The AQUARIST
AND PONDKEEPER

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EDITORIAL

In the past we have stressed the importance of the aquarium as a cultural and educational force, but its therapeutic value has less often been mentioned. Many illnesses and periods of convalescence are accompanied by mental depression and ennui which can be dispelled by arousing interest in aquaria, as many hospitals will testify, while doctors and dentists increasingly appreciate the soothing effect upon nervous patients of a tank in the waiting-room.

For some years it has been the practice of aquarium societies to install and maintain aquaria in their local hospitals and clinics, a gesture much appreciated by patients and staff. Some while ago we were talking to Dr. Allen at the Star and Garter Home for disabled service men at Richmond, and found him a firm believer in the aquarium as an aid to the treatment of spinal cases—and no mean aquarist himself. He maintains a range of well-stocked tanks in one of the wards, some of them given by Mrs. Riley of Croydon and some by the Twenty Club. A striking vindication of his belief is supplied by the case of Lilian Hammond, a twelve-year-old girl who is paralysed from the waist downwards and has lain for ten months in Oldchurch Hospital at Romford. Let the *Romford Recorder* tell the story :—

"It all began some months ago when the Benhurst Aquarists' Society, Elm Park, decided to present a gift to the children in a ward at the hospital. The gift took the form of a fully-equipped tropical aquarium, complete with gaily-coloured fish, sand, rocks, and all the other paraphernalia which is normally put into such tanks to make them as realistic and attractive as possible. Everyone of the members, about 40 in number, made a contribution to the tank and it was finally installed in the ward and aroused tremendous interest among the children.

It provided a bright spot in their lives, something to gaze and wonder at ; and something to help pass the time.

It was during the installation of the aquarium and its subsequent maintenance by the Society's members that the particular interest of Lilian Hammond was noticed. She became so engrossed with watching the antics of the agile fish that the secretary of the Society, Mrs. D. Aldred, and her husband, who live at 30, Benhurst Avenue, decided to make a special gift to Lilian. So, from the 40 tanks containing almost every type of fish normally kept by aquarists, which they maintain at their home, they selected one, a smaller one than that given to the ward in general, and gave it to Lilian specially for herself. She was thrilled. It had an important practical value. During the long months of Lilian's illness, doctors had tried in vain to induce movement into her helpless limbs. But when the little aquarium arrived and was placed on a window ledge behind her bed, she could look at it only by turning herself over. Her continued efforts to turn and gaze at the elegant fish in her own beloved dreamland accomplished something that the doctors' patience had never been quite able to do.

That is how a married couple have unselfishly helped to bring happiness and joy into the life of a sick little girl.

But it does not end there because Lilian is now planning to visit the home of Mr. and Mrs. Aldred to see their large collection.

She has also accepted this week the offer of an honorary membership of the Society. In a letter to the Aldreds she has said how much she is looking forward to that day in the near future when, as the ward Sister promised, she will be taken in a taxi to Elm Park. She also says how, by the hour, she rests and gazes at her own little fish, ' chasing each other'."

This surely is a moving example of the great-heartedness of aquarists, and the power for good that lies in an aquarium.

THE AQUARIST

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All communications for the Editor should be addressed: "The Editor, *The Aquarist*, The Buckley Press Ltd., The Butts, Half Acre, Brentford, Middx." In every case the name and address of the writer must be given.

The Editor welcomes the opportunity of considering original contributions on all branches of the hobby and its allied interests; authentic breeding records, personal experiences and photographs. Contributions should be typed or clearly written on one side of the paper only. MSS. or prints unaccompanied by a stamped, addressed envelope cannot be returned, and no responsibility is accepted for contributions submitted. Correspondence with intending contributors is welcomed.

The Editor accepts no responsibility for views expressed by contributors.

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Specimens should be sent direct to Mr. Cotton, with full particulars of circumstances, and a fee of 2/6.

It is important that the following method of packing fish be adopted:—Wrap fish, very wet, and loosely in grease-proof paper, and then in wet cloth. Re-wrap in greaseproof or wax paper and pack around with cotton wool in tin box. Despatch as soon as possible after death, with brief history of aquarium or pond conditions.

Water samples should be sent in a large clean medicine bottle, and contain a little bottom sediment, and a stem or two of typical plant growth.

National Aquarist Society's Exhibition

At the Royal Horticultural Hall on June 10th-12th, the N.A.S. made a determined and creditable effort to live up to its title by staging the largest aquarium exhibition yet seen, judged at least in terms of floor-space. Considering the difficulties of the present situation and the limited resources of the Society the carrying out of such an ambitious project must earn our admiration and congratulations. It was to be expected that there would be failings, and chats with various officials revealed that they were all too conscious of their existence, but no doubt the Society will be much strengthened numerically and financially by the venture and next year's exhibition will be much improved. What criticisms we have to make are aimed towards this end, and not made in any carping spirit.

The general atmosphere of the exhibition seemed to us less attractive than former shows, being too commercial. It is understandable that a show of this size entails considerable outlay and that anxiety to cover expenses should loom largely in the minds of the organisers, but we think it is important that fish-keeping should be presented to the public as a recreation rather than a money-making concern. The "catalogue" on sale consisted of four pages of information so generalised as to be practically useless to the visitor, and many pages of publicity for the trade or the Society; for this the visitor was asked to pay a shilling. This kind of thing creates a bad impression. The competitive show appeared simply as an adjunct to the large array of trade stands. The exhibits could not be seen at their best owing to the absence of lighting and heating, the "tropicals" being crowded into a dark and rather cold corner. The entries were on the whole inferior in quality (and possibly also in number) to those at other recent shows—for example the Barking Fish Exhibition reported on another page; this we believe was due partly to dissatisfaction with the schedule, the peculiarities of which seem to have resulted from a misunderstanding with the Federation which we hope will be quickly resolved, and partly to lack of publicity.

Having thus unburdened ourselves, we can once more express our admiration for the huge task tackled by Mr. L. B. Katterns, the organiser, and his team of stalwarts. There is no doubt at all that it was greatly appreciated by a large number of visitors, and well-known aquarists from many parts of the country were to be found among them.

We cannot discuss the exhibits in detail, and the full results are not to hand at time of going to press. The most satisfying, we thought, was the display of reptiles and batrachians shown by the British Herpetological Society and the South-West London Aquarists (who have a reptile section). The scaled fantail which took first prize for Mr. Boarder was the best thing in the Goldfish section; very close to the standard, this. Apart from this, a nice Veiltail and some good Moors, the section was not well supported, and we did not consider that the entries in the Common Goldfish class were worth the awards.

Some old friends appeared among the winners in the tropical section—a pair of Mr. Bone's celebrated Tiger Barbs for instance. Mrs. Meadow's winning Fighting Fish, though some way removed from the standard, was a showy and attractive specimen, and far better than most we have seen lately. We were pleased to see that the judges gave preference to pairs in most of the classes—a fine pair of *Copeina guttata* (Mr. Howard Morris) in the Characin class, a pair of Blue Acaras (Nottingham A.S.) in the Cichlids, a pair of *Badis badis* (Mr. E. C. A. Potter) in the A.O.V. and so on. The Livebearers were regrettably unimpressive, but there were a few nice Guppies, notably the Robson shown, we believe, by Mrs. Stanley of East London.

Of the innovations, the class for fish photography consisted of an array of handsome pictures, all or most of which appeared to be the work of the same person, but we have no information about names and awards. We could not find any enthusiasm for the miniature water-gardens; the idea strikes us as rather futile.

There was a good entry in the section for furnished aquaria, and the general level was high, particularly in the tropical class. Nevertheless, the tank set up by the Nottingham Aquarists' Society stood out unmistakably as the best—not because it contained a shoal of Neon Fish, but because that shoal formed a satisfactory part of a well-planned and carefully executed assembly. Nottingham is to be congratulated on a fine effort.

The exhibition was well organised, largely by loud-speaker, from the central stand of the Society, which displayed an attractively-staged range of instructional exhibits. No one can doubt the ability of the Society, and it should now have the means to produce a much better show next year; we look forward to it with anticipation.

PARISIAN HOLIDAY

By L. C. MANDEVILLE

The prospect of Continental holidays, even if with somewhat thin wallets, fills many of us with pleasant expectation; expectation, too, of the possibility of acquiring some unusual specimens for our collections and of seeing foreign public aquariums. Many folk will be finding their way to Paris, and there is much to interest the aquarist in the Gay City.

The Parisian aquarists are not organised in clubs and societies as we are, and they do not hold competitive public shows as we do, indeed from the viewpoint of the public there is no such need for Paris has three excellent permanent exhibitions, at the Trocadero, the Jardin des Plantes, and the France Overseas Museum, just by the Zoological Gardens at Vincennes. All these are readily accessible on the Metro. All are State enterprises, coming under the same administration as museums and the like, and the prices of admission are consequently, by our standards, absurdly low.

The Trocadero aquarium is more or less underground in an artificial grotto. It is devoted entirely to native fresh water species, and though fancy Goldfish hardly come into this classification there is usually on display a group of very fine Veiltails and Telescopes. The French have some excellent strains of fancy Goldfish, such as we would very much like here, but they do not seem to appear in the pet shops. Aquarium-bred trout, in an especially enormous tank, make an effective display as also do common Sunfish, and Catfish (*Ameirus*). These latter two are North American species that have adapted themselves well to life in open waters in France. The Catfish is fast becoming a major nuisance in the Seine. You will probably notice, with some amusement, that the edible Frogs are provided with ladders to climb from the water to dry land!

At the Jardin des Plantes it is the amphibians and reptiles that are the greatest attractions, the fish seem something of an afterthought and are not well displayed. The very healthy condition of the animals immediately strikes the visitor. During the summer months a number of species are in outdoor enclosures, and some of the tortoises and the alligators make a most impressive show. There is a simply enormous female Pleurodele newt here. She is over a foot long and of appropriate girth. A noteworthy exhibit in pre-war days, she is in just as good condition as ever, having satisfactorily survived all the unpleasantness of occupation days. A number of small North African mammals are also exhibited and the Fennec Foxes will delight all who see them.

Don't make the mistake of thinking you will "do" the aquarium and the Zoo at Vincennes, both in one trip. There is much to see at the quite unique Zoo and the Aquarium will hold your attention for several hours, and it is situated in the basement of the museum which itself is of unusual interest.

This aquarium is supposed to be an exhibition of of species exclusively from French overseas territory and is exclusively tropical. Either the distribution of some species is much wider than we thought or the limitation is not quite literal! The fish are especially well displayed and are in excellent condition. Many species which we know usually as single pairs are here exhibited in large shoals of adult, and the effect is quite breathtaking. Harlequins (*Rasbora heteromorpha*), Tiger Barbs of several species (the French stick to the old generic name Puntius), and several of the more unusual characins are treated like this. Worthy of especial notice are the Dwarf Cichlids, several species of African *Fundulus*, and the large Glass Catfish. The small Clawed Frog, *Xenopus tropicalis*, is on show, though this is also now at the London Zoo, and there are also *X. laevis*, of course, but what enormous specimens! But as far as one can tell they are fed in much the same way as our own.

While on the subject of feeding it might be mentioned that the Parisian aquarist uses Bloodworms (*Chironomus* larvae) very much. Most pet shops sell them and they are used chopped and mashed as well as whole. *Daphnia* is seasonal but a door-to-door service can be arranged. I was much surprised to see a chic Parisienne, complete with parasol, and carrying a tastefully decorated plastic covered package, open this and hand out a tray of *Daphnia*, delivery three times weekly, to the door, for a very modest fee.

