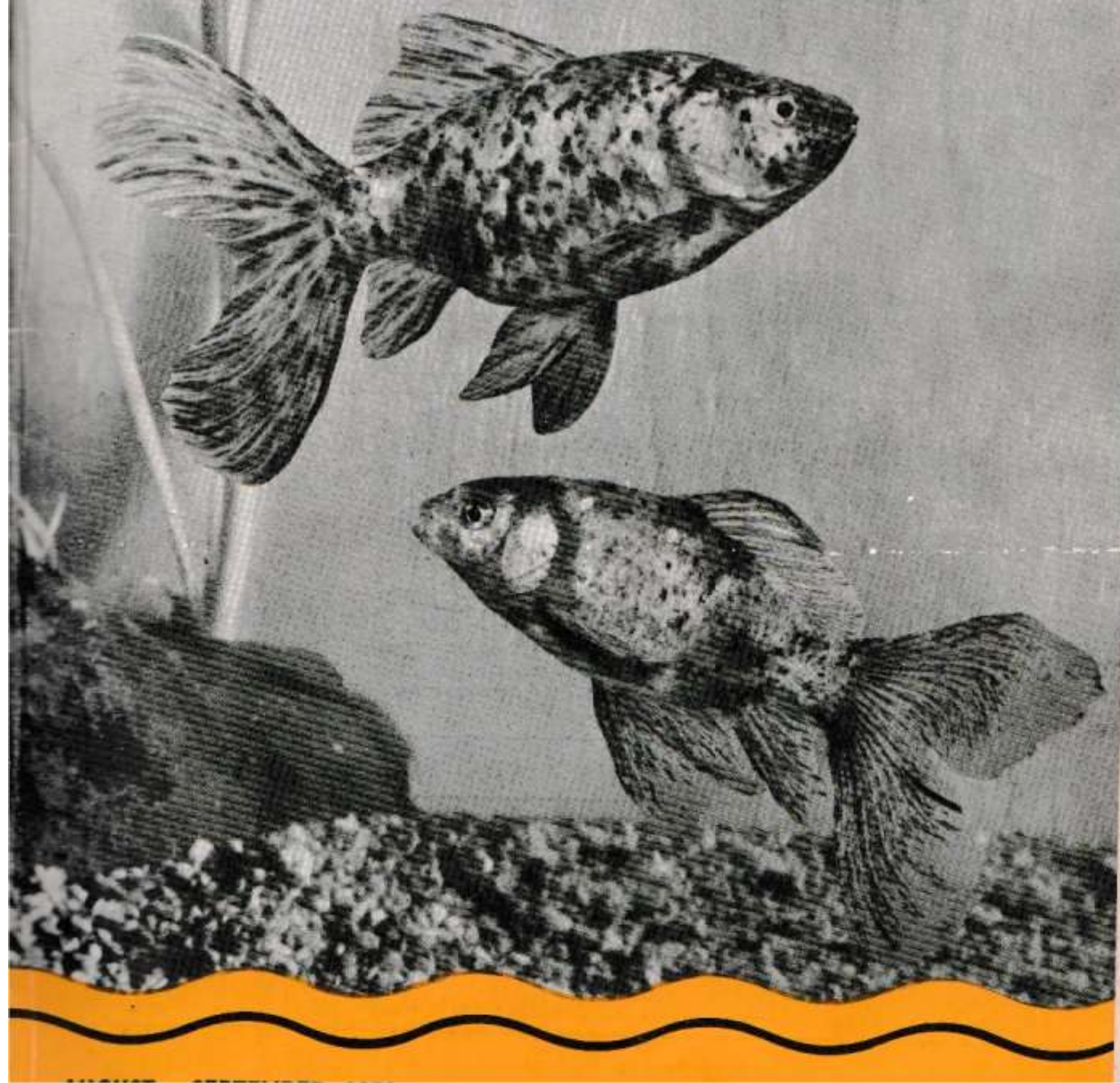


Royce

# Water Life

AND AQUARIA WORLD



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AND AQUARIA WORLD

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**FRONT COVER: PROUD BEARING.**  
Two shapely Shubunkins, a hardy Goldfish variety equally at home in aquariums or ponds. Those photographed have fully grown caudal and dorsal fins and are representative of the Bristol Shubunkin type, distinct from the London Shubunkin in which the body and finnage are similar in shape to those of the Common Goldfish.

Photograph]

[L. E. Perkins

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## EDITORIAL

### Forcing the Pace

**M**ANY of us go to great lengths to keep our tropical fishes under conditions like those which they would experience in their natural habitat. We choose appropriate underwater plants, select suitable gravel and rockwork, control the light, pick on an acceptable diet, ensure that the water conditions are seemingly correct, and finally determine a heat range.

Following advice given by others who have succeeded in breeding the species we decide to pair up and get apparently good spawnings. The resulting satisfaction is great and our prestige goes up. That being so, it is hard to believe we may not be doing the best for our stock or for our fellow aquarists to whom we pass on any surplus youngsters.

With all the precautions taken, we may overlook that in tropical climes there are considerable variations in temperature occurring between midday and midnight and between the seasons; changes that reflect themselves in the warmth of the water in the sluggish shallow streams where so many of the fishes known to us rear their families.

If we become slaves to an inflexible standard measure of warmth all the year round, with no more variation than one or two degrees on either side of a given thermometer reading, we may get results that at first are pleasing but which can give rise to trouble. Fishes kept in this way are often fed to excess and forced into premature maturity. How many fish, bred like hothouse plants, are lost when sold or given to another aquarist? They fail to stand up to the more spartan conditions provided.

#### Resting Periods Essential

Our aim should be to create stock which will give us healthy young from which, in turn, vigorous strains will continue to be produced in succeeding generations. To get such virility, the parents should not be forced all the time but allowed quiet resting periods at comparatively low temperatures, the heat only being raised when the time is considered ripe to bring them into breeding condition. In that way we may get fewer but better spawnings presenting us with robust fry.

Visits to fishhouses of different designs have shown that there are many shades of opinion as to the most efficient method of getting the warmth needed for our tropicals. Perhaps the best system is a combination of a modest degree of space heating, to prevent the temperature dropping below danger level, with a thermostatically-controlled auxiliary system that comes into play when the desired temperature in our tanks is not being maintained. Even so, the setting of the thermostat should not go unchanged all the year round. When breeding is being encouraged the reading will be higher and will remain so until the spawning is over.

With a constant high temperature some make their fishes undergo a short life and a merry one. Other aquarists remember that some temperature change daily and seasonably is natural. By letting such changes occur they are rewarded with better quality stock which live longer.

## Current Research

# Breeding Behaviour of Male Sticklebacks (2)

By Alastair N. Worden, M.A., B.Sc., F.R.I.C., M.R.C.V.S.

**I**N the last issue we noted certain details of the important work on the breeding habits of the male Three-spined Stickleback that has been carried out since 1934 at Leiden University. We concluded at the end of nestbuilding.

During the nest-building phase the male reacts aggressively towards a female, even one that is "strongly courting". Readiness to accept a ripe female indicates the commencement of the courtship phase (which will form the subject of a later publication by the Leiden workers) but, so far as the present study is concerned, it appears that the number and intensity of the "zig-zag dances" or charges of the male when the female enters his territory may be employed as a measure of his sex-drive at the time. When a female enters his territory, the back of the male at once becomes light on account of contraction of the melanophores or pigment-bearing cells.

Courtship ends with deposition of the eggs by the female in the tunnel of the nest, a clutch consisting of approximately 60-100 eggs. One male can take care of at least seven clutches, and as a rule fertilises the clutch as soon as the female leaves the nest. After each fertilisation, or even shortly before it, the back darkens again. The light back is held to act as a "social releaser" and to stimulate the female. It may also have some survival value in rendering the conspicuousness of the male from above less evident.

Immediately after fertilisation the male attacks the female. This may be due to the fact that the thin female, after spawning, no longer provides the necessary stimulus and may be due also to a lowered sex-drive on the part of the male, which for a varying time after fertilisation does not show even a stray tendency to court a second ripe female.

