder. Class Xb-m: 1, I. R. Pierce; 2, D. Sheridan; 3, P. Roberts; 4, D. Lyne. Class Xo-t: 1, Miss C. Jones; 2, Mrs. M. Crew; 3, L. G. Little; 4, A. E. Noronha. Class Xo-w: 1, G. King; 2 and 3, F. Pinder.

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A TALK on the furnished aquarium was given by R. Matley at the August meeting of the **Bournemouth A.S.** He gave members a number of valid points as to the setting up of a furnished aquarium for competition, and this was nicely timed as the Society held the annual home furnished aquarium competition the following month. He gave members pointers on what not to do, such as, no artificial objects, a bad choice of fish, i.e., small fish with large ones, fishes that are not fully grown (as these would be down pointed, compared with mature fish), cloudy water, dirty glass (i.e., algae on glass as to impair vision), untidy rock work and bad planting, too many fish and also the lack of them. Avoid sharp points and edges on the rocks. Try to match the rocks when placing them in the aquarium. When planting plants make sure that no roots are showing. Monthly table show results: A.V. Guppy: 1, K. Gibbs; 2, Mrs. I. Bebb; 3, Mr. Chatfield. A.V. Danio, Rasboras, W.C.M.M.: 1 and 2, Mr. Middleton; 3, Mr. Bebb. A.V. Labyrinth: 1, Mr. Chatfield; 2, Mrs. Bebb; 3, Mr. Middleton. O.B. Pairs (Livebearers): 1 and 2, Mrs. Bebb; 3, Mr. Middleton. The secretary is R. Matley, 36 Blake Dene Road, Parkstone, Poole.

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THE **Basingstoke A.S.** achieved the target entry they have aimed at, and worked for, over several years. They received a total of 1,170 entries, and there were 1,074 entries benched and judged, with all entries being pointed by a total of fourteen judges. Twelve South Shields members were in attendance to take part in a "twinning" ceremony of the two clubs. This consisted of an exchange of scrolls to mark the existence of the deep friendships that have been built up between the members of both societies since we started to correspond to each other in an attempt to dissipate any misunderstanding that may exist between North and South in the hobby.

Best Fish in Show was won by P. Brown of Southampton A.S. in the Dz Cichlid Class; Master S. Hamm of the B.M.A.A. (Torquay) won the Junior Trophy; Mrs. Pat Lambourne of Rochampton A.S. was the winner of the Best Ladies Exhibit Trophy and Mrs. May Nethersell of Riverside A.S. won the Best Ladies "Cat" Trophy. The highest pointed Society Trophy went to Runnymede A.S. with 30 points, Gosport A.S. and Sudbury A.S. were joint second with 26 points. The highest pointed competitor was K. Usher. The rest of the results were: Furnished Aquaria: 1 and 2, K. Lewis (Rochampton); 3, Mrs. Doubleday (B.M.A.A.); 4, B. Bargery (Godalming). Large Barbs: 1 and 2, K. Smith (Runnymede); 3, J. Jackson (Basingstoke); 4, R. Adams (Salisbury). Barbs A.O.V.: 1, Doris Cruickshank (Ealing); 2, M. Strange (Basingstoke); 3, Mrs. Bishop (Bishops Cleeve); 4, A. Blake (Basingstoke). H.H. and C.: 1, R. Cox (High Wycombe); 2, C. Turner (Cardiff); 3, K. Usher; 4, L. Brazier (Sudbury). "Pencils": 1, K. Smith (Runnymede); 2, E. Fantham (Sudbury); 3, K. Hillier (Newbury); 4, I. Clarke (Gosport). Characins A.O.V.: 1, P. Lambourne (Rochampton); 2, A. Taylor (Sudbury); 3, I. Strange (Basingstoke); 4, Mr. and Mrs. Feek (Brighton & S.). Angels: 1, F. Willis (Havant); 2, T. Winter (Southampton); 3, K. Usher; 4, G. Dixon (Basingstoke).