There are pet shops dotted about Paris and aquariums are quite usual in stores and cafes, but the happy hunting ground of the aquarist are the Quai des Lugisseries and Quai des Louvre, where there is a concentration of pet shops. Prices for animals and plants are reasonable by our standards, especially as many of the species offered are quite unusual, but to the French they are probably "formidable" for the aquarium really is a luxury hobby in France. Apparatus of all kinds is costly and in quality seems to compare unfavourably with our standards.

Just now all the shops will have stocks of French species of frogs, newts, lizards and tortoises brought from the south, and also across the Mediterranean

(Continued on page 72)

BREEDING AND REARING THE GIANT DANIO

By W. J. CHRISTIAN and W. C. WEBLEY *(Scientific Group of the Nottingham Aquarists Society)*

OUR first efforts to breed this fish were made early this year and were attended with such good results that we feel that many other aquarists will be interested to know of our experiences.

The adult fish used were about nine months old and were duly separated and conditioned separately on as much live food as could be obtained thus early in the year; when the female was observed to be heavy with spawn, the breeding tank was prepared. This was 30 × 12 × 15 ins. deep, the water level was reduced to six inches and the centre of the tank for its entire length was very heavily planted with Cabomba and Ambulia, a clear space of some two to three inches being left at the front and rear of the tank to facilitate the removal of the breeders on completion of spawning, it being well known that these fish are fast swimming and somewhat difficult to catch. The tank was maintained at a temperature of 75°-80° and the water was in an alkaline condition. The tank now being ready the breeders were introduced in darkness on the night of March 7th, the tank then being completely covered. The covering was removed early next morning and the pair were observed to be driving almost immediately, eggs were observed, very few at first but as the driving went on the numbers increased. The spawning lasted approximately four hours, at the end of which time the breeding pair were removed. By the 9th March fry were observed to be hatching out and later this day some 150 were counted hanging to the front glass; the plants also were literally festooned with them. By the 11th the majority were free swimming, with a jerky motion. This was obviously a very large brood and now the problem was to raise them.

It is not an uncommon experience to hear of large spawnings and hatchings followed usually by considerable losses. We are of the opinion that many of these losses could be prevented were adequate arrangements made to ensure copious supplies of food continuously in the early days. This matter had been very fully discussed by the writers previously and we felt that here was a grand opportunity to put our theories to the test. We had been experimenting in an effort to find a foolproof method of continuously feeding infusoria and the conclusion had been reached that one of the best methods we could see was to use an air lift in conjunction with our aeration pump.

A number of 7 lb. jam jars were used to produce the cultures in, the medium used being fresh lettuce and raw potato; in addition a proprietary infusoria medium was also tried. It was found that the lettuce gave a culture of mainly fine infusoria which was ideal to start these fry on, and the potato and the proprietary infusoria medium gave mainly *Paramecium*.

With this brood the continuous feeding of the infusoria was commenced as soon as hatching was complete and was continued night and day for two weeks. While infusoria was being fed the tank was aerated; this, we found, had the effect of quickly spreading the drips over the tank and this, we feel, was responsible for the lack of considerable disparity in size in such a large brood; normally one would expect to get some considerable size disparity. When hatched these fish were about ¼ of an inch long, but with good feeding and aeration growth is extremely rapid, in fact one can almost see the fry grow. At a week old Micro was added to the infusoria feeding, at two weeks old infusoria feeding was discontinued and cyclops and small daphnia were fed in addition to Micro. From now on growth was amazing and at three weeks old additional tank accommodation had to be provided. The brood were therefore accommodated in two 30 in. tanks; on April 5th they were again split up into four 30 in. tanks, it being estimated that there were about 400-500 fish in this brood. Growth continued to be good and at time of writing they are now six weeks old and are on average about an inch and a quarter body length. At three weeks the tail and shoulder markings appear, the lateral stripes appearing later.

We would predict that, due to the ease in spawning, in future this variety should not be as short in supply as it has been in the past.

A coloured plate of the Giant Danio (*Danio malabaricus*) will be given with the next issue—Ed.

PARISIAN HOLIDAY *(Continued from page 71)*

from N. Africa. The spring and early summer are good times to buy. Few animals benefit from long sojourn in the average pet store. Sometimes there are a few N. American tortoises as well.

Stocks of tropicals change from time to time but lately there have been *Nannostomus marginatus*, *Hyphessobrycon heterorhabdus* (Ulreyi) and *Aphyosemion australe* (Kap Lopez), all French bred, and in fair supply. The aquarium plants are worth some attention too. Altogether you can be sure of much interest and entertainment.

Many aquarists in Paris enjoy the advantages of constant and efficient aeration of their tanks without the bother of a pump and its maintenance. How is it done ? Well, the underground railway, the Metro, runs compressed air mains along with the usual street supplies of water, gas and electricity, and if you are along the routes of this underground system you have the air laid on just like the other services and your aeration problem is permanently and cheaply solved.

Well, Happy Holiday and Good Hunting !

NEWTS

by IRIS MURRAY

with photographs by LIONEL E. DAY

ALTHOUGH there are three species of newts to be found in the British Isles, the two which are most common are the Great Warty Newt (*Triturus palustris*), Figs. 1 and 2, and the Common or Smooth Newt (*Triturus vulgaris*), Figs. 3 and 4. As is the case with all amphibians, they spend most of their lives on land, and only return to the water during the breeding season.

Generally speaking, their legs are used as a means of transport while on land, and they swim by an undulatory movement of the tail. To offer less resistance to the water, they tuck their legs up against the under side of the body, and point them towards the tail.

They are to be found in almost any pond or ditch during the spring and early summer, but leave the water to find their winter hiding places on land in the autumn. It is during their stay in the water that they become most active, and flaunt their most vivid colours. At other times of the year they are to be found hiding under stones, or in crevices of walls, seldom showing themselves during the day, but coming out at night to hunt for food.

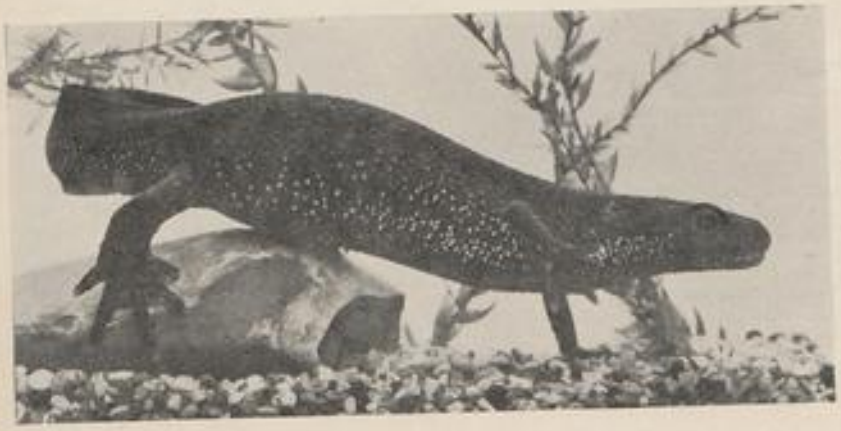
It is because of this sluggishness that they once received the generic name of Molge, derived from the Greek word meaning slow.

The metamorphosis of the tadpole is very similar to that of the toad and frog except that the tadpole takes six months before it can leave the water in the adult stage, and it does not breed until the spring of the fourth year.

The skin is soft and moist like that of a frog, and

Great Warty Newt
(*Triturus palustris*)

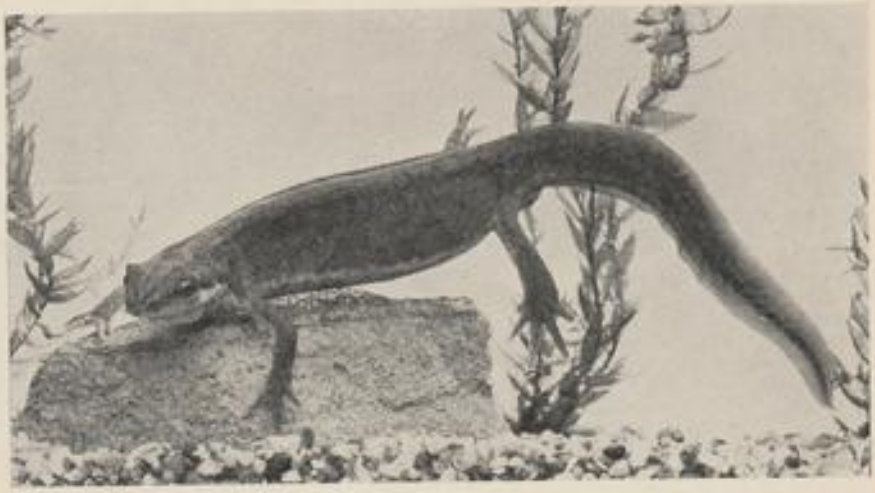
Male



Female

Smooth Newt
(*Triturus vulgaris*)

Male



Female

the newt has prominent eye-balls, which retract into the roof of the skull. They breathe by a force-pump action of the mouth and throat, and also through the skin, while the tubercules on the skin are supposed to exude a certain fluid which keeps the outer skin of the newt moist when it is some distance from the water.

Contact with a newt has been thought to be poisonous. This is entirely erroneous, although the skin does manufacture a very unpalatable secretion as a protection against potential enemies. A similar action occurs in the toad.

The male newt of both species develops a crest down the length of its back during the breeding season, but as the autumn approaches this is absorbed, and so disappears from view.

Until they are full grown newts shed their top skin a number of times, sometimes as often as once every ten days. This is a kind of moult, but is known as a slough. The newt starts by loosening the skin round the neck, and pushes it down its body with its forelegs. This procedure is aided by rubbing against weeds and stones, and the skin is finally pushed off the end of the tail by the back legs. The skin is perfect in every detail, even to the toes, and is so thin that quite often it remains in suspension in the water, very often to be eaten by its late occupant. As soon as it is removed from the water it becomes shapeless. Just before a slough the newt becomes particularly sluggish, and loses its appetite. Normally its main food consists of small insects, larvae and worms when it is living on land. An interesting feature of these creatures is that they have the power to replace lost limbs.

The same procedure takes place in the lobster, and if it is a leg which has been lost the new member

is perfect from the start of the growth.

The female takes three to four days to lay her eggs, usually, simply, on the leaves of various aquatic plants such as Crowfoot, Vernal Starwort or Arrowhead.

The eggs are fertilised internally, and the female takes a great deal of trouble to choose a suitable leaf on which to deposit the egg. She lays it on the leaf and then folds the edges over in order to protect it, and the egg adheres by means of the glutinous substance surrounding it. If there happens to be no suitable leaves or plants in the pond the eggs will be found under stones.

Under favourable conditions the young tadpoles will be free of the egg in 12 to 15 days, but this depends largely on light and temperature, as does the growth of the tadpole. Food will also hasten or retard its development. In seven days the head and tail can be distinguished, and very shortly after the branchiae appear. The tadpole changes its position in the egg sac, and the flow of blood can be observed through a microscope. As the young tadpole leaves the sac so the latter collapses.

There are a few peculiarities to be noted about the newt tadpole in comparison with that of the frog or toad. The claspers and external gills are longer in the newt, its tail remains permanent, and the forelegs appear before the hind pair. The gills are absorbed shortly after the appearance of the hind legs, and then the young newt is obliged to come to the surface for gulps of air, making a popping noise while so doing. The eyes are a brilliant amber, and the claspers disappear as the forelegs develop. Once the adult stage has been reached the newt leaves the water, and does not return until the spring of the fourth year to breed. During this time it lives in shady corners or under stones, and feeds on worms and other insects.