Several minutes after fertilisation the aggressiveness towards the female decreases and the male shows interest in the eggs, which he violently pushes into the nest and presses to the bottom, adopting a vertical position for the latter process. When the eggs have been dealt with, a second female may enter the nest easily. Subsequent clutches are not laid directly on top of one another, but rather in the manner of roof tiles, and to accommodate

them the male lengthens the nest during short but intensive periods of building activity.

After the fertilisation of one to several clutches, the next and last phase of the cycle begins, i.e., the caring for the eggs and young. The transition occurs gradually, for the male remains sexually active for several days after the first fertilisation. During this last or parental phase the colour of the male again changes and, at the peak of parental activity, he again possesses the protective coloration seen at the time of the nest-building phase.

During the parental phase the most striking activity is the fanning movement referred to in the previous article, which serves to ventilate the eggs. Other activities at this time include cleaning the eggs (mouldy ones being picked out carefully), retrieving eggs that lie outside the nest, and pushing holes into the nest in order, presumably, to facilitate entry of a stream of water. About the middle of the parental phase the male commences "nestpulling activity", persistently snatching at pieces of nest material and carrying them away when they have been torn loose. The eventual result is complete deformation of the nest, leaving a heap of material with a large hollow in the middle, an arrangement which again facilitates the passage of the ventilating stream.

### Care of the Young Fish

After some time the first young try to swim out of the nest. The male continually tries to catch them, chases them and, after sucking them in, spits them back into the nest pit. These attempts persist after the young are schooling above the nest and are able to avert capture.

At the end of the parental phase there is a sudden change in the behaviour of the male, which now treats its young as any other small moving object, i.e., as food. For a couple of days or so the male does not appear to exhibit any behaviour specifically connected with reproduction, but then a second cycle begins. From observations made in tanks at Leiden it has been calculated that the average Spring temperature must enable a male Stickleback to complete about five cycles in one season.



### WATER GARDENS AT THE CHELSEA SHOW



Photographs (WATER LIFE)  
Exhibits in the water-garden section at this year's Show. Above: George G. Whitelegg's informal garden. Right: a view of Ian G. Walker's entry.

# Arrival of Pompadour Fish

by Alwyne C. Wheeler

(*Symphysodon discus*)

RECENTLY a considerable stir was made by the daily newspapers when six Pompadour Fish (*Symphysodon discus*) arrived at London Airport. They were appropriately described by the press as "flying-saucer fish". Pompadour Fish are old friends but, unfortunately, are too rarely seen these days and this was only the second or third batch to arrive since 1940, few from the earlier shipments came on to the market. It is just twenty years ago that this species became known to aquarists, first appearing in America and later in Europe. On account of this, and because very little has appeared in British magazines, a brief report on this species is now given. It must be stressed, however, that very little is known on this species, save that it is difficult to obtain and even more difficult to rear successfully.

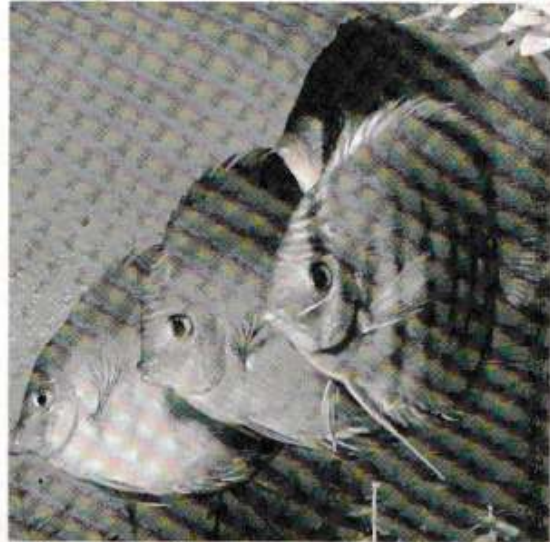
*Symphysodon discus* means approximately "disc-shaped with teeth in the centre of the lower jaw". It was the name bestowed by Johann Jakob Heckel, an Austrian zoologist, in 1840. These specimens were collected by Johann Natterer, while exploring Brazil in 1817-1835. Natterer was probably the first white man to see the Pompadour in all its splendour. He caught them at Morere on the Rio Negro, one of the northern tributaries of the Amazon.

## Found in Small Numbers

From that time onwards *P. discus* were taken by many expeditions, but always a few at a time—never more than a dozen together. Indeed, it seems that this species is thinly spread over all its range; having been taken at Tefé far up the Amazon and at Porto do Moz at the mouth of the river, over one thousand miles away (see diagram on this page).

Very little is known of the conditions it favours in the wild. Innes (1933) says, "*Symphysodon discus* is found in the Amazon in the same range as *Pterophyllum scalare*, but instead of being found among reeds, is located in stony situations." It seems likely, however, that finding this fish in stony situations is the exception rather than the rule, and probably it occurs only while spawning. Generally *P. discus* spends its time in sheltered situations under the floating islands of vegetation, and drifting tree-trunks festooned with algae and aquatic plants, which are typical of the smaller tributaries and backwaters of the Amazon.

As already mentioned, aquarists first noticed this fish in 1933, when a small consignment reached New York. Reaction was immediate and very favourable, but more specimens were slow in becoming available. A year later the first report of breeding was published, although the eggs proved to be infertile. This was to be repeated only too often in later years. The first successful spawning was reported by Dwight Winter of Philadelphia, in "The Aquarium" of August, 1934. He said that his pair had produced three infertile batches of eggs, a fourth brood hatched but died, while of the fifth he reared a few successfully. The greatest difficulty in breeding this species is in finding food that the fry will take. By comparison with other



[Photograph]

[Daily Sketch]

Four fish from the recent consignment of adult Pompadours, pictured soon after their arrival in this country.

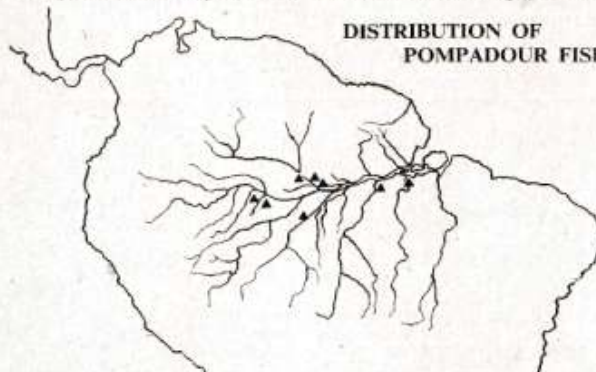
Cichlids the newly-hatched *P. discus* are very small, and presumably this is the reason for the feeding problem. However, once the fry have started feeding growth is rapid and the difficulty becomes much less. In general, breeding can be successful by remembering the following points: (1) Temperature 85-90 deg. F.; (2) Removal of both parents after spawning; (3) Constant aeration of the water near the eggs; (4) Slightly acid water may be an advantage.

Courtship in this species is very complex and any opportunity to watch it should be taken. It includes much "kissing" and display on the part of the male, who also makes apparently aggressive charges, which are evaded by the female side-slipping at the last moment.

*Symphysodon* belongs to the Cichlidae, the Family which also includes such aquarium favourites as the genera *Tilapia*,

*Cichlasoma* and *Pterophyllum*. Undoubtedly it is related very closely to the latter, but it differs from it in more ways than in the lack of teeth in the sides of the jaw, as is stated by some authors. There is only one *Symphysodon* species, although a variety has been described in which the vertical bars are all equally distinct and which lacks the longitudinal stripes. There are eight or nine spines in the dorsal fin and twenty-eight to thirty-one rays, although there is little need to verify its identity by this character.

## DISTRIBUTION OF POMPADOUR FISH



Map of the Amazon Basin, showing the areas where the elusive Pompadours (*Symphysodon discus*) have been caught.

# Aquarists of the World

David G. Dixon, U.S.A., Steps  
in and Discusses *Fishkeepers*

**B**ECAUSE fishkeeping has so much to offer in pleasure and fascination, interest in the hobby has grown to such an extent that now the English-speaking nations are beginning to make comparisons of their respective advances in the hobby. At times the rivalry becomes a little more than healthy, and remarks begin to fly which border on bickering. If a tumult does arise, the thoughtful reader may wonder what the fuss is all about.