Dwarf Cichlids—F.B.A.S. Championship Trophy Class: 1 and 3, T. Winter (Southampton); 2, T. Frazer (Basingstoke); 4, B. Bissoon (Basingstoke). Haplochromis Derivatives: 1, May Netherscll (Riverside); 2, A. Liddle (Ashington); 3, K. Rees (Gosport); 4, L. Little (Bracknell). Cichlids A.O.V.: 1, P. Brown (Southampton); 2, R. Adams (Salisbury); 3, S. Freemantle (Gosport); 4, A. Hall (High Wycombe). Fighters: 1, B. Bissoon (Basingstoke); 2, P. Shepherd (Reading); 3, D. Phippen (Bath); 4, A. Crow (Wellingborough). Labyrintha: 1, Mrs. Parrish (Hounslow); 2, A. Weaire (Southampton); 3, D. Phippen (Bath); 4, M. Lewis (Sudbury). Killies: 1, L. Derrick (Croydon); 2, J. Jackson (Basingstoke); 3, F. Askew (South Shields); 4, P. Roberts (Bracknell). Killies A.O.V.: 1, A. Weaire (Southampton); 2, M. Cotts (Gosport); 3, D. Russo (Southampton); 4, B. Bissoon (Basingstoke). G. Catfish: 1, E. Fantham (Sudbury); 2, J. Jackson (Basingstoke); 3, D. Childs (Bracknell); 4, N. Davis (Havant). Corydoras: 1, T. Frazer (Basingstoke); 2 and 3, K. Taylor; 4, T. Adams (Southern Independent). Rasboras: 1 and 4, A. Harmsworth (Basingstoke); 2, K. Rees (Gosport); 3, B. Mason (Roehampton). Danios: 1, T. Cruikshank (Ealing); 2, T. Frazer (Basingstoke); 3, C. Kislingbury (Runnymede); 4, R. Kerrige (Harlow). Loaches: 1, J. Burtles (Mid-Sussex); 2, A. Tull (Salisbury); 3, R. Leslie (High Wycombe); 4, B. Bissoon (Basingstoke). Egglayers A.O.V.: 1 and 3, I. Clarke (Gosport); 2, F. Willis (Havant); 4, L. Brazier (Sudbury). Male Guppy: 1, J. Bailey (Sudbury); 2, A. Hall (High Wycombe); 3, B. Webb (Bath); 4, D. Hole (Basingstoke). Female Guppy: 1, P. Grosvenor (Runnymede); 2, C. Kislingbury (Runnymede); 3, D. Kerr (Salisbury); 4, J. Richards (Sudbury). Swords: 1, E. Fantham (Sudbury); 2 and 3, B. Bissoon (Basingstoke); 4, A. Blake (Basingstoke). Platies: 1, A. Cripps (Basingstoke); 2, B. Mason (Roehampton); 3, R. Davis (Cardiff); 4, J. Bishop (Bishops Cleeve). Mollies: 1, T. Adams (S. Independent); 2, L. Little (Bracknell); 3, C. Kislingbury (Runnymede); 4, M. Reilly (Runnymede). Livebearers A.O.V.: 1, K. Usher; 2, B. Bissoon (Basingstoke); 3, D. Cruikshank (Ealing); 4, L. Little (Bracknell). Pairs Egglaying: 1, C. Kislingbury (Runnymede); 2, C. Turner (Cardiff); 3, J. Lewis (Sudbury); 4, B. Bissoon (Basingstoke). Pairs Livebearers: 1, K. Usher; 2, P. Walker (Sheaf Valley, Sheffield); 3, K. Dryden (Croydon); 4, A. Cripps (Basingstoke). Breeders Egglayers: 1, F. Willis (Havant); 2, D. Sheridan (Newbury) 3, J. Robertson (Mount Pleasant); 4, M. Carter (Southampton). Breeders Livebearers: 1, B. Bissoon (Basingstoke); 2, Mr. and Mrs. Newbury (Gosport); 3, A. Novonha (Orpington); 4, D. Reilly (Runnymede). Breeders Livebearers: 1 and 2, K. Usher; 3, P. Walker (Sheaf Valley, Sheffield); 4, C. Turner (Cardiff). Goldfish: 1, F. Pinder; 2, D. Haines (Gosport); 3, V. Voysey; 4, A. Crew (Wellingborough). London Shubunkins: 1 and 2, E. Binstead (Portsmouth); 3, T. Click (Rhondda); 4, F. Pinder. Bristol Shubunkins: 1, W. Crockford (Petersfield); 2, T. Click (Rhondda); 3, Rudland and Green (Reading); 4, L. Menhennet (New Forest). Twintails: 1, 2 and 3, Rudland and Green (Reading); 4, F. Pinder. Coldwater A.O.V.: 1, E. Binstead (Portsmouth); 2 and 3 M. Bishop (Bishops Cleeve); 4, F. Pinder. Tropical Marines: 1, J. Mears (Basingstoke); 2, T. Taylor (Basingstoke); 3, M. Biggang; 4, T. Cripps (Basingstoke). Native Marines: 1, Mrs. Doubleday (B.M.A.A. Torquay); 2 and 4, S. Hamen (B.M.A.A. Torquay); 3, L. Wilkins (B.M.A.A. Torquay). Snail Novelty Class: 1, B. Scott (South Shields); 2, Rudland and Green (Reading); 3, J. Vogelaar; 4, B. Risbridger (South Shields). The trophy for Best Shark was won by M. Rielly of Runnymede. The largest society entry of over 80 exhibits came from Gosport and the largest class was Barbs with 65 fish judged.

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THE **West Cumberland A.S.** meeting was held during the annual holiday period when the attendance was rather low, but a most entertaining evening was spent by everyone. Committee members were asked to bring along any species of fish and give a short talk to be followed by a discussion from other members. A slide show which was set up for the second half of the meeting was held over for the next meeting. Results of the table show were: A.O.V.: 1 and 2, C. Davidson. Pairs (Egglayers): 1, B. H. Bray; 2, A. Parsley; 3, C. Davidson.