Although the life-cycles of all the newts are similar, each species has some peculiarities of its own.

The Great Warty Newt (*Triturus palustris*) is so called because of its rough skin and its size. It is our largest species, and when fully grown measures from five to six inches, only growing about an inch during each year.

The back is almost black, but the underside is bright orange with irregular black markings. The sexes are difficult to distinguish, except as they reach maturity, and the breeding season approaches. Then the skin becomes rougher, the colours become brighter, and the notched crest develops down the centre back of the male, while the light stripes on the sides of the tail become a silver blue.

Although it has been established that most newts do not return to the water until the fourth year, *palustris* is an exception to this rule and will return each summer. Sometimes during the winter several will huddle together in one hole or crevice.

It is most commonly found in ponds and ditches around large towns, or even in the suburbs, and is distributed over a wide area.

The most common of the British newts is the Common or Smooth Newt (*Triturus vulgaris*). This is found everywhere in the British Isles, and is about four inches long when fully grown.

Its skin is smooth and varies in colour from yellow to green and brown, being spotted with a darker colour. These spots are darker and more numerous in the male, and the under-side is yellow; in common with the whole genus the yellow turns to bright orange as the breeding season approaches.

The toes are slightly fringed in both sexes, but it is almost imperceptible in the female, while in the male the fringe disappears when the crest is absorbed in the autumn.

These amphibians adapt themselves quite readily to an aquarium, providing it is kept covered, and an island of some sort is provided. They appear to have a certain amount of intelligence, and take quite an interest in their surroundings, both in the water and outside.

MYSTERIOUS EELS

THE majority of educated people interested in natural history to-day know that eels have a common spawning ground deep down in the Atlantic Ocean, somewhere not far south of Bermuda.

For centuries, however, the reproductive process of eels was a mystery, and many stupid notions were passed down the ages concerning spawning habits. Probably Aristotle began it all by asserting that eels had never been found with milt or roe, and that they had no reproductive organs. A little later, Pliny the Elder advanced the theory that eels reproduced their kind by rubbing themselves against rocks, the bits of flesh which flaked off becoming new eels. The Romans considered Jupiter and the goddess Augusta were the parents of the fish! To-day, there are still a few country people who believe that if a horse-hair is left soaking in pond water for about nine days it will turn into an eel. One of the quaintest theories ever advanced was that of a German zoologist who maintained that the dews of May mornings gave birth to eels.

J. H.

A COLLAPSIBLE SPAWNING POND

For those to whom, for various reasons, a permanent pond or large aquarium for outdoor breeding is impracticable, the following method can be used at a comparatively low cost. Ex-R.A.F. inflatable rubber dinghies (one-man type or otherwise) are available at various stores throughout the country, their price comparing favourably with glazed aquaria of similar dimensions. The dinghy can be inflated and set up about one week before spawning, and removed to storage immediately after hatching. It is an advantage to construct a small wooden frame upon which the dinghy can rest tilted at an angle to provide shallow water, although this is not essential. Although cats will find difficulty in catching fish, especially if the container is only partly filled, a cover of wire netting is advisable, and this can be easily attached to the metal rings on the sides of the dinghy, thus affording a sure protection.

G. J. LEWINGTON

THE BARKING FISH EXHIBITION

EAST London Aquarists are to be complimented upon this year's edition of their exhibition, which showed considerable improvement upon the previous one. The staging and lighting were more attractive and better arranged, while the general level of the exhibits was much higher. The show was open for two days (May 21st and 22nd) and attracted a large crowd, including many visitors from distant parts of London and the suburbs. On the Friday, the Mayor of Barking (Alderman Mrs. Martin, J.P.) opened the exhibition after a short ceremony at which Mr. M. Lazarus (Chairman) presided, supported by Mr. T. E. Burt (General Secretary) and other officers.

The President, Mr. W. P. Bradley, welcoming the Mayor, made a survey of the hobby and the work of the Society in his usual thoughtful and painstaking manner, and it was a pity that the stewards were unable to keep newcomers at the back of the hall silent for this short time. Mr. Bradley's speech is printed below. In opening the exhibition, the Mayor expressed her pleasure that special efforts were being made to interest children in the hobby. Councillor Howe, organiser of the show, proposed thanks to her, and Miss Joan Taylor presented a bouquet on behalf of the Association.

The great majority of the entries were those of members of the Association, but this year for the first time there were classes open to other clubs. Judging was by Messrs. Creed, Fraser-Brunner, Mealand and Lazarus.

As usual nowadays, the Goldfish classes were the weak spot, the best being Mr. E. Cole's shubunkin, a well-shaped and handsomely marked fish, though lacking sufficient blue. Space does not permit a full review of the tropicals, the outstanding fish being those which took the "specials" listed below. We were glad to see some good quality Guppies, and it was a shoal of these which pulled their weight in the winning open class tropical furnished aquarium—the most beautiful tank we have seen for some time—entered by the Dagenham Aquarists' Society. The keynote was struck by rocks of a pleasant pinkish shade, and the compost was made by crushing the same rock. Plants were really green, healthy and well planted, and the shoal of good quality male Guppies gave just the right touch of colour and movement. The fish were not all of the same strain, and we were glad to notice some speartails, a variety that should be encouraged, as it is getting scarce. Classes we were glad to see were those for plants, well supported with some handsome entries. This example should be followed at all shows, for plants are as important as fish in aquaria.

LIST OF AWARDS

Class 1—A. V. Guppy M. 1, Mrs. Stanley; 2, Mr. J. Looker; 3, Mr. W. Myers; 4, Mr. A. Lanceman. **Class 2—A.V. Platy M.** 1, Mr. Lanceman; 2, Mr. B. Newman; 3, Mr. H. Rooney; 4, Mr. D. Johnson. **Class 3—A.V. Molly P.** 2, Mr. J. Evans; 3, Mr. C. Ward; 4, Mr. H. White. **Class 4—A.V. Molly M.** 2, Mr. B. Howe; 3, Mr. C. Looker; 4, Mr. D. Johnson. **Class 5—A.V. Swordtail P.** 2, Mr. J. Evans; 3, Mr. C. Ward; 4, Mr. A. Cooper. **Class 6—A.V. Swordtail M.** 1, Mr. D. Johnson; 2, Mr. Rooney; 3, Mr. I. Cooper; 4, Mr. J. Evans; V.H.C., Mr. R. Johnson. **Class 7—A.O.V. Livebearer.** 2, Mrs. Stanley; 3, Mr. A. Holloway. **Class 8—A.V. Characin P.** 1, Mr. C. Looker; 2, Mr. D. Johnson; 3, Mr. A. Lanceman. **Class 9—A.V. Characins S.** 1, Mr. E. Cole; 2, Mr. Rooney; 3, Mr. T. Cousens; 4, Mr. T. Cousens. **Class 10—A.V. Barb S.** 1, Mr. C. Looker; 2, Sister Smith; 3, Mr. Stanley; 4, Mr. C. Ward; V.H.C., Sister Smith. **Class 11—A.V. Danio or Rasbora.** 1, Mr. E. Cole; 2, Mr. E. Cole; 3, Mr. I. Cooper; 4, Mr. D. Johnson. **Class 12—A.V. Cichlid.** 1, Mr. A. Lanceman; 2, Mr. B. Newman; 3, Mr. A. Duckett. **Class 13—A.V. Catfish.** 1, Mr. E. Cole; 2, Mr. M. Lazarus; 3, Mr. A. Lanceman. **Class 14—A.O.V. Egglayer.** 1, Mr. C. Looker; 2, Mr. C. Looker; 3, Mr. H. White. **Class 15—A.V. Fighter S.** 1, Mr. R. Johnson; 2, Mr. C. Ward; 3, Mr. R. Johnson. **Class 16—A.V. Gourami S.** 1, Mr. E. Wright; 2, Mr. A. Duckett; 3, Mr. J. Myers; 4, Mr. J. Evans; V.H.C., Mr. H. White. **Class 17—A.V. Paradise.** 1, Mr. D. Chewwright; 2, Mr. A. Holloway; 3, Mr. J. Myers. **Class 18—A.V. Livebearers (Breeders).** 1, Mr. P. Campkin; 2, Mrs. Stanley; 3, Mr. D. Johnson; 4, Mr. D. Johnson; 5, Mr. E. Cole. **Class 19—A.V. Egglayer (Breeders).** 1, Mr. E. Cole; 2, Mr. A. Lanceman; 3, Mr. E. Cole; 4, Mr. C. Looker. **Class 20—A.V. Labyrinth (Breeders).** 1, Mr. P. Campkin; 2, Mr. J. Evans; 3, Mr. A. Lanceman; V.H.C., Mr. P. Campkin. **Class 21—Common Goldfish.** 1, Mr. F. Grimble; 2, Mr. B. Howe. **Class 22—Shubunkins.** 1, Mr. E. Cole; 2, Mr. A. Ford; 3, Mr. A. Ford; 4, Mr. J. Myers. **Class 23—A.O.V. Fancy Goldfish.** 1, Mr. J. Bonsor; 2, Mr. A. Holloway; 3, Mr. S. Lee. **Class 24—Cold Dom: Fish 5 in. limit.** 2, Mr. H. White. **Class 25—Goldfish over 5 in.** 1, Mr. J. Bonsor; 2, Mr. J. Bonsor; 3, Mr. J. Bonsor. **Class 26—A.O.V. Cold Water Fish, over 5 in.** 2, Mr. Cooper. **Class 27—Goldfish (Breeders).** 1, Mr. E. Cole; 2, Mr. Ford; 3, Mr. E. Cole. **Class 28—Furnished Aquaria Tropical.** 1, Mr. Lanceman; 2, Mr. D. Johnson; 3, Mr. C. Looker. **Class 29—Furnished Aquaria Tropical (Junior).** 1, Mr. A. Lanceman; 2, Mr. D. Johnson; 3, Mr. C. Looker. **Class 30—Furnished Aquaria Cold Water.** 1, Mr. A. Duckett; 3, Mr. C. Looker. **Class 32—Furnished Aquaria, Open Class Clubs.** 1, Dagenham; 2, East London; 3, Benhurst; 4, Manor Junior. **Class 33—Large Plants.** 1, Mr. A. Cooper; 2, Mr. P. Campkin; 3, Mr. P. Campkin; 4, Mr. Looker; V.H.C., Mr. Lanceman. **Class 34—Small Plants.** 1, Mr. D. Johnson; 2, Mr. C. Looker; 3, Mr. D. Johnson; 4, Mr. Lanceman; V.H.C., Mr. Campkin. **Open Class I—A.V. Guppy—M.** 1, W. Myers; 2, Mrs. R. Aldred; 3, W. Myers; 4, W. Myers. **Open Class II—A.V. Platy—P.** 1, Mr. Day; 2, Mr. D. Johnson; 3, Mr. J. Evans. **Open Class III—A.V. Molly P.** 2, Mr. A. Richardson; 4, Mrs. R. Aldred. **Open Class IV—A.V. Swordtail P.** 1, C. Looker; 2, Mr. Day; 3, Mrs. R. Aldred; 4, H. White. **Open Class V—A.V. Fighter M.** 1, H. White; 2, Mrs. R. Aldred. **Open Class VI—Shubunkins.** 1, 2, 3, Mr. Hammerton. **Open Class VII—A.O.V. Fancy Goldfish.** 1, 2, 3, Mr. Day.