Without attempting to show any differences between the British and the American aspects of the hobby (frankly, the writer doubts if there are any *real* ones), perhaps it would be best to pause for a moment and point out that all people interested in fishkeeping, regardless of nationality, can be divided arbitrarily into three main groups. Some folks will qualify for more than one category, and some might possibly fit into all three, but let us set up the groups as follows:—

**COLLECTOR—SOCIAL TYPE:—**This man is mainly interested in having colourful fish in his garden-pool, or he keeps some vivid little denizens in his study aquarium. He likes them all because they are easy to keep, are interesting, inexpensive, and a source of pleasure and relaxation. If he is a member of a club, he goes for social contacts and not for any technical information, unless he is bothered with minor difficulties in maintenance.

**TECHNICIAN—SHOWMAN TYPE:—**This man has discovered that the life histories of his fish are not only studies of boundless fascination, but also that Nature has set a challenge for him to breed and improve various strains of tropical types. Plenty of technical knowledge is needed to compete and achieve success in this field, and much of the information at his disposal is highly controversial. This type of enthusiast has a great deal to say.

**SCIENTIST—DIRECT OBSERVATION TYPE:—**This man is interested in fish because they are vertebrates, just as men are vertebrates. Structures and diseases of one vertebrate (the fish) can be related to those of another vertebrate (man), so the scientist is interested in experimenting with fish because they are cheap, clean, easily observed, and—distantly—related to man. The scientist is most interested in adding to our knowledge of the pure science of life by means of his direct observations. This is the source of much of the material about which the technician (mentioned above) argues.

The writer has lived in East Africa, and on both the Atlantic and Pacific seaboard of the United States. He has travelled in England, Canada, Mexico, on the Continent and through the Near East. It is his opinion that the vast

majority of aquarists are in the first category. Most of the aquarium organisations are social groups which like to exchange fish and information on a friendly "how to do it" basis.

The second group is growing by leaps and bounds. The thirst for knowledge is not passing the aquarist by; fish are a fascinating and challenging subject involving not only chemistry, gardening and genetics, all in one vast field of experimentation, but also a natural-history type of fascination which can be adapted (even in a crowded city) to an indoor pursuit without distressing either the neighbours or the landlord. There are ribbons, cards and cups to be won at the competitive shows, and always there is personal satisfaction which only the individual himself can evaluate.

The third group seems a bit remote to most of us. His academic degrees, his polished use of polysyllabic words, and even his white lab. coat, are things which set him apart and keep us from arguing with him.

Now let us survey these groups as a whole. Since most persons fit into the first group, they are quiet, unassuming and seldom heard. They are the backbone of the hobby as far as the retail trade is concerned but, since they seldom get into arguments, we forget all too easily that these people exist. The third group wastes little time in argument, it is the scientist's job to make deductions from direct observations. Argument for its own sake is not conclusive enough for him.

## Second Group Responsible ?

Then . . . it must be the second group from which we hear all the controversial sounds ! So, the next time you hear it said that such folk think that they have discovered or developed or decided that this is so, remember that the remark is from a small section of experimentalists found in every country who are bound to be highly opinionated and argumentative to begin with, but who seem doubly provocative because the field they are talking about is a controversial one from the very beginning. If these people get excited, one with another, it is not because they are British or Americans wrangling over spilt tea, but because they are both involved in discussing a fascinating subject which has become dear to their hearts. If they can get so vitally interested in Nature's fantastic processes, we should cheer them on as being workers towards the same goal rather than political opponents.

Ah, you say, he's going to back down and say that there is no comparing the hobby from one country to another. Actually there is no true basis for a comparison, but Swedish or Japanese, Danish or German, British or American, it's all one hobby; our advances are yours, your advances are ours.

Most fishkeepers have not organised their little societies into larger ones, let alone organised their fish tanks for maximum benefit; so there are no statistics to go by, only opinions to formulate. The writer's opinion is that it is all one hobby, the world around and it is as fascinating a hobby as you will find, the world around, at that !



## TEXAS SOCIETY'S OFFICERS

*Live-wire Alamo Aquarium Society, San Antonio, Texas has S/Sgt. Charles F. Beard as its President. He is pictured, left, looking at a Black Sailfin Mollie in an aquarium. Right is Mrs. Joe B. Davis, treasurer, beside one of her aquariums. Alamo A.S. produces a comprehensive bulletin entitled "Angel Notes".*



# Variation in Goldfish

## 4. Protruding and Bubble Eyes — Fin Structure — A Policy for the Future

By R. J. Affleck, M.Sc., M.R.S.T.

**R.** HANCE, in an article on "Heredity in Goldfish", published in 1924, illustrates six different types of eyes found in Goldfish. Sketches based on those by Hance are seen in Figs. 33-38. His "flat eye" is that seen in the Common Goldfish whilst the others are variations of the protruding-eye ending with the Celestial eye in which the pupil is directed upwards, although not vertically so.

A simplified diagram of a section through a "flat eye" is shown in Fig. 40. It will be noted that the eye of a fish is very similar, although not identical, to that of a human-being. Vision under water is, as might be expected, restricted to comparatively short distances and the eye of a fish is adapted for short sight when compared with our own. When the water is muddy the vision of a fish is restricted considerably, but in spite of all the difficulties a Common Goldfish is able to see fairly well.

Fig. 41 is a section through a protruding eye and shows that it is modifications to the whole eye ball which give the characteristic appearance. In these eyes the lens remains approximately the normal size but the retina etc., become stretched over a much greater area and are, in consequence, much thinner. As the distance from the lens to the retina has been increased without any compensatory alterations in the shape of the lens, it follows that fish with these eyes must be short-sighted although they can differentiate between light and dark.

In spite of their lack of clear vision, Globe-eyes and Celestials can hold their own in a tank of mixed varieties and, judged merely on their general behaviour, it is difficult to believe they are so handicapped. Fish, however, rely

### SEVEN TYPES OF EYES SEEN IN VARIETIES OF GOLDFISH

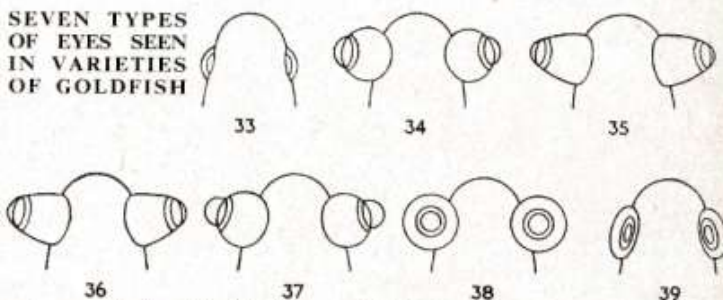


Fig. 33, flat eye. Fig. 34, protruding spheres. Fig. 35, protruding ovoids. Fig. 36, protruding truncated cones. Fig. 37, protruding segmented spheres. Fig. 38, protruding spheres with pupils directed upwards. Fig. 39, the recently-seen bubble eyes. (Figs. 33-38 after Hance and Fig. 39 after Chen)

superficially, they appear to be Celestials with eyes which have not moved completely round to their proper position but, in true Celestials, the bulge appears to be a solid structure and, in fact, contains eye muscles, etc. In the Celestial the pupils are directed upwards and forwards and, as the fish swims slightly head down, the eyes resemble car headlamps when the animal is viewed from the front.

In contrast to those of Celestials, the eyes of a Bubble-eye are directed sideways and it is only the fluid-filled bubble which gives the eye a somewhat turned-up appearance. The shapes of the eyes may be seen in Figs. 42-44 and should be compared with those of the Celestial in Fig. 45.

These new Bubble-eyes appear to be extremely good specimens as may be seen from the photographs.

They are also hardy fish and extremely active. As all are still alive (and show no signs of dying!) there has been no opportunity to make studies of the bubble. However, Mr. Horeman very kindly allowed me to spawn his specimens and I am hoping to be able to make detailed studies in the near future. So far as I know Bubble-eyes have not previously been seen in this country, but it would be interesting to hear from some of the "old hands" who have long memories.