It was decided to run a trip to the British Aquarist Festival. Two buses have been booked and forty-nine seats are already taken. Any keen aquarist in the area would be welcome to reserve a seat. Enquiries should be made to B. H. Bray Middle-Moor, Stainburn, Workington, Cumberland. Phone: Workington 3225.

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WHEN **Llantwit Major A.S.** (F.B.A.S. and C.N.A.A.) held their August meeting there was also a table show in which members competed for the Club's Perpetual Trophies. Results: A.O.V. Livebearers: 1 and 3, G. Fry; 2, 4 and 5, A. Ibbertson. The judge was Collin Turner (F.B.A.S. and C.N.A.A.). While the judging was in progress members were entertained with an excellent slide show by D. Warmeant a R.A.D.F.A. and Rhondda A.S. member. The standard of slides are to be recommended to any society who may require an interesting evening.

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THE **Bradford and District A.S.** members heard a talk recently from A. Firth on equipment that is in use in the aquarium, from glazing the tank to brine shrimp hatches. The new headquarters are at the Textile Hall in Westgate, and the meetings are now held on the second Thursday and the fourth Thursday each month. The secretary is D. H. Edmondson, 11 Valley Court, Liversedge, Yorks.

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MEMBERS and visitors of the **Gloucester Fishkeeping and Social Club** attending the August meeting were fortunate to have a most interesting speaker visit them upon this occasion. John Colborn, who is the Curator of Reptiles and Amphibians at the Cotswold Wildlife Park at Burford in Oxfordshire, proved to be an entertaining speaker. His talk was illustrated by slides of the Reptiles and Amphibians kept at the park and he also brought with him some live specimens, one of which was an eighteen-month-old Indian Python which seemed very much to enjoy all the attention it received from members, being passed from one to another once everyone had got over the shock of such an unusual visitor to the meeting.

The business of the evening centred mainly on the forthcoming six-a-side show which is to be held on 6 October at the Tuffley Old Community Centre. This is a show open to aquarist clubs in the near vicinity, in which each club enters six Livebearers and six Egglayers in competition with each other. There are prizes for the best Egglayer, the best Livebearer and the best fish in the show. Table show winners for the evening, for A.V. Sharks and Loaches, were: 1 and 2, J. Bartlett; 3 and 4, M. Burke.