(Photo: C. W. Creed)

Judging in progress on the great array of exhibits, only a small part of which is shown here

CUPS

"Creedo" Cup—D. Johnson; **"Gill" Cup**—J. Looker; **"Coldwater" Cup**—C. Cole.

Specials

Best Guppy in show	Mrs. Stanley
" A.O.V. Livebearer in show	Mr. D. Johnson (Swordtail)
" Egglayer in show	Mr. C. Looker (Barbs)
" Cichlid " "	Mr. A. Lanceman (Blue Acara)
" Labyrinth in show	Mr. R. Johnson (Fighter)
" Fancy Goldfish in show	Mr. E. Cole (Shubunkin)
" Furnished Aquaria in show	Mr. A. Duckett (Coldwater)
" Plant in show	Mr. D. Johnson (Twisted Vallis)
" Juniors Fish in show	Mr. J. Looker (Guppy)
" Tropical Fish in show	Mrs. Stanley (Guppy)

PROGRESS REPORT

Mr. W. P. BRADLEY'S SPEECH AT THE OPENING OF THE BARKING FISH EXHIBITION

Our Association is mightily encouraged by our Mayor's gracious support in consenting to open our Show and by the interest shown by her in our club activities and in those precious, allurring jewels of Nature which we have been instrumental in rescuing so far from their sun-bathed pools and streams in the tropics, under the industrial haze of East London.

This Exhibition is the largest ever staged by us. There are some 260 entries against a previous high of 200 or just over, while our annual shows throughout our years of existence have always shown a steady increase.

This year, for the first time, I believe, we have classes open to members of other clubs; there are eight open classes and we have received 36 entries—this large number is certainly a compliment and greatly appreciated.

I am glad to see an increase in that class so enjoyed by the general public—" the Furnished Aquaria "—we have 14 entries this year ; one before the war we could muster only 4. These living pictures of a jungle pool in the sitting-room attract many curious lovers to our hobby—while not only fish but plants and the owners' skill and taste in arrangement are entered for judgment.

Throughout the country the hobby is steadily increasing its devotees, new clubs are forming each month, and the Federation of British Aquatic Societies has been most helpful and sympathetic towards them whenever help or advice has been asked for.

Our own membership is steadily increasing and we now have 207 members of which 18 are juveniles, a round figure for us, and I think we must possess one of the largest club memberships in the hobby.

However, we do not measure our size by a show of hands only, a show of hearts is a better measure—it is the good friendship and the quality in our attitude towards our hobby which makes a club as great—and in this respect I am thankful to say the East London has always been well founded and wisely led. A happy and generous fellowship existing amongst our members is the finest solution to the hobby that we can stage.

A very satisfactory development in our Association is the desire among members to specialise in the kind of fish they keep, to learn as much as possible about one or two species or varieties, to concentrate on the production of a few fish of superb quality—and all this in the pleasant company of those similarly inclined, and anxious to share one with another their experience and knowledge on the same subject. To facilitate this, the Association has formed " Study Groups," whereby those interested on the same subject may get together at their own homes for this purpose.

The experience, with and careful recording of these Study Groups will be of the greatest value to the hobby as a whole.

We can hope that our example may lead to more discernment in breeding in the hobby in general and to a final elimination of those masses of undistinctive young fish, bred by those who have little knowledge of controlling their productions, with a result that the market is in danger of being loaded with these valueless inferior fish to be passed on in turn for further breeding by the new owners.

It is a great pity that the Federation's scheme for controlling the importation of new fish into this country was not effectively adopted by the Board of Trade. As it is we have very costly and rare fish being imported, which generally go to the enthusiast with a long purse and little knowledge of breeding and consequently are soon lost, while the less profitable first-class specimens of the fish we can breed, and which are so badly needed to new blood in the breeders' tanks, are rarely seen.

If importation was controlled by those who have the welfare of the hobby at heart, the fish of the kind most needed would go to the men of those best able to multiply them and we should soon find ourselves in a position to offer foreign markets our own superb creatures.

There is a tendency among many of us nowadays to take our finny friends for granted.

The aquarium presented to the children's ward in St. Mary's Hospital, Plaistow, is still maintaining its charm for the young-sters and the one more recently placed in our clinic is still a source of interest and appreciation.

I cannot close without calling your attention to the educational influence imparted to children in the home where our hobby is established. Naturally in love with any pet, they are readily interested in anything affecting its welfare, and so in households where the problems of aquatic life are of general interest subjects relative to our hobby such as geography, dietetics, genetics, plant life and its mechanism, elementary bio-chemistry, pond life and the wonders shown by the microscope, can all be introduced in such a manner that the child, from its earliest days, develops an appreciation which later on may lead to the development of a cultured mind and a life full of interest in things worth while.

I am sure you will all cordially support me when I take this opportunity of expressing our appreciation to the Show organiser, Mr. Howe, and the Show Secretary, Mr. Myers and to each member of the Committee, who have given so much time and labour to make this Exhibition a success.

(Photo : C. W. Creed)

The world's smallest aquarium was a special exhibit at the Barking Fish Exhibition. Made entirely of perspex, it carried its own illumination under the cover, and was artistically furnished with living plants and active fishes (newly-born Guppies). The size can be gauged by the penny stood against it. It was made by Mr. D. Johnson.

WATER-POWERED AIR PUMPS

By W. H. MACEY

WATER-powered air pumps are very reliable, perfectly silent in action, powerful where height is available, simple to construct, compact, and operate without running expenses.

Power is governed by the length of the air-trap tube, plus the rate of drip. The pump shown with its 8 ft. ceiling height, and the air-trap box attached, will operate up to half a dozen diffusers to a depth of 12 ins. or more, using a slow (one drop per second) to a fast rate of drip. Regulated for one drop to fall every five seconds will produce sufficient power to aerate a large aquarium (i.e., cause the " Spray " diffuser, described in last month's issue of *The Aquarist*, to emit half a dozen sprays of very fine bubbles). At this rate of drip, a gallon of water used for power, will last over a week. Regulated for one drop to fall every 10, 20, or 30 seconds, will produce 3, 2, or a single spray of bubbles. Sufficient to aerate small aquaria, or work a filter. Using stone diffusers with a slow rate of drip, the bubbles are emitted in salvos, giving rather an unusual effect.

The Pump.—This consists of a small " golden syrup " glass jar, with a metal screw top cover, 3 ins. square and 3½ ins. tall, but any screw top jar will do, large enough to hold the fittings, preferably one with a bakelite cover. If the jar is tall, the fitting can be arranged for it to operate lying on its side. Three holes are made through the cover, spaced at the corners of an imaginary triangle half an inch from the edge of the cover. They should be large enough to receive valve barrels from discarded inner tubes of cycle tyres, by drilling a small hole and enlarging it with the butt end of a file. Working from the inside of the cover and filing off the ridge as it forms on the outside. With bakelite work on both sides of the cover with the butt of the file, after drilling the small hole. Tubing can, of course, be soldered direct through the cover, but this means a treble soldering joint and it is not so strong. The slotted portion at the top of the barrels is cut off, each barrel fitted with a rubber washer for use on the inside of the cover, while its own metal washer is used on the outside. One barrel, the inlet, has its threads filed down smooth half its length for the air-trap tube to be connected. Another, the water outlet, has a small size tube passed through it, soldered, making an airtight joint, and bent to shape as shown. The third barrel, the air outlet, has a small tube soldered as shown, or its threads filed smooth as for the inlet. The float is a large cork bottle stopper with a length of small size tube passed through it and bent at right angles. The upper end of this tube is closed by flattening it out with a hammer to prevent air passing through. A piece of thick walled rubber tubing, at least an inch long with a sharp cut made central on the under side, just deep enough to reach the bore, connects the float to the water outlet. The cover is made airtight by using a liberal supply of thick grease on the threads inside the cover, and also on the jar, so that when the cover is finally screwed up, the rim of the jar is embedded in the grease. The jar can be tested for airtightness, either before use or when in action by placing it in a bucket of water.

The air-trap tube.—This should be as long as possible for every inch added increases the power of the pump and saves a considerable quantity of water. The tubing should have a $\frac{1}{4}$th inch bore, or not larger than $\frac{5}{16}$th, nor smaller than $\frac{7}{32}$th, if the pump is to operate at all speeds. That is, from " Dead Slow " to " Full Speed." Glass or metal tubing preferred, but rubber tubing may do if supported. Tubing larger than $\frac{5}{16}$th will hold the bubbles with a fast rate of drip, but they fail with the slower speed, allowing the bubbles to " slip," with the water running down the inside of the tube, reducing the power of the pump considerably. Smaller tubing than $\frac{7}{32}$th hesitates to increase the power of the pump when the rate of drip is advanced, causing a slight overflow in the air-trap box. Also small tubing will not restart a pump until the pressure in the jar has been released.

The air-trap box.—A small hole in the apex of the supply tube, near the ceiling, or a small funnel packed with a piece of sponge or wool will trap air at a fast rate of drip, but like the air-trap tube it fails at the slower speed. The air-trap box will trap air at all speeds, even at one drop per minute, and it is not a difficult thing to make. A 2 inch length of $\frac{1}{2}$ inch metal tubing filed away on either side to form observation holes (spy holes), and fitted with two wooden stoppers. The upper stopper holding the supply tube while the lower holds a short tube belled out at the top, or the hole in the stopper countersunk to form a small funnel. It is essential that the box should hang vertical for the drop to fall directly into the funnel, and the distance for the drop to fall is $\frac{1}{8}$th of an inch.

Where a can of water is used for power, it should be fixed as high as possible and fitted as suggested. A syphon and a gauge connected to the twin arms of a two-way air connector, with the centre arm inserted into the upper stopper of the air-trap box. The syphon remains full, the gauge shows at a glance the amount of water in the can, and the connector makes a good regulator.

To action.—With the air-trap tube connected to the inlet, the diffuser lead to the air-outlet, and a short rubber tube connected to the water outlet and led away to waste; the water and air from the air-trap tube enters the jar, the air is immediately forced through the air outlet, due to the weight of the float closing the cut in the rubber tubing. The water in the jar rises until the float has sufficient bouyancy to open the cut, then the water is forced through the water outlet. The tube attached to the water outlet should be kept low, for every inch added to its height reduces the power of the pump.

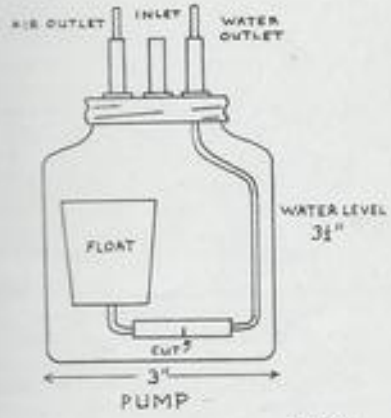
NOTES

Two-way air connectors are sold by our dealers.

Small metal tubing, car petrol pipes, obtainable at a garage.

Thick walled rubber tubing sold by cycle and car dealers, used for operating windscreen wipers.

Bakelite tubing, a shaving soap holder fitted with valve barrels and small metal tubing, a 2 inch length of garden hose, or a piece of hard wood, all make successful air-trap boxes.