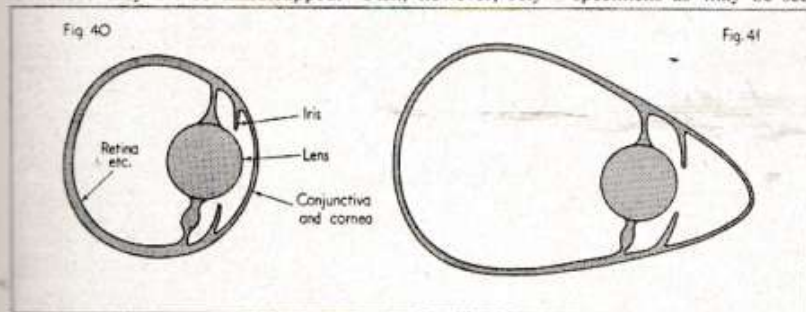


Fig. 40, section through a flat (normal) eye. Fig. 41, section through a protruding eye.

on their sense of smell and particularly on their ability to feel vibrations in the water.

S. Chen, a Chinese scientist, illustrated four different types of eyes that he found in Chinese Goldfish—the one of special interest being the bubble eye (Fig. 39). The general structure of this eye appears normal but around it, particularly on the under-side, there is a fluid-filled, bag-like structure. In Chen's illustration the bubble is not large.

In a consignment of Goldfish from China, Mr. T. Horeman found five specimens which lacked dorsal fins but which had extremely large bubbles under their eyes. Four of them were exhibited at this year's N.A.S. Exhibition. Very

The fins of a fish are remarkable structures as they are very strong in action yet delicate in construction. Each ray of the dorsal, caudal and anal fins is composed of two sets of bones lying side by side, but when the ray is viewed from the side (Fig. 46) only one set may be seen. As the extremity of the fin is approached the rays become divided, as shown in the diagram, and the number of units supporting the edge of the fin is increased although their size is decreased—the longer the fin, the more each ray is divided and the more delicate the bones are.

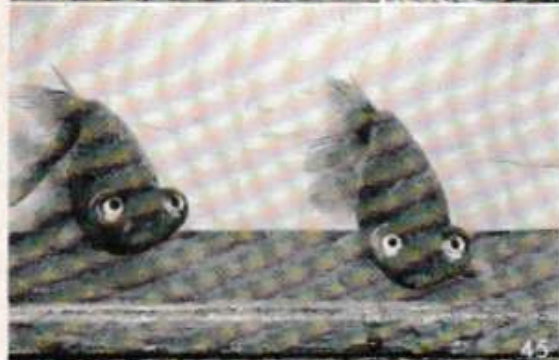
It follows, therefore, that one of the fundamental differences between the caudal fin of a Common Goldfish and a



Photographs

L. E. Perkins

Fig. 42, Bubble-eye Goldfish. Note size and shape of the bubble; the actual eye appears normal. Fig. 43, top view of a Bubble-eye. Fig. 44, side view of a Bubble-eye—the bubble is mainly beneath the eye. Fig. 45, Celestials with pupils directed upwards and forwards, surrounding tissues appear solid.



Twintail is that in the former each ray has only become divided three or four times, whilst in the latter each has become divided many times. Each ray is comparatively straight, although it will tend to droop if the fin is long. In the case of a Twintail the rays are not capable of supporting the fin in its normal position and so it droops. It is noticeable, however, that bacterial infections in the fins of a young fish usually lead to deformed rays in the adult.

#### Tail Fin of Shubunkins

In some Goldfish standards the caudal fin of Shubunkins has been drawn as if it were constructed of very curved rays. If you look at a fish (e.g., WATER LIFE, February-March, p. 14, Fig. 10) you will notice that the upper margin of the fin is comparatively straight and that it is only in specimens where the fin is large that the upper rays become bent under the weight of the fin.

As might be expected, the rays of a young fish are simple.

#### Readers' Hints and Tips

##### Wood Wool as a Spawning Medium

I FOUND some difficulty in obtaining large quantities of floating plants for spawning surface egg-layers such as Panchax species. Finally, after trying several materials, I used wood wool intended for packing purposes. The wool was first of all boiled to ensure it was clean. Then, to make it look a little more natural, I stained it brown by placing it in a strong potassium permanganate solution for 10 minutes.

The resulting mass of wood wool does not float but it may be supported at the surface by wedging a suitable length of wooden dowel across the tank or, in the case of egg-droppers such as Zebra Fish, the wool can be allowed to drop to the bottom. The wood wool is readily obtainable as it is used for all forms of packing but, in any case, it can be utilised again if boiled before use.—(S. T. Dean, Wythall, Warwickshire).

(10s. 6d. is paid for all published hints and tips.)

When the fin becomes larger new segments are added to the end of each ray and occasionally the new segment becomes divided—the larger the fin the more times each ray becomes divided.

Fig. 47 is a diagram of a section showing the paired rays in a normal anal fin as seen in a Singletail. Some varieties (e.g., Twintail) appear to have two anal fins (or caudal fins) side by side. Fig. 48 shows that there are not really two complete fins, but that the original structure has been divided and it is obviously correct to refer to such fins as "divided anal", or "divided caudal," fins.

#### The Future ?

In this series we have discussed the variations found in Goldfish. It is difficult to believe that Twintails, Bramble-heads, Bubble-eyes, etc., have all originated from the wild-type fish and it may be said that there is a greater variation amongst the varieties of Goldfish than there is amongst the varieties of any other animal. What should we Goldfish lovers do to preserve and perpetuate these variations? My rules are as follows. What are yours?

1. Keep the number of recognised varieties small so that we concentrate on quality not quantity.
2. Discourage any variety which can be produced as a throwout from any other.
3. Recognise the three interbreeding groups.
4. Pay particular attention to the body, the special

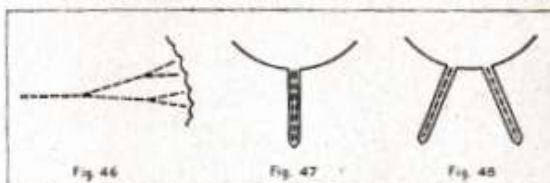


Fig. 46, fin ray. Fig. 47, normal anal fin. Fig. 48, divided anal fin.

5. characteristics, and the condition of exhibition fish.
6. Base standard drawings on real fish.
6. Recognise that the proportions of fish vary with age and, in shows, discourage the exhibiting of small fish.
7. State in precise terms what characters a particular variety should possess and disqualify those that do not pass the type test.

The Goldfish Society has been tightening up on standards during the last four years and evidently this policy has produced results. When I visited the last meeting I was surprised to find that instead of the half-dozen fish of real merit, which we usually see at most large shows, there were between twenty and thirty Singletails and Twintails which would have been considered as outstanding five years ago and, what was more remarkable, there were no poor specimens.

# Indoor Tropical Pool

Gas Heating Used in Novel Arrangement for Accommodating Large Numbers of Young Fish

By Dr. F. N. Ghadially

THE provision of adequate space is a prime factor in the rearing of fish fry. No amount of feeding can make fish grow if they are crowded. Aeration helps up to a point but it is by no means a complete substitute for a large volume of water. Keeping such a quantity of water at 78 deg. F. can be a very costly business if the apparatus has not been chosen with care. The main problem is to find a convenient and economical means of maintaining a considerable amount of water at a relatively high temperature.

The gas-heated pool described in this article was built in the basement of my house and has been in use for approximately 20 months. After a few preliminary set-backs, which were corrected by some alteration in design, it has run without a hitch at a constant temperature, and literally thousands of fish have now been reared in it. At the moment of writing the pool is holding about 1,200 fish (average size  $\frac{1}{2}$  in.) consisting of Zebra Fish, other Danios, and various livebearers, and these are growing at a very fast rate indeed. A rough estimate of the cost of running this pool works out at a little less than £1 a month for the winter months. The pool itself is quite cheap to construct; all the materials needed were purchased for approximately £7. It took me about one month, unaided, to build in my spare time, but I am sure it could be built in a week or so by a more energetic person.