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RESULTS of the **Castleford A.S.** second open show were as follows:—Guppies: 1, Mr. and Mrs. Emerson (Castleford); 2, Mr. Sneddon (Hartlepool); 3, Mr. and Mrs. D. Kirk (Castleford). Platies: 1, Mr. Evans (Worksop); 2, Mrs. A. Feasey (Doncaster); 3, Mr. Blundell (Doncaster). Swordtails: 1, G. Thickbroom (Castleford); 2, Mr. and Mrs. Banch (Hull); 3, Mr. and Mrs. Roberts (Doncaster). Mollies: 1, Mrs. Igoe (Sherwood); 2, Mr. Booth (Castleford); 3, Mr. and Mrs. Snowdon (York and District). A.O.V. Livebearers: 1, B. Jackson (Doncaster); 2, Mr. Blundell (Doncaster); 3, Mr. and Mrs. Walker (Sheaf Valley). Small Characins: 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Toyne (Sheaf Valley); 3, Mr. and Mrs. Norton (South Humberside). Large Characins: 1 and 3, A. Frisby (Hull); 2, R. Atherton (Hartlepool). Rasboras, Danios, Minnows: 1 and 3, T. Smith (Sheffield); 2, Mr. Blundell (Doncaster). Small Barbs: 1, Mr. and Mrs. J. Whiteley (Aireborough); 2, Mr. and Mrs. Norton (South Humberside); 3, Mr. and Mrs. Walker (Sheaf Valley). Large Barbs: 1, T. Nicholson (Sherwood); 2, M. Ambler (Swillington); 3, Mr. and Mrs. Cohen (Pontefract). Dwarf Cichlids: 1, McArdle and Kirk (Castleford); 2, Mr. and Mrs. J. Whiteley (Aireborough); 3, G. Thickbroom (Castleford). Large Cichlids: 1, T. Nicholson (Sherwood); 2, J. Robertson (Northumbrian); 3, Mr. and Mrs. J. Whiteley (Aireborough). Angels: 1, Mr. and Mrs. Sellors (Lincoln); 2, J. Igoe (Sherwood); 3, J. Dunn (Horsforth). Malawi Cichlids: 1, R. Atherton (Hartlepool); 2, Mr. and Mrs. Sellors (Lincoln); 3, G. McGuire (Hartlepool). Fighters: 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Sellors (Lincoln); 3, G. McGuire (Hartlepool). Fighters: 1, D. and M. Laycock (Sheaf Valley); 2, Mr. and Mrs. Sellors (Lincoln); 3, L. Smith (Castleford). Small Anabantids: 1, McArdle and Kirk (Castleford); 2, Mr. and Mrs. Roberts (Doncaster); 3, G. White (Scunthorpe and District). Large Anabantids: 1, Mr. and Mrs. Simpson (Worksop); 2, A. R. Thompson (Bishop Auckland); 3, J. Riley (Leeds G.P.O.). Toothcarps: 1, G. White (Scunthorpe and District); 2, N. Carr (Doncaster); 3, T. Reid (Worksop). Loaches and Botias: 1, Mr. and Mrs. D. Caldow (Scunthorpe and District); 2 and 3, Mr. and Mrs. Toyne (Sheaf Valley). Sharks and Foxes: 1, G. Thickbroom (Castleford); 2, P. Hislop (Swillington); 3, Mrs. S. Clark (Aireborough). Corydoras: 1, Mr. and Mrs. Fletcher (Doncaster); 2, Mr. Blundell (Doncaster); 3, Mr. and Mrs. Sellers (Lincoln). A.O.V. Catfish: 1, Mr. and Mrs. Cohen (Pontefract); 2, K. Fancashire (Doncaster); 3, H. Thorpe (Doncaster). Pairs Egglayers: 1, T. Reid (Worksop); 2, Mr. Blundell (Doncaster); 3, Mr. Evans (Worksop). Pairs Livebearers: 1, Mr. and Mrs. J. Whiteley (Aireborough); 2, Mr. and Mrs. Walker (Sheaf Valley); 3, Mr. and Mrs. Toyne (Sheaf Valley). A.O.V. Tropical: 1, A. R. Thompson (Bishop Auckland); 2, Mr. and Mrs. D. Caldow (Scunthorpe and District); 3, McArdle and Kirk (Castleford). Junior Egglayers: 1, Master J. Emerson (Castleford); 2, A. Milner (Castleford); 3, Master D. Kirk (Castleford). Junior Livebearers: 1, A. Clark (Castleford); 2, Miss K. Simpson (Worksop); 3, A. S. Furness (Castleford). Novice A.V.: 1, Mrs. Green (Castleford); 2, Mr. Firth (Independent); 3, Mr. and Mrs. Thomas (Independent). Ladies A.V.: 1 and 3, P. Hislop (Swillington); 2, Mrs. V. Atherton (Hartlepool). Breeders Livebearers 1-10: 1, Mr. and Mrs. Feasey (Doncaster); 2, Mr. and Mrs. Kilvington (Doncaster); 3, Mr. and Mrs. Walker (Sheaf Valley). Breeders Livebearers 11-20: 1, Mr. and Mrs. Walker (Sheaf Valley); 2 and 3, Mr. and Mrs. Kilvington (Doncaster). Breeders Egglayers 1-10: 1, Mr. and Mrs. Cohen (Pontefract); 2, P. Armstronge (Heywood); 3, H. Thorpe (Doncaster). Breeders Egglayers 11-20: 1, Mr. and Mrs. Fletcher (Doncaster); 2, N. Carn (Doncaster); 3, S. Nichols (Swillington). Shubunkins and Fancy Coldwater: 1, Miss S. Clark (Aireborough); 2, Mr. and Mrs. E. Asquith (Castleford); 3, Miss J. Lodge (Castleford). A.O.V. Coldwater: 1, Miss S. Clark (Aireborough); 2, Master D. Frisby (Hull); 3, Mrs. Frisby (Hull). Fish with most Points: Mr. and Mrs. D. Caldow (Scunthorpe and District). Society with most Points: Doncaster. Exhibitor with most Points: Mr. and Mrs. J. Whiteley (Aireborough). There was a total of 666 entries. Aquarist Gold Pin was won by Mr. and Mrs. D. Caldow.

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THE speaker at the first August meeting of **Hastings and St. Leonards A.S.** was Ian Sellick, of Bristol. His subject was the coloration of fishes and he explained how a colour change took place when a fish was frightened and also played an important role in communication between fishes, particularly in courtship. The table show for Cichlids was won by Mr. and Mrs. Young.

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At the following meeting D. Jolliffe of Bexhill A.S. announced the results of the Pond Competition held earlier in the year. These were, 1, Mrs. Goschalk; 2, Mr. Reed; 3, Mr. MacCormick. The evening ended with "Try your Hand at Judging," and this gave all members a chance to do some judging.