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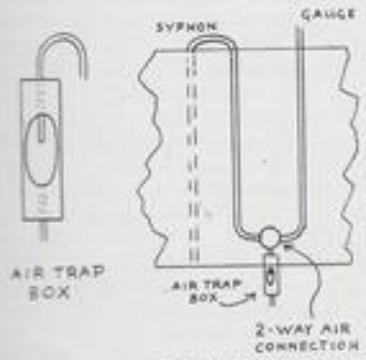

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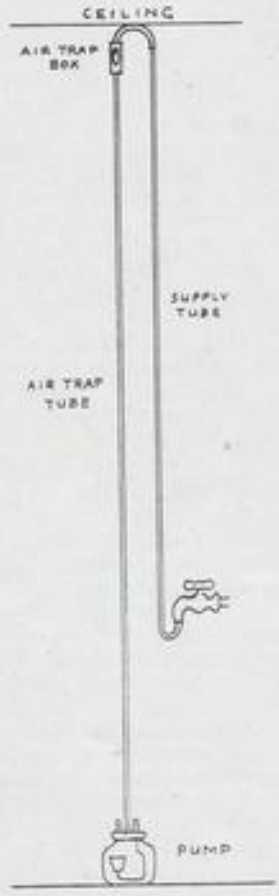


THE PUMP COMPLETE

MARINE AQUARIA

By
A. J. CLAXTON

(Photo: B. H. Tait)

General view of a three-foot tank

Introduction

THE thought of keeping marine life conjures up in the minds of most people all sorts of insurmountable difficulties due to the lack of general information. This is a great pity as it probably prevents the average aquarist appreciating the beauty and intrigue of sea life. The beauty for instance of a tank devoted solely to species of anemones is shown by the accompanying photographs. In the following the author hopes to dispel any fears of failure when keeping marine life, providing " common sense " precautions are taken and one is prepared to devote slightly more time to their maintenance than if fresh-water aquaria are kept.

" Setting up " the Aquaria

Assuming the method of " setting up " the aquarium is similar to that described previously (1), the following suggestions for covering the tank bottom will assist those who are contemplating setting up a marine aquarium. For active crustacea which disturb artistically placed rocks and shells a layer of large bluestone chips or similar material and coarse sand are found decorative, and the inmates are always visible. If a tank is solely devoted to anemones one can introduce jagged rocks or even coral, which, as the photographs show has been used. This looks extremely attractive and eliminates the " flatness " that may otherwise predominate Hydroids have also been used to enhance the general appearance. If an aquarium is completely devoted to fish one must avoid jagged rocks ; and since many varieties of fish like to cover themselves completely or partially with sand, it is essential that the bottom of such an aquarium should be so covered.

It has been found advantageous when setting up a large aquarium (i.e., 48 × 18 × 18 ins.) of this nature, to use a few large rocks or stones in preference to several small ones. Finally a few suggestions which cover most aquaria. All tanks must be completely covered with glass to prevent the loss of crabs, shrimps, etc. As practically all sea weeds die and pollute an aquarium it will be found useful to use hydroids or colonies of coralline weeds for decorative effects.

As stated in the previous article the majority of the author's aquaria are the normal angle iron, slate bottomed type. These tanks have been " set up " for over a year now and the author has found that their composition has in no way had any detrimental effect upon the fauna kept. After it had been " set up " for a week one 24 × 12 × 12 in. tank developed a slight leak. This was sealed while the tank remained full of water by the application of Bostik C glazing compound and after it had dried it was painted with several coats of Presomet bituminous paint. Apart from this slight exception the salt water seems to have had no effect on the metal frames, and the importance of the application of Bostik and a bituminous paint as already described, before the salt water is introduced, cannot be over-emphasised. It should be borne in mind that the tanks used had been used previously for many years as freshwater aquaria and the author feels the leak was not caused by the salt water. As soon as a speck of rust appears on any part of the metal-work of a tank, especially the underside of the top rim, immediately dry the part concerned, and paint over it with the paint previously mentioned. If care is taken of an angle iron tank in this way the author considers, after a year's test, that a tank of this

nature is far superior to an all-glass type which is usually slightly opaque. Moreover large all-glass tanks are impossible to procure.

Aeration

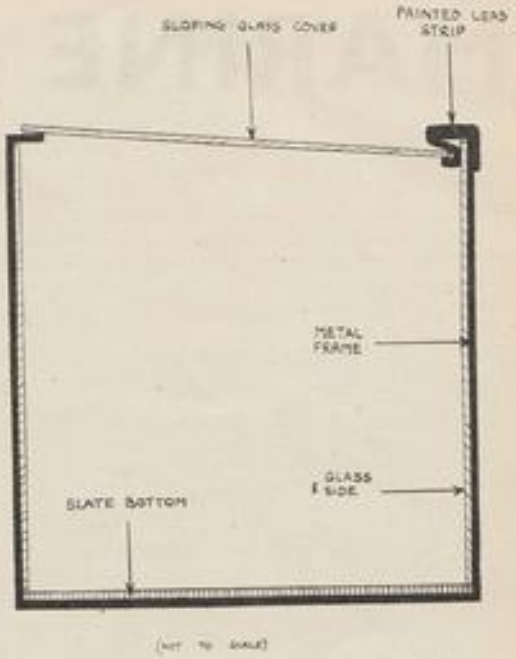
Ample aeration of seawater cannot be overstressed. During the summer the temperature of the water in the aquaria ranged for weeks from 70° to 80° F., which needless to say is a very critical temperature for marine fauna to experience, as the higher the temperature of the water the less oxygen it can dissolve. It was found that with ample aeration, anemones, star-fishes, common, edible, and hermit crabs, winkles, sand gobies and shrimps stood the highest temperature reached, being some 82° F. Whelks, and butterfish stood temperatures up to 75° F. Prawns, plaice, rock gobies and two species of wrasse were introduced after the hottest weather, but survived temperatures of 74° F.

The fact that in a 24×12×12 ins. aquarium 60 anemones of various species thrived and reproduced at temperatures up to 82° F. is most gratifying. However during very hot weather the Plumose anemones (Metridium senile) closed up. Some of these anemones had been in the aquarium well over a year. The excessive aeration compared with that used for fresh-water aquaria was only applied for at the most, 8 hours in 24, except for four days when outside temperatures were high, when it was maintained for eleven hours.

There were so many anemones in one tank that after feeding on scraps of mussel it was noted that the water always became slightly milky. It was thought that this was due to uneaten scraps fouling the water. On many occasions the anemones were most carefully fed and no scraps were left uneaten, and still this milkiness occurred. It is assumed that it is caused by the actual digestion of the scraps of mussel by so many anemones; but with ample aeration always disappeared after three days, when the water once more became crystal clear.

Always make sure that the aeration pipe line contains as much glass tubing as possible, only using rubber tubing at the joints and even so make sure that the joints are glass to glass or glass to " T " piece or valve. Where possible use thick walled rubber tubing. It is also advisable to paint all metal " T " pieces and valves.

Any spray from the aeration will soon perish rubber tubing and corrode metal. With ample aeration the spray hits the glass covers of the aquaria and runs onto the top metal rim of the tanks. To prevent this the glass should be inclined by resting one edge of it on strips of painted lead bent in the shape shown in the diagram. These



(not to scale)

strips of lead clip on to the top rim of the tank.

Hydrogen Ion Concentration

The following observations and results of experiments concerning the hydrogen ion concentration of sea water may in some ways cause the amateur to hesitate in setting up an aquarium. It should be emphasized that the control of the pH value of sea water in aquaria is extremely important, but only advocated for the more scientifically minded aquarist who maintains more than a few aquaria. For a keen aquarist who intends setting up a 24×12×12 ins. or say two smaller aquaria the " sweetness " of the water can generally be ascertained by its clarity, " sparkle " and typical " sea smell " devoid of foul odours.

Random samples of water from various aquaria were taken and it was found that in all the aquaria of the circuit the hydrogen ion concentration ranged from pH 7.13 to 7.80, thus confirming the previous results (1). The reaction of the foul water in the filter tanks caused by the development of bacteria was pH 6.54. It is evident that should the reaction of the aquarium water fall below about pH 7.00 (neutrality) one must suspect fouling of the water and should it fall still further to pH 6.50, death of the fauna will possibly result. While collecting fauna from the sea shore samples of sea water were taken. The reaction of these samples was as follows.

Date	*Location*	*pH*
21st June, 1947	Hunstanton, Norfolk; as the tide came in ..	7
4th October, 1947	Hunstanton, Norfolk; as the tide came in ..	8.08

The above results are not sufficiently extensive. However it does appear that there is no great variation in the pH value. These results also indicate that the hydrogen ion content of The Wash, from where the sea water was obtained for the aquaria, is higher than the average figure for the aquaria. It was found (1) that the reaction of the sea water fell rapidly from pH 8.19 to pH 7.21 when the aquaria were filled nine days later. The reason for this has not yet been investigated, although this may be due to the more fauna per gallon of sea water in the aquaria compared with the sea, which will also accentuate the drop in the pH value when pollution occurs in the aquaria.

(Photo: R. C. Griffiths)

Numerous anemones in one two-foot tank. Note decorative effect of coral

Filtration

During the very hot weather colonies of bacteria found excellent media in the filter tanks and an ideal temperature. They rapidly developed and appeared as a thick white slime on the sides of the glass, the glass tubes, and on the cotton wool. After cleaning out the filter tanks at frequent intervals and setting them up, using fresh material, the bacteria still developed and were actually introduced into the first tank of the circuit via the glass return pipe. Due to the addition of these bacteria the water in the tank became milky. (This was not the tank in which the milkiness occurred due to large numbers of anemones as already mentioned). With increased aeration the water re-assumed its original clarity. The filtration was stopped, the pipes soaked in Lysol to kill off the bacteria and finally thoroughly washed before setting up again when cooler conditions prevailed. A further stage in the souring of the filters was a change in colour from grey to black, giving off a strong odour.

Stocking

Beware of the following combinations :—

Large Prawns (Leander serratus) attack and devour oppossum shrimps (Mysidacea). Hermit crabs (Eupagurus prideauxi) fight ferociously, so see that if several are kept together they are approximately the same size. They also nip the ends of the arms of the common starfish (Asterias rubens) but are excellent scavengers. Opossum shrimps, small Sand Gobies (Gobius minutus), prawns and common shrimps (Crangon vulgaris), will be eaten by most fish.

Make sure that if several shore crabs (Carcinus maenas) are kept together that they are all approximately the same size. Crabs if kept with anemones often steal their food from out of their mouths, and in so doing may damage their tentacles, so feed the crabs first! Crabs will prise open small common mussels (Mytilus edulis) and eat the fleshy inside. Rock wrasse (Ctenolabrus rupestris) and Corkwing Wrasse (Crenilabrus melops) are quite ferocious and will attack plaice (Pleuronectes platessa) three times their size, also prawns, shrimps and small fish. Rock gobies (Gobius paganellus) and viviparous blennies (Zoarces viviparus) seem quite passive Father lashers (Cottus bubalis) also eat small fish and crustacea.

The author suggests that for those contemplating a marine aquarium a 24 × 12 × 12 tank would include

the following: Beadlet (Actinia equina), Plumose (Metridium senile), Opelet (Anemonia sulcata), Dahlia (Tealia felina) and Daisy (Cereus pedunculatus) anemones, small hermit crabs (Eupagurus prideauxi) small spider crabs (Hyas araneus) and limpets (Patella vulgato). If such an "Anemone" tank is not possible large prawns (Leander serratus) small edible (Cancer pagurus), shore (Carcinus maenas) crabs, swimming (Portunus depurator) and spider crabs (Macropodia longirostris and Hyas araneus) live well together providing the crabs are all about the same size. If an aquarium for fish is proposed, one 24×12×12 ins. will suffice but a large one is better. Hardy fish which will live together (providing there are no extra large ones to devour their smaller brethren) include sand gobies (Gobius minutus) rock gobies (Gobius paganellus) Butterfish (Centronotus gunnellus) Blennies (Zoarces viviparus and Blennius pholis)., three-bearded rockings (Onos tricirratus) and small plaice (Pleuronectes platessa) or flounders (Platichthys flesus). Father lashers (Cottus bubalis), Rock Wrasse (Ctenolabrus rupestris), Ballan Wrasse (Labrus bergylta) and Corkwing Wrasse (Crenilabrus melops) are very beautiful but should not be mixed with most other fish, unless their companions are much larger than themselves. Remember that on the seashore and in the sea there is always a battle for existence shown by the camouflage of the spider crabs and the millions of eggs laid by the herring, to mention only two examples of the thousands of ways this existence is assured). One should watch any addition to one's aquarium after a collecting expedition and separate any ferocious fauna. There are many other fauna one can keep successfully in a marine aquarium but they cannot all be discussed here. However by their general appearance one can usually pick out the wolves from the lambs!