## Dimensions of the Pond

The rectangular pool measures  $8\frac{1}{2}$  ft.  $\times$   $4\frac{1}{2}$  ft.  $\times$  16 in. (internal dimensions). It is built in one corner of the basement, directly on a stone floor. The sides consist of a five-course high brick wall. The base, which is only 1 in. thick, was made by pouring in a sand and cement mixture (one part cement, three parts sand) after the walls had been erected. Two rows of bricks were laid roughly diagonally across the pool to create a flue which opens out on the two adjacent sides of the pool. The top of the flue (B) consists of a sheet of stainless steel which is laid on top of these bricks, the junction being made secure with "Black Magic", a proprietary aquarium glazing compound. The compound gives a flexible water-tight joint which allows the steel to expand and contract without starting a leak; this might occur if the steel sheet were firmly fixed to the brickwork with ordinary cement or other material. The short ends of the piece of steel ride over small pieces of asbestos cement sheets which are incorporated into the brickwork at the sides of the pool and are also cemented down into grooves on the top of the brickwork flue. Once more "Black Magic" intervenes between the piece of asbestos cement and

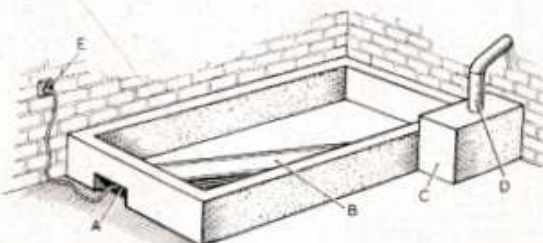


Diagram of the pool constructed in a cellar by Dr. Ghadially. A, gas heater; B, flue with stainless steel top; C, brickwork box connecting flue to chimney; D, chimney and E, gas inlet.

the stainless steel. Thus the whole piece of stainless steel rides freely on a cement and brickwork frame, supported and separated all along its length by the compound, from the brickwork.

One end of the flue is open as seen in the sketch. The other is led into a metal chimney (D) set in a brickwork box (C). In the picture the chimney is seen to pass through the wall of the basement; this was done to simplify the drawing, in reality it actually passes

some way up the chimney of an old-time fireplace in this basement kitchen.

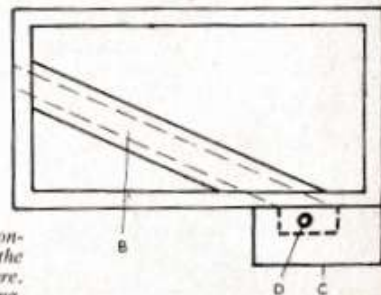
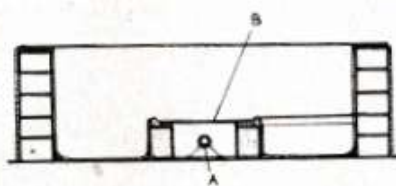
The inside and outside of the pool are faced with a 1 in. layer of one part sand and one part cement mixture. The interior was given two further applications of a creamy paste made of cement (no sand) and water. These were applied with a distemper brush. These coats of pure cement are very important as they render the pool waterproof.

As is well-known, water used to fill up a newly-made concrete pool soon becomes strongly alkaline. There are numerous well-known methods of curing this defect. As these have been adequately described in the past I will only briefly state the method employed by myself.

The pool was filled with water and allowed to stand for a few hours. A piece of litmus paper dipped into the water showed it to be alkaline (blue). Concentrated sulphuric acid\* was very gently added in small amounts and the contents of the pool stirred with a piece of wood. Addition of acid was stopped when the litmus paper turned red. Twenty-four hours later more alkali had seeped into the water from the concrete and the litmus paper again gave a blue reaction. More acid was added until the litmus paper turned red. This went on for about three days; each time the litmus went blue more acid was added. At the end of this period the reaction remained acid all the time.

On the fifth day the pool was drained and its walls scrubbed

\*This acid, employed for the purpose of reducing alkalinity, could be dangerous in the hands of the uninitiated. Sulphuric acid should always be added to the water and not the water to the acid. Not more than one or two cubic centimetres of acid should be added at any given time because of the heat generated and the danger of splashing. Alternative means of achieving neutrality should be used by beginners.



Above, a cross-section of the pool showing its construction. Right, a plan view indicating how the flue, with its stainless top, is built into the structure. The key is as in the upper drawing.



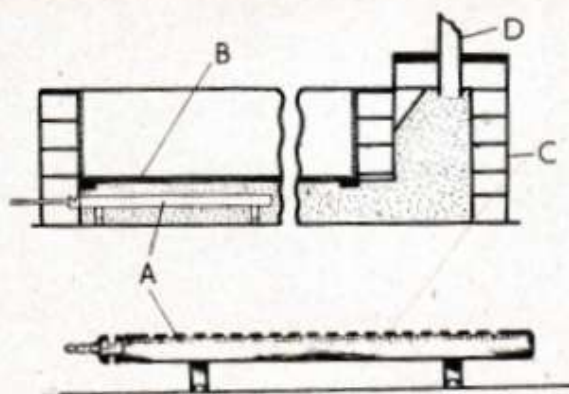
down with a stiff brush to remove the precipitate that had formed. The pool was filled up again and a small quantity of acid was added and the water allowed to stand for another three days. The pool was drained, rinsed and filled with water which was allowed to mature for 48 hours. A pH reading was taken and then the fish were introduced. Daily pH readings were taken for the next fortnight to detect any increase in alkalinity. A slight increase in alkalinity occurred during the period and was corrected by the addition of a very small amount of hydrochloric acid. The fish were not harmed in any way by this. Since then no further pH adjustments have proved necessary.

The heater (A) was made from a 2 ft. length of  $\frac{1}{2}$  in. iron pipe, plugged at one end: in the other end the air intake part of an old gas ring was welded on. Along the course of the pipe a row of  $\frac{1}{8}$  in. holes was bored, where the gas-air mixture emerges and can be ignited. Four pieces of metal were welded to the tube to form little feet for the burner which was connected to a gas tap by a rubber tube.

#### Igniting and Placing the Heater

The heater is ignited and placed in the flue after the pool is filled with water†. The flames coming from the heater play directly on the piece of stainless steel. The heat

†The burner is similar in principle to a domestic gas poker. The injector (in this instance, part of a gas ring), the size of the drilled holes and their spacing, the gas pressure, size of the tunnel, clearance above the gas flame and the characteristics of the flue appear to have been coincidentally and mutually suitable. Building a pond such as Dr. Ghadially has successfully constructed should prove practicable to a handyman, but advice should be sought from local Gas Boards before home-made burners are installed. We are informed that most Gas Boards have technical staff who will give advice on unusual applications of gas. Such advice is generally free and is willingly given.



Above, cross-section through the flue. Below, gas heater. A, gas heater; B, flue; C, brickwork box and D, chimney.

is rapidly conducted through the steel and dissipated to the water in the pool, which is in direct contact with it. A very efficient means of heat transfer is thus obtained.

The hot air in the flue also gives off its heat in the latter part of the flue and very little heat is lost up the chimney. Thermostats can be easily dispensed with when a large volume of water is to be maintained at a fairly constant temperature. Moderate daily fluctuations of air temperature do not affect the pool temperature to any extent, due to the slowness with which water loses and gains heat. With the change of the seasons,

however, small adjustments of the gas tap are necessary. During the whole time the pool has been in operation never have the fish been subjected to wide temperature fluctuation and the temperature has been so constant over such prolonged periods that I have not even bothered to take a reading for months now.

No gravel or plants are used in this basement pool because of the poverty of light in the cellar. Artificial electric lighting could be provided but the large wattage required to adequately illuminate the pool would be too costly. Water, fish and snails are the sole occupants of the pool at the moment. Sediment needs siphoning off about once every month and the water is topped up, as required, by a hose-pipe attached to a tap in this old cellar kitchen.