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OVER 200 entries for 25 classes were entered for **Dorchester and District A.S.** club show this year. The results were as follows:—Furnished Aquaria: 1, P. Legg; 2, P. Jefferys; 3, Mrs. W. Angel; 4, H. W. Cornick. Barbs: 1, G. W. Fox; 2, R. W. Taylor; 3 and 4, T. Hatton. Characins: 1 and 2, G. M. Fox; 3, G. Fitzgerald; 4, R. Christopher. Hemis, Hyphs, Chirodon: 1, R. W. Taylor; 2, G. Fitzgerald; 3, R. Christopher; 4, D. Norman. Cichlids: 1 and 3, R. W. Taylor; 2, G. Fitzgerald; 4, G. M. Fox. Angelfish: 1, T. Hatton; 2, 3 and 4, R. Christopher. Labyrinths: 1, P. Legg; 2, R. W. Taylor; 3, Mrs. N. E. Fox; 4, A. Billington. Siamese Fighters: 1, R. W. Taylor; 2, M. Cleall; 3, R. Christopher; 4, Mrs. M. Angel. Tropical Catfish: 1, R. Vose; 2, and 3, R. W. Taylor; 4, P. Legg. Corydoras and Brochis: 1, B. Norman; 2, T. Hatton; 3, G. Fitzgerald; 4, R. Christopher. Rasboras: 1, R. Christopher; 2 and 3, D. Norman; 4, Miss H. Fitzgerald. Danios and White Cloud Mountain Minnows: 1, A. Billington; 2, Mrs. M. E. Fox; 3 and 4, M. Cleall. Loaches and Botias: 1, T. Hatton; 2, G. Fitzgerald; 3, W. Cleall; 4, Mrs. M. Fox. A.O.S. Egglayers: 1, Mrs. I. Christopher; 2, T. Hatton; 3, G. Fitzgerald; 4, C. M. Fox. Pairs of Fish: 1, R. Christopher; 2, T. Light; 3, T. Hatton; 4, P. Jefferies. Male Guppies: 1, 3 and 4, Mrs. H. Cleall; 2, T. Light. Female Guppies: 1 and 2, Mrs. N. E. Fox; 3, Miss L. Fox; 4, Mrs. H. Cleall. Swordtails: 1, G. Fitzgerald; 2, S. T. Payne; 3, T. Light; 4, R. Christopher. Platies: 1, G. N. Fox; 2, T. Hatton; 3 and 4, A. Billington. Mollies: 1 and 2, W. Cleall; 3, T. Light; 4, R. Christopher. A.O.S. Livebearers: 1, A. Billington. Common Goldfish: 1 and 3, R. Christopher; 2, Mrs. M. B. Fox; 4, P. Jefferies. Shubunkins: 1 and 4, R. Christopher, 2, H. W. Cornick; 3, Mrs. M. W. Fox. A.O.S. Coldwater: 1, R. Christopher; 2 and 3, G. W. Fox. Teams of Breeders: 1, 2 and 3, R. Christopher; 4, S. T. Payne. Best Junior Entry: P. Legg. Best Fish in Show: R. Christopher. Best Coldwater Fish: R. Christopher. Best Tropical Fish: Mrs. I. Christopher.

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OPEN show results of the **Runcorn A.S.** were as follow:—Guppies: 1 and 2, S. Manser (Sandgrounders); 3, Mr. and Mrs. Muckle (Independent). Mollies: 1, A. Atherton (Grimwood); 2, R. I. Payne (Merseyside); 3, Master M. N. Rimmer (Sandgrounders). Platies: 1, Mr. and Mrs. Bond (Sandgrounders); 2, G. Waterhouse (Sandgrounders); 3, S. Manser (Sandgrounders). Swordtails: 1, S. Hooton (Sandgrounders); 2, G. Waterhouse (Sandgrounders); 3, M. Mullen (Sandgrounders). Small Barbs: 1, Miss J. Gullane (Buxton); 2, R. I. Payne (Merseyside); 3, R. Smith (Wrexham). Large Barbs: 1, Mr. and Mrs. Ward (Middleton); 2, P. and H. Batchelor (Loyne); 3, B. Newport (Runcorn). Labeos, Sharks and Flying Fox: 1 and 3, T. Hampton (Merseyside); 2, Miss J. Gullane (Buxton). Loaches: 1, D. Walker (Runcorn); 2, C. Pritchard (Wrexham); 3, Mr. and Mrs. Bond (Sandgrounders). Corydoras Catfish: 1, M. Clarke (Buxton); 2 and 3, D. Reading (Merseyside). A.O.V. Catfish: 1, D. T. Armour (Independent); 2, Mr. and Mrs. Bond (Sandgrounders); 3, D. Walker (Runcorn). Anabantids: 1, Mrs. V. Oliver (Wrexham); 2, C. Norton (Sandgrounders); 3, G. Waterhouse (Sandgrounders). Fighters: 1 and 3, B. W. Carter (Merseyside); 2, Mr. and Mrs. Royle (Northwich). Dwarf Cichlids: 1, B. W. Carter (Merseyside); 2, J. Taylor (Merseyside); 3, Mrs. V. Oliver (Wrexham). Large Cichlids: 1, S. Hooton (Sandgrounders); 2, R. Atherton (Grimwood); 3, J. Taylor (Merseyside). Angels: 1, C. Norton (Sandgrounders); 2, S. Harvey (Merseyside); 3, D. Reading (Mersey side). Small Characins: 1, K. Smith (Middleton); 2, R. Jenkinson (Merseyside); 3, J. Taylor (Merseyside). Large Characins: 1, B. and B. Booker (Morecambe Bay); 2, K. Smith (Middleton); 3, Mrs. and Mr. Bond (Sandgrounders). Tooth Carps: 1, R. I. Payne (Merseyside); 2, Mr. and Mrs. Sillen (Hoylake); 3, F. Thorne (Village). Rasboras and Danios: 1, J. Drake (Runcorn); 2, T. Hampton (Merseyside); 3, B. Bamber (Sandgrounders). Breeders, Egglayers: 1, R. I. Payne (Merseyside); 2, D. Reading (Merseyside); 3, J. Taylor (Merseyside) Breeders, Livebearers: 1, J. Sergeant (Wrexham); 2, S. Hooton (Sandgrounders); 3, Mr. and Mrs. Muckle (Independent). Trio Pairs Egglayers: 1, J. Pritchard (Grimwood); 2, Mr. and Mrs. Muckle (Independent); 3, Mr. and Mrs. Haddow (Hyde). True Pairs Livebearers: 1, K. and F. Tarburton (Warrington); 2, S. Hooton (Sandgrounders); 3, J. and K. Hinchey (Loyne). A.O.V. Tropical: 1, Mr. and Mrs. Ward (Middleton); 2, B. and B. Booker (Morecambe Bay); 3, P. and H. Batchelor (Loyne). Juniors A.O.V.: 1, P. Hinchey (Loyne); 2, J. Taylor (Merseyside); 3, A. Hinchey (Loyne). Ladies A.O.V.: 1, Mrs. B. Booker (Morecambe Bay); 2, Mrs. K. Hinchey (Loyne); 3, Mrs. Bond (Sandgrounders). Fancy Goldfish: 1 and 2, C. H. Whitsey (Accrington); 3, J. Hall (Runcorn). A.O.V. Coldwater: 1, R. Atherton (Grimwood); 2, M. Valentine (Northwich); 3, J. Taylor (Merseyside). Common Goldfish: 1, G. Millman (Warrington); 2, D. Valentine (Northwich); 3, C. H. Whitsey (Accrington). Best Fish in Show: M. Clarke (Buxton). Club with most Points: Merseyside. Runcorn Senior Member with most Points: D. Walker. The Jack Faulkner Memorial Trophy: D. Walker.