Feeding

Feeding marine life is quite easy. Scraps of fresh mussel (1), cockle (2), tubifex worms (3) chopped earthworms (4), baby shore crabs (5), small shrimps and prawns (6), small live mussels (7), and sand hoppers (8), have all been used. The above have been numbered to assist in the following table which gives the food which each species thrive upon in captivity.

TABLE

Name	*Food*	*Preference*
All Anemones	1, 2, 3, 4, 6, 8	1, 6
Shore Crab (Carcinus maenas)		
Edible ,, (Cancer pagurus)	Dead fresh flesh, ...	1, 2
Hermit ,, (Eupagurus prideauxi)	sea weeds, and 7	
Spider ,, (Hyas araneus) ..		
Common Prawn (Leander serratus)	1, 2, 3, [illegible]	1, 2, 3
Common Shrimp (Crangon vulgaris)		
Opossum Shrimp (Mysidacea)	.. 3	
Common Starfish (Asterias rubens)	.. 1, 2, 3, 7	7
Periwinkles (Littorina littorea)	.. Sea weeds	
Limpet (Patella vulgata)	.. Sea weeds	
Butterfish (Centronotus gunnellus)	.. 1, 2, 3, 6, 8	8
Sand goby (Gobius minutus)	.. 1, 2, 3	3
Rock goby (Gobius paganellus)	1, 2, 3, 4, 6, 8	1
Plaice (Pleuronectes platessa)	.. 1, 2, 3	1
Viviparous Blenny (Zoarces viviparus)	.. 1, 2	1
Father Lasher (Cottus bubalis)	.. 1, 2, 3, 6, 8	1, 8
Rock Wrasse (Ctenolabrus rupestris)	1, 2, 3, 5, 6, 8	5, 6, 8
Corkwing Wrasse (Crenilabrus melops)	.. 1, 2, 3, 5, 6, 8	5, 6, 8

The above has been compiled from actual experience. Most other shore fauna can be easily fed but have not as yet been kept by the author. Anemones should be fed once a week and crustacea and fish sparingly every other day. Make sure any uneaten food is removed. The anemones should be given as much as they will eat. A good test is that when satisfied their tentacles will not readily grasp food. They must be fed individually as already mentioned (1).

References

(1) *The Aquarist*, August 1947, pp. 131-134.

BREEDING THE SCALED FANTAIL

By A. BOARDER

(Continued from the May issue)

IN my article in the May issue I dealt with the treatment of the young fish from hatching until they were about a month old. I will now give a few hints on the subsequent feeding and sorting out the show and breeding fish.

Once the fish are a month old they should be large enough to take a variety of food, and it is beneficial to them if you give a different kind of food at each meal. The times of feeding will depend so much on the temperature of the water. Any warm spell may bring the temperature of the water up in the 70's, and then you will be able to give food more often. Watch how the fish take the food when first introduced. If they immediately come up to the surface and start feeding you can give the usual quantity; that is, enough for them to clear up in a few minutes. If, on the other hand, the fish do not appear eager to take anything at all, do not give any more for an hour or two. It is always advisable to give just a tiny pinch of food at first to see how their appetites are. By giving the fish too much at a time, especially if they are not on the feed, you are asking for trouble, as the uneaten food can soon pollute the water and cause a lot of trouble, probably fungus for one thing.

The fish will appreciate plenty of live food from now on, and chopped small earthworms are ideal for them. It is easy to prepare this food by placing the worms in a small container and then chopping them up with a pair of scissors. If the worms are rather large do not use the dark-coloured head of the worm, as this is very tough. Of course you can still use daphnia if you have enough to spare but I do not think that it is advisable to feed on daphnia alone when the fish have reached this stage. Give them some cereal types of food such as Bemax or the many kindred types which, as you probably know, are just the wheat germ or embryo. Some of the other similar foods are Fortigen, and C.V.B. You can also use rolled oats; and barley flakes are often taken very well. I find that my adult fish are very fond of the latter but of course you will have to mince this food up and screen it before use. The question as to whether to scald or soak the food before feeding to the fish depends a great deal on the size of the fish. If they are still rather small I think that it is advisable to soak the food a little, but once the fish get to about three-quarters of an inch body length, you need not soak the food first. If you mince these dried foods and then sieve them well, you will be able to grade the food into, say, three sizes for different-aged fish. You can also with advantage use packet foods at this time. The kinds sold for tropicals will make a welcome change to the fish but do not feed with the same kind all the time.

If you had raised the temperature of the water for rearing the fry you can now gradually reduce it so that by the time the fish are from six to eight weeks old they may be placed out of doors and so become hardened off before the autumn. There is no need to keep the young scaled fantail as a semi-tropical. It certainly is well to warm the water up slightly for the very young but once they are out of the fry stage they need not be kept so warm. A temperature of 65 degrees is a very good one to aim at, although a variation through several degrees will not hurt the fish but will help to make them hardy. The aim of the breeder should be to harden these fish off so that they will go through the winter out of doors without any trouble. It is surprising how well even fish of an inch body length can go through the winter if they have been gradually brought down to a low temperature by the autumn. I think that it is advisable to place all the fish that you intend to keep outside before the end of September and then you will find that they will have no difficulty in adapting themselves to those conditions. I find that it is a good plan to let the temperature of the water vary a fair amount as this helps to get the fish used to conditions which will prevail out of doors.

Most of my young fish are raised in an unheated greenhouse. Of course the sun heats it up by day, if there is any sun, but the temperature drops at night, and in the early mornings it is only about four degrees higher than the temperature of the water in the pond outside. It will be seen from this that the temperature of the water inside can vary very much from night to day but I find that it does no harm to the young fish. They will keep down fairly low in the water when it is cold but come up near the surface as soon as the sun shines.

Now you will become concerned as to when your fish will begin to change colour. As you are all doubtless aware, the fish are dark greenish-bronze as fry and do not assume the gold colour until the are from three to twelve months old. Many fish of the goldfish types do not change colour at all and others do not do so for two or three years. I have been trying to breed a strain of fantails that will change colour early for a number of years, and am now able to say that I can get them to change by about three months by the right treatment. I do

not mean by this that I could colour any goldfish in that time. I am speaking only of the strain of scaled fantails that I have established. I never breed from any fish which have not completely changed colour by the time that they are a year old, and if they have changed by three months, as often happens, so much the better. It can now be realised why I advocate a fairly small pond in which to breed the fish, as if it were on the large side it is quite possible that some young fish would be hatched in the pond and remain there. If these fish were very slow to change colour or, in fact, did not change at all, it can easily be seen that these fish would eventually breed with the fantails already in the pond, with the result that in time you would rarely breed a single fish that did change colour. This is one of my chief reasons for controlled breeding as against leaving the fish to breed in a haphazard manner in the pond. I know that many breeders have their own pet theories as to how to colour these fish and many think that the colour of the tanks has a lot to do with it. Personally, I think that the whole question of early changing of colour depends on several factors. In the first place I think that it is most important to have a strain which colours early, then you have made a good start and have the necessary factors for a good beginning. Next it will depend on the space, warmth and feeding, as to how soon the fish will change colour.

Let me give an example as to what happened last season with some of my own fish. From a hatching in June, I picked out a team of six youngsters which I hoped to show at a later date. These fish were kept in the greenhouse in a fairly large tank and fed very well. As they had most of the necessary conditions they grew well and by the end of August the same year they had nearly all changed colour. The six fish had changed colour completely by the time that they were three months old, and anyone who knows anything about breeding scaled fantails will tell you that this is rather exceptional. I do not suggest that all my fish change as early as this but I feel certain that I could pick out half a dozen again and by giving them the right treatment could get them to change colour well within six months. Many of my youngsters that get no special treatment will also change when very small, and I have had fully coloured fish when they are only an inch long overall. I cannot say what happens to fish once they leave my possession as so much depends on the subsequent feeding and treatment, but I can say very definitely that all the fish that I keep myself always change colour completely within 12 months.

When the fish are about two months old it is possible to tell whether they will make show fish or not. I find that the best plan to adopt is to place a batch of youngsters in a white bowl. You can then see very easily what type of tail the fish have. The ideal tail is one which is almost completely divided. The show standards specify that the tail or caudal fin should be divided except for one-quarter of its length. I suspect that this proviso was introduced to try to obviate the tendency in some fish to droop the caudal fin too much. Pick out from the bowl all the fish with the correct tails as seen from above and place them in a clear tank. You will now be surprised how the fish you have chosen can vary. The next point to look for is the correct dorsal fin. You will be amazed how these can vary, from well developed ones to those that are so narrow that they appear like the back fin of a shark, to those that run half the length of the body. Now look for the paired anal fins. These are most essential and in my opinion a fish that has not got these paired anals is not a fantail in the true sense of the term, and should not be shown as such. The show standards allow seven points for the anals and so it is possible that a fish that was almost perfect in other ways could win in a class if it lost all points for anals. If points were allotted for type it would be possible to deduct from these if the anal fins did not comply with the specification. I have dealt with the fins first as I think that they are very important points to be sure of and now I will take the body. This should be ovoid, or egg-shaped. I do not worry about the depth of the body in such young fish as I know that this will develop and deepen considerably as the fish grows. Take the head first as this is included in the marking for the body; it should be wide and short and I like to see a gradual rise in contour from the nose over the top of the head in a convex curve. Many have a tendency to a snout, giving them a perch-like appearance. This is a bad point which they never seem to lose. The body should be short and deep but not almost spherical, as is the case with the veil-tail. To say that it should be egg-shaped is rather misleading as anyone who has had any dealings with birds' eggs will know that they may vary considerably in shape. I think that if you try to pick fish with oval bodies you will not go far wrong. I do not think that you will find that the pectoral and pelvic fins will vary very much. They appear as a rule to match in development those which I have already dealt with.