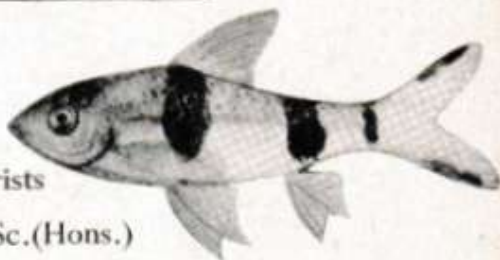
The only drawback of this pool, as compared with a glass tank, is that one cannot really see the beauty of the large shoals of fish, for a top view is not so satisfying as a side view. Except for this, from the sheer utilitarian aspect, the pool is far superior to any tank I have known for rearing fish. It is interesting to note in passing that, in spite of the fact that nothing equivalent to the cover glass of a tank is used, losses due to fish jumping out are almost unknown.

## Barbus mahecola

Taraporevala Aquarium, Bombay, Introduces

a New Barb Species to British Aquarists

By M. R. Ranade, M.Sc.(Hons.)



A NEW addition to the list of pet fishes is *Barbus mahecola*, popularly known as Indian Tiger Barb or Cola Barb. When the fish was first brought to the Taraporevala Aquarium, Bombay, by a fisherman, its coloration gave some faint indication that it might be a cross between *Barbus pentazona* and *Barbus nigrofasciatus*.

However, *Barbus mahecola* comes from India and is distributed from Bombay down the western coast and along the base of Nilgiris, Travancore hills and Ceylon.

#### Brightly Coloured Young Fish

Young specimens of *Barbus mahecola* are more gaily coloured than adults. The young fish show three black bands on the body and a half black band over the eye. The second band is the broadest, starting from anterior tip

of the dorsal fin and extending as far as the ventral fins. The third band is just above the anal fin and the fourth one is situated at the junction of the caudal peduncle and the caudal fin. All the fins carry red markings and the caudal fin is tipped black behind its bright red flecks. The general colour of the body is silvery white.

*B. mahecola* grows to 6 in., but its colouring fades after the fish attains 2½ in. The coloration of the adult is different from that of the young. The last two bands disappear and the third band transforms itself into a deep black oval mark on the lateral line extending from the fourteenth to the eighteenth scale. The fourth band disappears gradually.

The fish easily adapts itself to life in an aquarium and feeds on all types of live as well as dried foods. Nothing is known about its breeding habits as it has not been bred in aquariums so far.



*Crested or Great Warty Newt (Triturus cristatus). Left is a male with high toothed crest and, right, a female.*

## Amphibians and Reptiles of the British Isles

### 4. Three British Newt Species as Interesting Vivarium Occupants

By Alfred Leutscher, B.Sc.

**T**O complete the survey of *Amphibia* which are native to Britain, we have still to include the species which come within the tailed Order, called *Caudata*. This is a comparatively small group confined to the Northern Hemisphere, and universally known as salamanders. Other names are used in different countries, such as the term "newt" which is peculiar to the English language. Its etymology is not clear, but it could be a derivation of the old English "eft" which once embraced both newts and lizards, i.e., water eft and land eft. Indeed, early naturalists often confused the two, yet recognition should not be difficult. A newt, which is an amphibian, has a naked skin—a lizard, being a reptile, has a scaly covering. By saying "an eft" quickly we get the sound of n-eft. In modern spelling the w replaces the f, so finally we get "newt".

When out on land a newt may resemble a lizard, as the skin is often quite dry and dark. We can find it under logs and stones. Not a great deal is known about the newt's land existence, for its movements take place mostly at night. It must travel quite considerably, for water-filled bomb craters and newly-made ponds, which may be some distance from existing water, become mysteriously crowded with newts in a very short time.

Newts breed readily in the most unusual places—in aquariums, small pools, even in water troughs and rain butts. The babies hatch from eggs, and resemble the parents



much more closely than do the tadpoles of frogs and toads. By springtime the parents are in the water after their hibernation and are sluggish if the weather is cold and may even be buried in the pond bottom. If debris of leaves, etc., is dragged on to

*Female Smooth Newt (T. vulgaris), paler in colour and lacking the crest of the male. Colouring of this species is very variable.*

the bank, even as early as February, newts will sometimes crawl out. Some of them actually spend the whole winter there, beneath the water (a habit of frogs). Being amphibians they can all breathe through the skin, taking in what small amount of oxygen they require.

As the temperature rises, activity is resumed. It is then we notice the males pursuing the females, or rising gracefully to the surface to take a fresh supply of air. It is these movements and the bright colouring which make newts such an attractive subject for the aquarium. Breeding commences about April and may go on until July. There is no kind of embrace, or *amplexus*, as in frogs and toads,



*Photographs [L. E. Day] Male Smooth Newt with wavy crest along back and tail.*

but a curious type of courtship behaviour on the part of the male. The male in all three British newt species develops along the back and tail a distinctive crest, and may be recognised by this.

A male recognises a female by sight or scent and proceeds to undergo a lively courtship "dance". During these antics the back is arched and the tail curled round to face forwards. The extreme tip begins to vibrate rapidly. Readers who have kept newts are no doubt familiar with this, yet the purpose of the "tail wiggle" is not clear. It may take the form of sexual excitement on the male's part, as a means of attracting a mate. It has even been suggested that the male exudes a perfume, which is then driven towards the female in a current of water set up by the lashing tail.

The result of all this is that the male will deposit a small, whitish object, called a spermatophore. It is a cluster of many active sperms which comes to rest on the pond bottom. I have managed to observe this in the aquarium. The female then crawls over it and with her hind feet presses it against her cloaca. The sperms then ascend into her body, where from time to time the eggs are fertilised before they are laid. This unusual reproduction seems to be unique

in the Animal Kingdom, and confined to the salamanders in general. Later on the female deposits her eggs here and there among water plants. The British newt normally selects a leaf and cups it with her feet. When the egg is laid it adheres with the jelly-like coating, and the mother usually folds the leaf around it for added protection.

#### Observing the Breeding Behaviour

All this interesting behaviour has been carefully observed in the aquarium, for it is not difficult to keep and breed these creatures. In some ways they are rather stupid. A male will often "court" another male, or a female from a different species. So far as is known the British newts will not hybridise. I have managed to induce the "tail dance" by using imitation models of female newts held in the tank. To my surprise a newt once "courted" my finger when I held it below the water!

Newts become exceptionally tame, and will soon take meals from the fingers. They will also snap at a moving finger in an attempt to swallow it. One method of catching them is to dangle a garden worm on the end of a piece of cotton in the pond. No hook is required.

The baby newts hatch in a week or so, and retain their gills until metamorphosis which takes place about 2½-3 months later. They then breathe air into their newly-formed lungs, and crawl out of the water. Those larvae which hatch late in the season may "overwinter", and remain with gills until the following year. At this early age the different species cannot always be identified, and sexing is impossible without dissection. The adults, however, should not give much trouble.

Our largest species is the Crested or Great Warty Newt (*Triturus cristatus*) and it grows to six or seven inches. It is a deep olive brown, almost black, blotched with darker marks, and speckled with white along the flanks. The belly is marked with yellow or pale orange spots. During the breeding season the male carries a high, toothed crest, which gives it the appearance of some prehistoric monster in miniature. It is quite harmless. The female may show a yellow or orange line along the middle of its back although this is not present in all specimens.

There are various Continental races of this species, often for sale in shops under a number of names, such as Triton, Italian Newt and even Salamander. The European Salamander (*Salamandra salamandra*) is glossy black and yellow and is an entirely different amphibian. The distribution of the Crested Newt in Britain is widespread but here and there it is absent, especially from ponds near large towns, where it is a favourite with the school children and has little chance of survival.

#### Common Newt (*Triturus vulgaris*)

The Smooth or Common Newt (*Triturus vulgaris*) is far better known. It grows to about four inches, and colour varies greatly, from brown to olive, even reddish, marked with deeper spots which are large in the male and small in the female. The underside is whitish to yellow or rose with a median area which is red or orange. On this are black spots which are small and even absent in the female. The throat is also mostly spotted.