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THE main item at the August meeting of the **Suffolk Aquarists & Pondkeepers Association** was a slide show supported by a table show. The new meeting place for the monthly meetings is the "Sporting Farmer."

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A DEMONSTRATION was given by R. Christopher at the August meeting of the **Dorchester and District A.S.** on how to set up a furnished aquaria. This was followed by an open invitation to club members to demonstrate their skills and ideas in setting up a furnished aquaria. These in turn were judged by all members of the club present with the final result as follows: Juniors: 1, Lorna Fox; 2, Roy Christopher; 3, Nicola Derrick; 4, P. Bilk. Seniors: 1, A. Light; 2, N. Derrick; 3, Mrs. Cook; 4, Mrs. J. Belt. The results of the table show was as follows: Juniors (A.V. Tropical Catfish): 1, P. Legg; 2, R. Cook. Seniors (Shubunkins): 1 and 2, R. Christopher.

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THE Birmingham Section of the **Fancy Guppy Association** meet on the fourth Sunday afternoon of each month at the Glebe Farm Community Centre, Stechford, Birmingham. Last month three new members were enrolled. Visitors are always welcome. The secretary is G. Beacham, 35 Frankton Close, Matchborough, Redditch. Ryknild 4697.

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THE annual club show and exhibition of the **Weymouth A.S.** proved to be the biggest and most successful show yet held by the club. Over 400 fish were on display, including furnished aquaria and a two-feet long Fire Eel. Nearly 550 members of the public visited the show and were very impressed in the way the club had provided an interesting and spectacular occasion. The principal prize winners were as follow: Winner of the President's Cup for the Best Fish in the Show and the Prince Regent Cup for the best catfish was E. Dalley with a Pimelodella. The Reyland Cup for the Best Sexed Pair went to M. Medway with a pair of Emperor Tetras; Allans Cup for the Furnished Aquaria Class went to D. Mullen and the Naomi Worth Trophy for the Best Coldwater Fish was won by J. White with a Twintail. The club would like to take this opportunity to thank all those who so generously gave their support in making the show a great success. Meetings are held on the second Tuesday of each month at 7.30 p.m. at the Ratcliff Hall, Queens Road, Radipole Spa, Weymouth, Dorset. New members and visitors are very welcome.

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IN April the **Isle of Wight A.S.** held their annual general meeting when the following members were elected as Officers for the 1974/75 season. Chairman: J. J. Sole, Vice-Chairman: D. Crisp; Secretary: E. T. Davison, Assistant: Miss P. Minter, Treasurer: S. Stevens; Show Secretary: F. Whitehouse; Assistant: R. McHugh; Publicity: Mrs. E. Ford; Committee Member: R. Woodnutt. As the island has a busy Summer Season the activities of the club are confined to the winter months, but plans are going through at the moment for inter-club shows which are booked for November. Any aquarists from other clubs who are on holiday on the island are invited to come along to the meetings which are held on the second and fourth Wednesdays in the month. The secretary's address is E. T. Davison, 89 High Street, Shanklin, I.O.W.