Unless you have been very lucky I am afraid that you will not find many of your youngsters to come up to this standard. It is very amazing how the fish can vary. You might suppose that if you bred from an almost perfect pair of fish the resultant young would also be almost perfect, but the vastly varied shapes of your young fish will not only surprise you but will make you realise why an almost perfect scaled fantail is worth its weight in gold. No one who has not tried to breed show fish of this standard can ever realise how difficult it is to get a fish that will stand up to all the qualifications necessary. I have had men come to me for fish and for a few shillings they expect the pick of hundreds of fish; they must be absolutely perfect, divided tails, paired anals, oval bodies; in fact the perfect show specimen. I suppose this is natural, but I venture to suggest that if they had a go at breeding such fish they would not then be quite so fussy. Of course you will try to pick out the perfect fish for show but it is not necessary to have the perfect fish with which to breed. You may find that one fish may have an outstanding dorsal fin although the other points are only medium. Well, unless the other points are

(Continued on page 87)

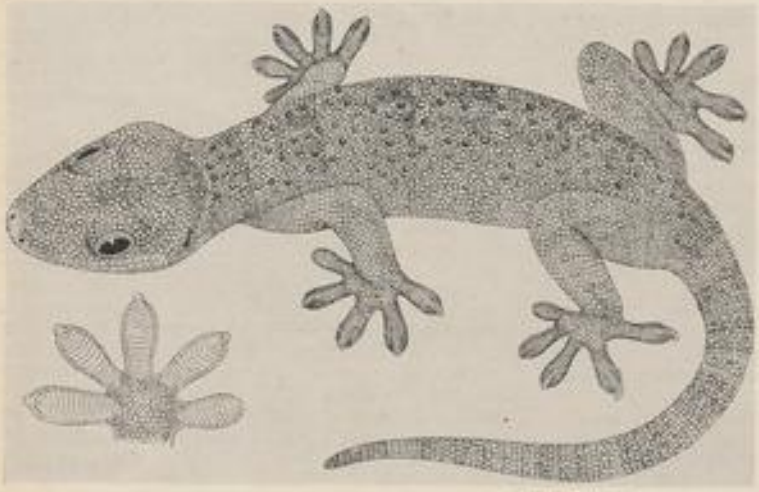
Notes on the GECKOS

by

J. D. ROMER

IN the June, 1947, issue of this journal I contributed some notes on the monitors, an interesting family of lizards containing the largest species in the world. Another family which has always had a great fascination for me, however, is the Gekkonidae (geckos) and I feel that a few brief notes on these may be of interest to those who are attracted to the study of lizards. Although usually attaining a comparatively small size and of rather sombre coloration, the geckos seem to possess a particular charm of their own and a study of their habits and behaviour can be a subject of absorbing interest for those so inclined. If I am not mistaken, in pre-war days these lizards were occasionally imported into the United Kingdom and could be obtained from animal dealers; although this source of supply is not open at present, I sincerely trust that it will soon be possible to obtain specimens for study purposes. In the meantime, there is the slight consolation that it is usually possible to see one or more species on exhibition in the Reptile House at the London Zoo. As far as I am aware, geckos are generally quite easy to keep in vivaria, provided that arrangements can be made to keep them at suitable temperatures throughout the year; my own experience, however, has hitherto been gained by observations of these animals in their natural state.

The many people who have travelled or lived in any of the hotter parts of the world will probably be familiar with the general appearance of a gecko, but a brief description of the more important characteristics may be helpful. They usually differ from the typical lizards (*Lacertidae*) in being softer to the touch and covered above by granules or tubercles in place of scales. The limbs are well developed and there is much variation in the structure of the digits. In some species the latter are not dilated but in the majority the digits are expanded and developed into specialised adhesive appendages by which these lizards are adapted to a scansorial life. On the underside of the digits there are lamellae which, when pressed against the surface upon which the animal is running, cause them to adhere in a similar manner to an ordinary rubber sucker. By this means it is easy for them to run on vertical walls or upside down on a ceiling. As might be expected, the variations in this feature have considerable taxonomic value and are thus made use of in distinguishing one species from another. The tail, in almost all the species, is very fragile, but can be reproduced as it can in the



The Tuck-too
(Gecko gecko)

Below is shown the underside of the fore foot.

(Drawn by Tang Ying-Wei)

majority of lizards. When a tail is broken or damaged it frequently happens that two, or even three, new tails are grown from the point of injury. Coloration varies but the ground-colour is frequently either grey or brown, or a combination of the two, and darker spots or cross-bars may be present.

In the hotter parts of the world where geckos occur, they are found living under many diverse conditions as, for example, in wooded localities, in the desert, in open country, and in gardens, towns and inside houses. There are, in fact, quite a number of species known as "house geckos," and in many cities, towns and villages it is unusual not to see some of these active little creatures on the interior walls and ceilings of the houses and other buildings. They are frequently seen to exhibit the habit whereby individuals, pairs or perhaps groups zealously guard their "territorial rights" in a particular part of the house or room, and any intruders over the bounds of their "reserved territories" are vigorously attacked and driven away. There can be no doubt that these house geckos serve a very useful purpose by reason of the large number of insects they devour. Their food consists of all manner of insects and other small invertebrate life. It is indeed a fascinating, and often amusing sight, to watch these lively little lizards stalking and devouring some of the many insects which have been attracted to an electric light near a wall. Although mostly of nocturnal habits, they by no means shun artificial light and are perfectly at ease within a foot or two of a bright electric light. In the warm weather in tropical and sub-tropical climates there is frequently an endless variety of insect life collected round lights situated near an open window, and I have watched fierce struggles when a small gecko has seized a butterfly or moth, and eventually been unable to cope with the large wings. In such cases the gecko appears to try to grasp the head or body of the insect, but unless the wings are torn off, I am inclined to think that the gecko usually loses its meal. I have watched this and seen the butterfly finally dropped to the ground—dead—and if geckos showed facial expression there would doubtless be one of dire disgust at such an outcome!

Speaking of feeding habits, however, it is not always the gecko that is the predator. Here in Hong Kong, from where I write, there is a regular annual trade, particularly in the winter, when that very large gecko, known as the Tuck-too (*Gecko gecko*) is imported from Southern China to be eaten as food by the Chinese. The accompanying drawing was made from one such specimen which was purchased in Hong Kong. This exceptionally large species has a very loud call sounding something like "tuck-too," hence its popular name. All the geckos are said to possess a voice, but in many it is quite a soft ticking sound such as we can make with the tongue and the roof of the mouth.

In the colder weather geckos either disappear altogether into hibernation or are very much less active. Here in my house there are several specimens of our very common house gecko (*Hemidactylus bowringi*) and since their disappearance into hibernation last year, I noticed two of these for the first time on the 15th February. I did not see either of them again until the 29th February when one of them was seen. They seemed to disappear again until the 7th March and were then seen quite frequently, always in the same part of the house.

Regarding the breeding habits of geckos there is doubtless still a great deal to be learnt, as, for example, the incubation periods of many species. The great majority lay eggs, two being the usual number laid at a time. These are round or slightly oval, with a thin white shell. On being deposited by the female they are covered in a sticky substance which causes them to adhere together and to the surface upon which they are laid. After this the parents take no further interest in them. The courtship of the common house geckos is easily observed, when the male may be seen to chase the female, together with excited vibrations of the tail by both sexes. Before pairing actually takes place, the male may grip various parts of the female's body in his jaws, thus causing the unenlightened observer to think that they are fighting.

BREEDING THE SCALED FANTAIL—(*Continued from page 85*)

very bad this fish may be bred from as you may get this perfect dorsal on to a young fish which is very good otherwise.

You may breed from six fish which do not contain one perfect specimen, but which among them have fish which have at least one very outstanding point. Providing that the fish are bred right, that is, from a good strain, it is possible that from among the youngsters you may find at least one fish that combines the highest number of good points. That is why I do not believe in actually pairing my fish for breeding. I just leave the fish all in the pond together, although naturally I never allow any other fish in the pond than those which I consider good. It is possible to breed from a perfect pair of fish and get nothing but a lot of throw-outs from them. There is something strange about the fantail. These fish do not appear to conform to the usual standards of breeding as expected with other animals. The double tail is something very exceptional which has appeared no doubt in the first by accident, and now it is practically impossible to breed even from a long-standing strain of fantails a batch of fish which are all fantails. It seems impossible that my fish can breed single tailed fish when there has not been one single-tailed fish among my breeders for at least 10 years, but yet I do breed many single-tailed fish among my hatchings.

I hope that I have made it clear then that you must not expect the impossible when buying fish, and you will be surprised what good fish may turn up among your own fry if you breed from fish that, although they may not be perfect in themselves, have come from a good strain. In a later article I hope to be able to deal with the subject of treatment of the breeding fish in preparation for the winter.

NOTES AND NEWS

North Herts. Aquarists' Society

The N.H.A.S. held an exhibition of cold water fish, plants, live food and other water life at the April meeting.

Visitors to the exhibition were welcome and exceeded all expectations. All exhibits were contributed by members and included a section for Coarse Fish (Sun Fish, Dog Fish, etc.), as well as fancy Goldfish.

Two microscopes on the live food section were in constant use and infusoria, hydra and a fine specimen of *Dytiscus marginalis* were the subject of keen interest.

The exhibition was a great success and led to many new members joining the Society; so it was decided to hold a Tropical exhibition at the next meeting, and this proved equally successful.

The first general meeting of **Wembley Aquarist Society** was held at Park Lane school, Wembley, on Tuesday, May 11th, when the rules and constitution were adopted by members. The president, Mr. W. G. Phillips, presided.

Mr. Fraser-Brunner spoke to members about their hobby and its progress. He spoke of its educational value, the need to breed quality fish, and praised the efforts of those who carried on this work during the war so that home-bred fish could now be bought. At the second meeting, held May 18th, a general discussion was the main theme, and several points of future policy were settled. It was decided to hold a table show for Tropicals on Tuesday, July 6th. It was also proposed to hold a lucky number competition at each meeting at question time. The President, Mr. W. G. Phillips, answered members' questions, and all concerned gained some very useful knowledge.

The secretary of the Wembley Aquarist Society is Mr. D Yarsley, 9 Abbots Drive.

The May meeting of the **Halifax and District Aquarists' Society** proved a success and was a double event. A Plant Table Show was arranged, and this was ably judged by Mr. C. Graham, of Leeds Aquarists, who then lectured in his usual fine manner on the Characins. The interest and enthusiasm continues so much that the Society has engaged the room for a further night each month, making two meetings per month. The winners of the above show were: Tropicals—1, H. W. Pollard; 2, J. Ackroyd; 3, R. Grey. Coldwater—1, J. Ackroyd; 2, J. Stott; 3, L. J. Line.

Belle Vue (Manchester) Aquarium Society

An excursion to Dudley Zoo and Aquarium took place on Sunday, the 30th May. Those members who made the trip spent a very happy and profitable day in the congenial company of the Zoo staff and members of the Wolverhampton Aquarists' Society, who kindly gave up their time to act as guides to the Belle Vue members.

Special thanks to Mr. D. Bowles, the General Manager of the Dudley Zoo, for the splendid arrangements he made on behalf of our members.

The June meeting took place at Belle Vue Zoo on Wednesday, the 9th June, and was well attended. The speaker was Mr. G. T. Iles, who gave a talk on his visit to the Denmark Aquarium at Charlottenlund near Copenhagen and to the Malmohus Aquarium at Malmo, Sweden.

The evening concluded with a view of the Belle Vue Aquarium where new arrivals were on exhibition.

New Society at Cleethorpes. With a nucleus of 21 members the Cleethorpes and District Aquarists' Society has been inaugurated. The Secretary is Mr. G. W. Chapman, 28, St. Peter's Avenue, and meetings will be held at 7.30 p.m. on the third Monday in each month at 66, St. Peter's Avenue, Cleethorpes.

Casualty. It is regretfully announced that owing to unfavourable circumstances the Wallasey Aquarium Society has been terminated.

Suffolk Aquarists' and Pond-keepers' Association.

On the 6th June a party of members visited the Aquarium of the London Zoological Society, and a most successful excursion resulted. Through the kindness of the Curator, Mr. H. Vinall, arrangements were made for the party to be conducted behind the scenes and the Head Keeper, Mr. Akhurst, led members through the maze of passages, explaining the devices and methods by which the inhabitants were kept in health and surroundings approximating as nearly as possible to natural conditions.

The breeding tanks proved to be of considerable interest and the outstanding collections of rare characins, and marine specimens were much admired.