This species is widespread but less common towards the

west. The Smooth Newt is the only species found in Ireland, where it is known as the Man-keeper. There is a quaint belief that if one sleeps upon the ground near water, with one's mouth open, a newt is liable to crawl in. When drawing water from a well it is advisable to keep the mouth shut!

The small Palmate Newt (*Triturus helveticus*) grows to about three inches. Whilst breeding the male develops a low, straight crest, and black webs between the toes. The tail ends in a curious fine thread. The female can easily be confused with a small Smooth Newt. The way to recognise it is by the squarish body, and the absence in most specimens of spots on the throat. This area, in both sexes, is a clear, creamy white. The general colouring of Palmate Newts is olive-brown, marbled rather than marked with darker spots which tend to form rows of tiny spots along the tail.

#### Keeping Newts in an Aquarium

Keeping newts in the aquarium is a fascinating pastime. The usual aquarium set-up, with sand and plants, etc., is quite suitable except that some kind of land space is required so that the little creatures may crawl out from time to time. This is provided in a number of ways—floating cork or wood

being the simplest. Another way is to place flat stones or slate on a foundation of rocks, or on an upturned flower-pot. The platform itself is not sufficient, as the newts like something to crawl under. A "roof" can be made with a piece of raised slate or bark.

When entirely terrestrial, after the breeding season, the newts can be transferred to a vivarium, which must provide the humid conditions which they enjoy. A converted aquarium will do, or a fern cage, in which shade- and moisture-loving plants can be grown. Rocks, bark and loose branches arranged here and there will provide the necessary cover. A little ingenuity and careful planning can produce a most attractive home which will be no disgrace to any room. A more satisfactory and permanent arrangement is the so-called aqua-terrarium, in which the aquarium is combined with a miniature garden. The animals can then enter and leave the water as they choose.

To rear newts it is best to remove the plants on which the eggs are laid to a separate receptacle containing shallow, well-matured water. The youngsters will grow up on a graded diet of Infusoria, *Daphnia* and *Tubifex*, as in the case of fish fry, remembering that newts are carnivorous throughout their lives. The adults will take *Daphnia* and *Tubifex* in addition to small garden worms, slugs and insect larvae. They feed both in and out of water. Larger specimens should be kept away from smaller ones, as one may eat the other.

#### Feeding on Raw Meat

Many newts will also take raw meat or fish in small pieces, which is about the only kind of non-living food suitable for them. They should be handled as little as possible and then only after wetting the fingers. Occasionally they pick up fungus complaints, which are either due to poor health or dirty surroundings. There is no reason why they should not live many years in captivity when kept under the conditions outlined in this article and some records go up to twenty-five years.



Photograph

[L. E. Day

Male Palmate Newt (*Triturus helveticus*) showing the unusual "thread" at the termination of its tail.

## Notes for Novices (10)

## Marginal and Marsh Plants

**I**F Water-lilies, discussed in the last issue, offered a bewildering selection to the beginner, then marginal and marsh subjects are even more confusing. The varied species are extremely numerous so no attempt will be made to cover them all. Rather, a selection will be made from those which are easy to cultivate, are readily obtainable, and are suited to the amateur's pond where space is at a premium.

First, the plants are listed which live in a shallow depth of water, and are favoured because of the beauty and diversity of their aerial foliage and flowers. Then some of the subjects which do well in a marshy area at the pond border will be mentioned. Certain types, it will be noted, thrive in either a marshy situation or a shallow water depth.

*Aponogeton distachyum* (Water Hawthorn) has floating leaves and its spikes of white flowers appear above the water surface. They are scented. Water depth can be from 6-12 in. Planted in 9-15 in. depth of water the Water Violet (*Hottonia palustris*) bears its lilac flowers up to 12 in. above the water surface although the leaves are submerged. Doing best in about 4 in. of water the 3 ft.-high Flowering Rush (*Butomus umbellatus*) has rose-pink flowers which contrast well with the typical rush-like foliage.

### Three-lobed Leaves of Bog Bean

The Bog Bean (*Menyanthes trifoliata*) will flourish in marshy situations and also in water depths of up to 4 in. The leaves are three-lobed whilst the flowers are pink with white centres. Another subject which grows in shallow water or in a marshy situation is the Water Forget-me-not (*Myosotis palustris*). It appreciates a certain amount of shade. In depths of 3-5 in. *Pontederia cordata* is recommended. Not ungainly in growth it attains a height of up to 2 ft. The flowers are blue and the dark green leaves are smooth and glossy. Water Crowfoot (*Ranunculus aquatilis*) does well in 6-12 in. of water. Two types of leaves are borne, the submerged, hair-like, and the floating, three-lobed. *Ranunculus lingua* var. *grandiflora* is a striking plant in shallow water. The large buttercup-shaped and coloured flowers make a proud show from mid-summer to autumn. Height is up to 1½ ft.

The plant usually but incorrectly known as the Bulrush is *Typha latifolia*. It is more correctly called the Great Reed Mace. Characteristics are the spiky leaves, light brown flowers and dark velvety-brown pistillates. Plants grow best when set in 6 in. of water. They reach a height of 4 ft. This species grows rampantly and should only be set in a large pond. A dwarf species is *Typha minima* which grows to 12 or 18 in. and needs a water depth of 4 in.

### Acorus Species

Several species of *Acorus* are well suited to either shallow water or the damper areas in a marsh garden and their main attraction is the foliage which is not dissimilar to that of Irises. Two bearing variegated leaves are *Acorus calamus* var. *variegatus*, which grows to 2 ft., and *Acorus gramineus* var. *variegatus*, a dwarf variety not exceeding 9 in. Both have their green leaves marked with cream-white.

A number of the Irises prefer a marshy situation rather than actual submersion in shallow water but exceptions are *I. laevigata*, *I. pseudacorus* and *I. versicolor*. *I. laevigata* should have a 4 in. water depth when it grows to approxi-

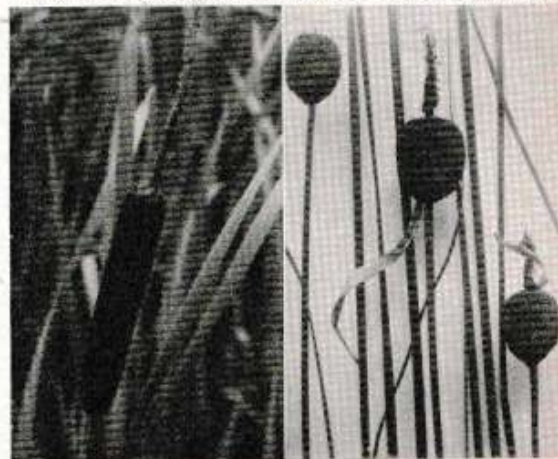
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Photographs [L. E. Perkins and L. E. Day]  
*Pontederia cordata*, left, and (*Hottonia palustris*), right.



Photographs [H. Bastin]  
Bog Bean (*Menyanthes trifoliata*), left, and Flowering Rush (*Butomus umbellatus*), right. The flowers of both are pinkish.



Photographs [L. E. Perkins and H. Bastin]  
Great and Dwarf Reed Mace (*Typha latifolia* and *minima*).



Photograph] (H. Bastin)  
The Yellow Flag (*Iris pseudacorus*), a rampant grower in shallow depths of water.

to 2½ ft. in 4 in. of water, *I. versicolor* bears violet-coloured blooms and spreads rapidly.

Pink and white flowers are developed by the Water Plantain (*Alisma plantago*) which prefers water about 8 in. deep. If put in too great a depth it may not produce flowers. The leaves are broad and comparable in shape to those of broad-leaved land Plantains.

#### Unusual Leaf Formation

In very wet areas of the marsh or in shallow water the Umbrella Rush (*Cyperus longus*) can be grown. At the end of the 3 ft. high stems leaves are arranged to give the appearance of ribs in an umbrella.

Waxy leaves, dark green above and silvery below, are produced by the Golden Club (*Orontium aquaticum*) which will live in water depths of up to 15 in. The flowers are yellow, small, but densely packed and are borne quite early in the season.