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TOTAL number of entries for the **Wellingborough and District A.S.** annual open show was 498 and the results were as follow: Barbs: 1 and 3, Mrs. D. Cruickshank; 2, L. Brazier; 4, Mr. Watts. Characins: 1, P. Moye; 2, D. Reilly; 3, R. Elliott; 4, G. Allen. Cichlids: 1, M. Strange; 2, D. Reilly; 3, J. Bayly; 4, J. Salisbury. Angels: 1, B. Tyler; 2, Mrs. D. Chambers; 3, A. Crew; 4, S. Watts. Dwarf Cichlids: 1, T. Taylor; 2, A. Crew; 3, M. Lewis; 4, D. Reilly. Anabantids: 1 and 4, A. Magland; 2, R. Marshall; 3, D. Reilly. Mollies: 1, D. Reilly; 2, Mr. Borrill; 3, M. Strange; 4, L. Brazier. Catfish: 1, A. Magland; 2 and 3, T. Pilsbury; 4, J. Hughes. Corydoras: 1 and 2, L. Brazier; 3, P. Moye; 4, R. Walden. Rasboras: 1, L. Brazier; 2, D. Reilly; 3, D. Chambers; 4, G. Hayes. Danios: 1, T. Cruickshank; 2, P. Flint; 3, J. Jackson; 4, R. Elliott. Loaches: 1, Mrs. Drage; 2, 3, and 4, D. Bitchener. A.O.S. Tropical Egglayer: 1, J. Bayly; 2, L. Brazier; 3, T. Taylor; 4, M. Crew. Pairs: 1, J. Bayly; 2, Mr. Strange; 3, G. Lester; 4, J. Richards. Guppy Male: 1 and 4, D. Carnegie; 2, A. Taylor; 3, G. Allen. Platy: 1, M. Lewis; 2, G. Lester; 3, A. Crew; 4, D. Reilly. Molly: 1, Mrs. D. Chambers; 2, D. Reilly; 3, P. Moye; 4, T. Taylor. A.O.S. Livebearer: 1, D. Carnegie; 2, D. Cruikshank; 3, L. Poole; 4, R. Impey. Goldfish: 1 and 4, A. Crew; 2 and 3, M. Crew. Goldfish: 1 and 4, J. Salisbury; 2, J. Jackson; 3, R. Bentley. Broods XMB: 1, P. Moye; 2, F. Vickers; 3 and 4, G. Hayes. Broods XOT: 1 and 4, R. Impey; 2, G. Hayes; 3, Mrs. Drage. Best fish in show won by M. Strange with a Gold Severum. A Crew won the F.B.A.S. for the best single-tailed goldfish.

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NEW SOCIETIES

THE **Dow Corning A.S.** has been formed with approximately 25 members. The Club night is the first Wednesday in the month and any person wishing to join should contact the Secretary, A. Jarvis, 37 Castle Street, Barry, Glamorgan.

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THE **Coldwater, Tropical and Marine Fish Club of Abertillery** has been formed. The officers are as follow: Chairman: D. Beddis; Vice-Chairman: N. Bryant; Secretary: P. Milton. The meetings are held at the Blaenau Gwent Workmens' Club every other Tuesday at 8 p.m. Anyone wishing to join should contact P. Milton, 19 Grosvenor Road, Abertillery, and would be welcome at the meetings.

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CHANGE OF NAME

Midland Cichlid Society has now changed to the **British Cichlid Society, West Midland Group.** The meetings remain the same, on the second Tuesday of the month at Midland

Vaults, Upper High Street, Wednesbury, Staffs.

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SECRETARY CHANGES

Leigh A.S.: Mrs. Margery A. Galloway, 4 Kenilworth Road, Lowton, Warrington. WA13 2AZ.

The Acting Secretary to the **British Cichlid Association** is Mr. T. Green and all correspondence should be sent to him at the following address, 12 Greenwood Meadow, Chinnor, Oxford.

Lower Gornal and District A.S.: B. Weston, 5 Valley Road, Lye, Stourbridge. Tel: Lye 4744. Show Secretary: T. Satherthwaite, 11 Eggerton Road, Bushbury, Wolverhampton.

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SHOW VENUE CHANGE

The **Ilfracombe and District A.S.** will now hold their open show at the Junior School, Princess Avenue, Ilfracombe. The change has been necessary due to booking difficulties with the previous venue. Entry forms are still available from Mrs. S. Lampacomb, 8 Foxbear Road, Ilfracombe.

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VENUE CHANGE

The **Ashfield Fishkeepers Club,** Sutton-in-Ashfield' has moved their headquarters to the "Crown and Woolpack." The meeting night has also be changed from Wednesday to Tuesday.