The President (Mr. C. T. Nash) expressed the thanks of the party to the Hon. Secretary for adequate arrangements.

The GOLDFISH SOCIETY OF GREAT BRITAIN

In our notes in the last issue we inadvertently omitted the name of one of the Vice-Presidents—Mr. Strachan Kerr, the distinguished Scots aquarist. Mr. Kerr, incidentally, has presented a challenge cup for the best Veiltail.

This Society is a very new one, founded by enthusiasts who are no longer content to carry on keeping and breeding the various kinds of goldfishes in the same haphazard way as in the past.

The Society is prepared to enrol any genuinely interested person within its ranks. If, besides being interested that person is capable of helping the Society in the smallest degree, he or she will be doubly welcome.

The Society has one main object, the study of the varieties of Goldfishes, the very intense study, in the hope of discovering much that is at present unknown about these extremely interesting fishes.

A programme of research has been formulated which if properly carried out should do much to elucidate what are at present complete mysteries. How, for example, is it possible to breed a consistently high standard of fishes? How are the colours so much admired in specimen fish inherited? What causes certain fishes to die, while others in exactly the same environment live and flourish exceedingly?

All the work of the Society can be done in the homes or fish houses of its members and this fact dispenses with the possible objection to giving up a particular evening for another "fish club meeting."

A bulletin, the first number of which is now in the course of preparation, will keep all members fully informed of happenings in the goldfish world, and through this same bulletin the business of the Society will be conducted, thus giving every member, no matter how far away he lives, an equal chance of voicing his opinion or recording his vote.

All members will be expected to offer the best of his surplus fishes to other members before disposing of them outside the Society.

Full membership is obtained for an annual subscription of 10 -.

Associate membership costs 5/- per annum, but does not entitle the associate to vote.

Applications to join the Society should be made to the Secretary, C. E. C. Cole, 46, Vine Gardens, Ilford, Essex

East London Aquarists' and Pond-keepers' Association

At the last meeting held at St. Margaret's Hall, Barking, the major part of the evening was devoted to a discussion of the recent Barking Fish Exhibition. It was resolved that the future exhibitions be held the first week-end after Whitsun.

The Show Secretary, Mr. J. Myers, and Show Organiser, Councillor B. Howe, and officers, were thanked for their work in connection with the show. Members were made aware that over 1,300 visited the exhibition.

Arrangements were made for members to visit the Zoo in the near future, and for a club trip to Margate.

It was announced that at the next meeting members will have an opportunity to dispose of their surplus fishes and plants by auction.

Owing to the large number of entries for the Table Show the classes were sub-divided.

Results

Breeders: 1st, Mr. Campkin, Mollie; 2nd, Mr. Cole, Mollie; 1st, Mr. Campkin, Platy; 2nd, Mr. Cole, Platy; 1st, Mr. Johnson, Mollie.

Table Show: 1st, Mr. Campkin, Mollie; 2nd, Mr. Campkin, Platy; 3rd, Mr. Johnson, Platy; 1st, Mr. Johnson, Mollies.

Ilford and District Aquarists' Society

The Annual General Meeting of the Society took place on Wednesday, 2nd June.

Apart from the renewed difficulties of finding a suitable meeting place, the year has been most successful. The membership is steadily increasing.

Talks have been given on many occasions, the subjects being Livebearers, Breeding Dwarf Gouramies, Sexing Gouramies, Tropical Aquariums, Goldfish, Aquatic Plants, Micro Worms, Water, Aquatic Insects and Reptiles.

Study groups inaugurated in April have met with great success at the houses of Mr. Robins, Mr. Mullings and the Secretary, Mr. Carter. These will be continued at the request of the members, Mr. Salter and Mr. Hayward acting as hosts.

Raffles of produce and fish presented by members, first introduced in November last, have been popular and of considerable help to the funds. Their proceeds have enabled the Club to buy two Innes books for the library.

With permanent quarters for meetings this coming year should prove far more successful than that which has just ended.

The Wolverhampton Aquarists' Society photographed during a recent visit to the Aquarium at the Dudley Zoo

(Photo: J. T. Jackson)

A LETTER ABOUT FAIRY SHRIMPS

(Chirocephalus diaphanus)

With reference to the article on "Phyllopods" in the April issue, members of the Bournemouth Aquarists' Club found specimens of the Fairy Shrimp in a pond at Brockenhurst, Hants in January last, as reported by me in the January issue.

By the end of March they had quite disappeared and owing to the dry spring the pond subsequently dried up, but the recent rains have filled it again and the same members brought along to our June meeting a number of young shrimps found in the same pond. It would appear that eggs from the earlier occupants had, after being desiccated, recently hatched, as all the present brood are quite young and no fully grown specimens were found.

I succeeded in keeping some of the shrimps found in January for about three months in an indoor aquarium (the last died early in April) and although the females must have dropped a number of eggs in the aquarium no sign of any young ones has yet been seen.

VERNON E. POULTON,
Hon. Secretary,
Bournemouth Aquarists' Club.

Cardiff and District Aquarists' Society

At the invitation of the Bath and West and Southern Counties Society the Cardiff and District Aquarists' Society staged an exhibition of tropical and cold water fish, at the Bath and West show in Cardiff, from the 26th to 30th May.

As the show was non-competitive a number of community tanks were among the exhibits. It is estimated that close on 25,000 people visited this stand and there were comments from the visitors that the exhibition rated second to none in Cardiff.

The heating arrangements were undertaken by Mr. Chapman, 15, Maelog Place, Mynachdy, Cardiff, who supplied "Little Wizard" thermostats and heaters by courtesy of the manufacturers, British Aquarium Products.

It will be agreed that this venture was rather ambitious for a Society formed only in November last. It must be admitted that some of the members had misgivings but the success of the show exceeded expectations and they were delighted with the opportunity of putting the hobby on the map in this area.

Mr. G. E. Davies, 138, Cyncoed Road, Cardiff, has been appointed Secretary of the Society.

Cambridge and District Aquarists' Society

The fifth meeting of the Society was held in the St. Andrew's Parish Room on May 4th, when 22 members attended. An intensely diverting lecture, illustrated by lantern slides, was given by Dr. Lissman of the University Zoological laboratory, on "Betta Splendens"—the fighting fish of Siam. Not only are the breeding habits of this highly-coloured two-inch fish very fascinating, but its fighting tactics, when encountering another male are amazing to a degree, even embracing a kind of Queensberry rule by which two fighters will break off a fight to the death in order to take a breather at the surface, during which neither will molest the other. The fight is then resumed in all its intensity, usually finishing with the utter defeat and death of one of the fish.

Thrifty Siamese governments have turned the national habit of gambling with these fighting fish into a source of revenue. Licenses have to be obtained for public fights, entertainment tax is charged to the spectators and a limit is imposed on wagers made. At private fights, however, supporters of a fish have been known to stake their whole fortune, their entire property, their wives, and even their personal liberty.

At the meeting on June 1st a record attendance of members listened for two hours to Mr. Fraser-Brunner, who touched on every aspect of the keeping of cold water fish, both in aquaria and in garden ponds. There was a tendency, he said, for collectors to go all out for the highly coloured exotic varieties of fish and entirely to ignore our own indigenous species, which, if not perhaps so showy, were, when kept under the right conditions, both beautiful and interesting.

He instanced, among others, the carp, rudd, tench and minnow, whilst it had been left to the Americans, he said, fully to appreciate the beauties and possibilities of our common three-spined stickleback. The breeding habits of this little fish, when kept in the right environment, were comparable to those of any tropical cichlid, and would amply repay the aquarist in pleasure and interest.

A vote of thanks to the speaker, who had travelled from London specially to address the meeting, was carried with acclamation on the proposal of the President of the Society (Mr. Vincent Butler, F.Z.S.).

The next meeting will be at the same place at 7.30 p.m. on Tuesday, July 6th, when any person interested is invited to attend.

PUBLIC AQUARIUM FOR CAMBRIDGE

Under the direction of Dr. Lissman, two large rooms in the Department of Zoology in Downing Street, Cambridge, are being fitted with well-equipped aquaria for the maintenance of temperate and tropical freshwater fishes and marine fauna. Some reptiles will be housed at one end. The work has only just begun, but already a number of native species such as gudgeon, loaches, minnows, sticklebacks, and some amphibians are installed in small tanks at an upper level, while much bigger aquaria are being constructed below. Members of the public will be admitted when the work is completed.

An advertisement appeared in *Exchange and Mart* on April 29th, offering *The Aquarist* of 1934-39, with six numbers missing, for 35/-. One of our readers says he wrote for them at 9 a.m. on the day of publication, and received a reply that they were sold to a local aquarist about an hour before our correspondent read the "ad."! Someone saw a golden chance and seized it.

Watford Aquarists' Society

Mr. F. Guy, who designs some of the sets at the Ealing Studios, judged a competition for miniature water-gardens on April 23rd. On May 7th, Mr. W. G. Phillips gave a talk on the Guppy which was greatly appreciated by the members. Similarly helpful were the lectures by Mr. Holland Russell on Labyrinths (June 4th) and by Mr. A. Boarder on Fancy Goldfish (June 18th).

The second Annual Show is being held on August 28th, 1948, at Victoria Schools, Addiscombe Road, Watford. The classes will differ slightly from the last occasion, whilst cash and special prizes will be awarded as before. The Show Secretary is Mr. H. E. Morris, "Craig-y-don," Little Bushey Lane, Bushey Heath, Herts.

British Herpetological Society. This Society now has a large membership, with numerous contacts abroad. The latter will assist, by a system of exchange, and in other ways that may arise, to increase the number of species available for study by members. Numerous outstanding problems concerning British reptiles are being tackled and new methods being devised. A means of marking frogs and toads by means of special rings is now being tried, and it is hoped to find a simple way of marking lizards later. A quarterly "Notice," giving news of the latest developments, is circulated, and a journal containing the results of original research will be published annually.

Meetings are interesting, and include expeditions for field-study, such as the one on May 22nd for the purpose of studying the Edible Frogs at the Ham sand-pits. The latest development is the decision to form a branch of the Society at Bolton to provide for the needs of northern enthusiasts.

All interested in reptiles should belong to this Society. The Secretary is Mr. Alfred Leutscher, British Museum (Nat. Hist.), Cromwell Road, London, S.W.7.

The **Balham and District Aquarist Club** has recently been formed. The Secretary is Mr. A. F. Price, 19, Boundaries Mansions, Boundaries Road, Balham, S.W.12. Meetings—Every Monday, 8 p.m., at Balham and Tooting Labour Rooms, Balham Park Road, S.W.12.

Owing to the resignation of Mr. S. H. Scott, the **Nottingham Aquarists' Society** has appointed a new Secretary—Mr. A. D. Spowage, 6, Third Avenue, Sherwood Rise, Nottingham. (Phone: 65465).

Preston and District Aquarists' Society now hold their meetings on the second Wednesday of each month, 7.30 p.m., at Fox Street Methodist Schoolrooms.

Mr. J. H. Anderton, 54, Crofton Road, Highgate Road, N.W.5., has been appointed Secretary of **North London Aquarists' Society**, following the resignation of Mr. J. Gregg.

The **Harrow Aquarists' Club** has changed its headquarters to 1, Cecil Park, (Y.M.C.A. building) Pinner, and the Secretary, Mr. Sanders, has a new telephone number (Field End 9210).

The Directory of Aquarium Societies has been omitted this this month, but will appear in July.—Ed.

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Green Tench ..	—		**7/-**	**10/-** **15/-**
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