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AQUARIST CALENDAR

5th October: Cardiff A.S. Open Show at St. Margarets Church Hall.

6th October: Vauxhall Motors Recreation Club Aquarist Section second Open Show. Details and Show Schedules available from the Show Secretary, A. D. Philip, 15 Hollybush Road, Luton, Beds. LU2 9HG.

6th October: Fifth annual Open Show organised by the Newcastle Guppy and Livebearer Society at the Civic Hall, Gosforth, Newcastle-upon-Tyne. This will be the first all livebearer show held in this country. Schedules available shortly from Mrs. J. Renton, 128 Dunstan Tower, Garth 18, Killingworth, Newcastle-upon-Tyne NE12 6TX.

6th October: Scunthorpe and District A.S. will be holding their first Open Show at St. Paul's Church Hall, Ashby High Street, Scunthorpe.

6th October: Hinckley and District A.S. Open Show at the Westfield Community Centre, Rosemary Way (off Coventry Road), Hinckley, Leics. Show secretary, R. Impey, 25 Beryl Avenue, Hinckley, Leics.

6th October: Kent A.A.S. Open Show, Medway and Maidstone College of Technology, Maidstone. Show secretary, T. A. King, 57 Murchison Avenue, Bexley, Kent.

6th October: Eboracum Aquarists second Annual Show, at Nunthorpe Grammar School, Philadelphia Terrace, Albemarle Road, York. Schedules from W. A. Bunnage, 22 Heathcroft, Fulford, Yorks.

12th October: Runnymede A.S. Open Show, St. Annes Middle School, Clare Road, Stanwell, Middlesex. Details: K. Smith, Ashford 59309 or Mrs. J. Garrad, Le Rivage, Long Lane, Stanwell, Middlesex.

12th-13th October: British Aquarists Festival, Belle Vue, Manchester.

19th/20th October: The Irish Tropical Fish Society will hold their third Annual Show at the Mansion House, Dawson Street, Dublin 2. Information and Show Schedules may be obtained from J. P. Naismith, Hon. Secretary, Kilgobbin, Sandyford, Co. Dublin.

20th October: Sherwood A.S. Open Show, to be held at the Thoresby Miners Welfare Hall. Edwinstowe, Ollerton, nr. Mansfield, Notts. Schedules from show secretary, J. Igoe, 25 Marples Avenue, Mansfield Woodhouse, Notts. Tel: Mansfield 32249.

27th October: Doncaster and District A.S. Open Show at Brodsworth Miners Welfare, Welfare Road, Woodlands.

27th October: Ilfracombe and District A.S. Open Show at the Junior School, Princess Avenue, Ilfracombe. Details from show secretary, Mrs. S. Lipscombe, 8 Foxbear Road, Ilfracombe, Devon.

2nd November: Goldfish Society of Great Britain (meeting). Conway Hall, Holborn, London, W.C.2. 2 p.m.

3rd November: Blackburn Aquarist Waterlife Society Open Show. Venue will be the "Windsor Hall," Blackburn. Details may be had from Show Secretary: B. Marshallsea, 10 Hawthorn Crescent, Oldham, Lancs.

10th November: Halifax A.S. Open Show at the Forest Cottage Community Centre, Cousin Lane, Illingworth, Halifax. Individual Furnished Aquaria, Plant and Marina classes included. Schedules from David Shields, "Cobblestones," Gainsit, King Cross, Halifax. Phone Halifax 60116.

10th November: Walthamstow and District A.S. Open Show.

10th November: Hartlepool A.S. 16th Annual Open Show. Longscar Hall, Seaton Carew. Schedules available later from M. Sneddon, 35 Spurn Walk, Hartlepool or S. Hay, 43 Ventnor Avenue, Hartlepool.

14th-16th November: Loughborough and District A.S. Members Furnished Aquaria Competition, venue John Storer House, Wards End, Loughborough. This is in aid of the John Storer House Foundation.

17th November: Bradford and District A.S. 27th Annual Open Show at East Bowling Unity Club, Leicester Street, Wakefield Road, Bradford.

23rd November: Fur, Feather and Aquatic Aquarium Show, King's Hall, 39 Lower Clapton Road, London, E.5. Show schedules are available from Baths and Civic Recreation Dept., London Borough of Hackney, 39 Lower Clapton Road, London E5 0NU.

1st December: Horsforth A.S. 5th Open Show at the new Civic Hall, Stanningley Road, Pudsey.

1975

6th April: Medway A.S. Annual Open Show. Further details later.

6th April: Heywood and District A.S. Open Show, Civic Hall, Church Street, Heywood, Lancs.

20th April: Merseyside A.S. Open Show, Rainhill Village Hall, Exchange Place, Rainhill, Lancs.

18th May: Middleton and District A.S. Fourth Open Show will be held at Hollin High School, Hollin Lane, Middleton. Schedules later. Only members of recognised Aquarist Societies may exhibit. No independent entries can be accepted.

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