#### True Marsh Plants

Among the true marsh plants there are two Irises worthy of a place—*Iris sibirica* and *Iris Kampferi*. They like a position in the full sun and the advantage of including both



Photograph] (E. E. Dennis)  
Blossoms of the Double Marsh Marigold (*Caltha palustris* var. plena).

mately 18 in. The species bears deep blue flowers although amongst its varieties, *Rose Queen* has pinkish blossoms, *alba*, white, and *variegata*, light blue with variegated foliage. *I. pseudacorus* is larger and is not suited to small ponds. It usually grows to about 3 ft. and requires a water depth of 6-8 in. The flowers are yellow, like those of its variety *variegata*, the latter having yellow-striped leaves. Growing

species is that *I. sibirica* flowers in early summer, whilst *I. Kampferi* blooms in June and September. *I. sibirica* var. *Emperor* has large violet flowers, var. *Perry's Blue*, light blue blossom and var. *Snow Queen*, clear white, borne slightly shorter than the others. *Iris Kampferi* is an established favourite. All its readily-obtainable varieties are in shades of violet.

The various pondside Primulas require a damp but not excessively soggy situation out of the full glare of the sun. They grow from 9 in. to 3 ft. tall and offer a wide range of colours in their blossoms. The flowers of *Primula aurantiaca* are orange-red, those of *P. Beesiana*, carmine, of *P. Bulleyana*, yellow-orange, of *P. denticulata*, lilac, of *P. denticulata* (Ruby variety), deep red, of *P. Florinda*, yellow, of *P. japonica*, crimson, of *P. pulverulenta*, crimson, of *P. rosea*, rose, and of *P. sikkimensis*, pale yellow.

#### Two Trollius Varieties

With flowers resembling those of a buttercup but larger in size the several varieties of *Trollius* make attractive additions to the bog garden. The Golden Queen type has brilliant orange blossoms and Orange Princess deep orange ones.

The Blue Poppy (usually *Meconopsis Baileyi*) is enjoying



Photograph] (H. Bastin)  
Water Crowfoot (*Ranunculus aquatilis*) showing the three-lobed floating leaves and buttercup-yellow flowers.

a run of popularity just now and certainly it is deserved. No other poppy and very few other flowers have the clear sky-blue colouring of this Genus. It will grow in a flower border but should do well at the edge of a marsh where the ground is not watered excessively.

The Bog Arum (*Calla palustris*) has heart-shaped leaves and a white flower. In the autumn red berries develop.

Having a somewhat similar scientific name but not to be confused is the Marsh Marigold (*Caltha palustris*). The species has bright yellow flowers which in its variety *plena* are double. The species *C. polypetala* is larger and can get out of control if not rigorously thinned out.

Another plant with arum-like flowers which are white is *Lysichitum camtschatcense*. The species *L. americanum* has beautiful yellow flowers but both have an offensive odour.

This résumé of marginal and marsh plants forms a cross-section of the various types which can be had readily. Specialists in this field have many additional species in their collections and their catalogues give useful information.

In the next issue consideration will be given to stocking the new pool with fish and the merits of Goldfish varieties and native coldwater species discussed.

# "The Compleat Aquarist"

New Angle for Fishkeepers on the Seventeenth Century Naturalist and Philosopher

—W. L. Mandeville Proves a Modern Disciple of Izaak Walton

**W**HEN a human being becomes associated with fishes, the association appears to come under one of three clearly defined categories. Fishermen—employing every method to catch the maximum amount of fish for food. Anglers—using any device to make the catching of fishes more difficult; and Aquarists—human beings caught by fishes and made their servants for life. Sometimes these two latter activities are enjoyed together, but it is not long before one activity predominates. When the angler becomes an aquarist, the rods lie idle for longer and longer periods, and the landing net is adapted for the collection of *Daphnia*.

## Born in Stafford

The aquarist who becomes an angler is a rarity and, had Izaak Walton lived today, instead of honouring Stafford with his birth on August 9, 1593, he would most certainly have joined the ranks of the aquarists. Had his major work been called "The Compleat Aquarist" instead of "The Compleat Angler", the valuable information contained in it would have been more widely studied by aquarists.

Although an authoritative angler, Walton's interest in living fishes, his delight in the varying moods of the English countryside, and even in the vagaries of our weather, together with his fondness for companionship—including "the stoup of ale," make it obvious that the catching of fishes was incidental. "I would you were a brother of the angle," he writes, "for a companion that is cheerful and free from swearing and scurrileous discourse is worth gold. I love such mirth as makes friends not ashamed to look upon each other in the morning. Nor men that cannot well bear it, to repent the money they spend when they be warmed with drink. And take this for a rule; you may pick out such times and such companies that you make yourselves merrier for a little than a great deal of money, for 'tis the company and not the charge that makes the feast." No better plea for membership of an aquatic society could be written. But Walton is also practical. Biological students, remembering those lectures on the distribution of animals, designed to teach, among other things, that if a living organism cannot move from where food is not to where food is, it will perish, will delight in the economy of words on the same subject. In Walton's instructions for the management of ponds:—

"If your ponds be not very large and roomy, see that you often feed your fish by throwing into them chippings of bread, curds, grains, or the entrails of chickens, or of any fowl or beast that you kill to feed yourselves. . . Note that Carps and Tench thrive and breed best when no other fish is put with them into the same pond. . . And note, that clods of grass thrown into any pond feed any Carps in summer; and that garden-earth and parsley thrown into a pond recovers and refreshes the sick fish".

Here is good information for the Goldfish breeder. The tropical fancier can also learn that the crystal clarity, so much admired in his tanks, may not be a virtue. Both fanciers should note the emphasis on edible green food—so rarely mentioned in suggested

foods, so essential for the health of many fishes, and so easily provided in Duckweed, crushed lettuce, or Izaak's parsley.

His many recipes intended for baits and ground baits are also good recipes for prepared foods. What fish could fail to thrive on this? "Take a handful or two of the best and biggest wheat you can get, boil it in a little milk like as frumety is boiled, boil it so till it be soft, and then fry it very leisurely with honey and a little beaten saffron."

A modern short cut to the same result is to mix a teaspoonful of dried full-cream milk into an eggcupful of Bemax, and stir in a teaspoonful of warmed honey. A further hint of diet deficiencies can be detected when he says—"Nay, mulberries and the blackberries that grow upon briars be good for Chubb or Carps where such trees have grown near the water and the fruit customarily dropped into it."

That great maxim, "Livefood only," essential for some fishes and for many reptiles, is adequately answered by the instructions given in "The Compleat Angler" for collecting and storing "Ants and flies and other small insects," together with breeding methods for worms and gentles.

## Preparing Breeding Tanks

It was from Izaak Walton that one of the most effective breeding tanks for tropicals or Goldfish varieties was culled. The method consists of layering the tank with fine shingle (as supplied for aquarium compost) then pouring water into the tank until the compost is just covered; the surface of the compost is then sprinkled with grass seed which is allowed to germinate and grow before filling up the tank for breeding. The method fails if the tank is inadequately lighted—a common failing with many tanks—but, when the grass has grown, it provides an ideal egg-trap and the gradual disintegration of the grass when fully submerged supplies ample Infusoria for rearing.

(Continued next page.)



Brookfields' Old Mill from Izaak Walton Walk. Photographed by A. L. P. Roxbee

This hint came from Izaak Walton's instructions on pond maintenance, "You are to cleanse your pond, if you intend either profit or pleasure, once every three or four years, especially some ponds". (What a picture comes to mind from that "especially some ponds"!!! Dare we suggest "tanks" also?)—and then let it lie dry six or twelve months, both to kill the waterweeds as water-lilies, candocks reate, and bulrushes, that breed there; and also, that as these die for want of water, so grass may grow in the pond's bottom, which Carp will eat greedily in all the hot months". Walton's ponds were excavations made to hold water by compacting the earth with clay, and the suggested treatment, always of value to large natural ponds, can be usefully adapted for the smaller modern pools contained in concrete.

His details for breeding Carp read like a poem, "It is observed that the best ponds to breed Carps are those that be stony or sandy and are warm and free from wind; and that are not deep . . . Carps begin to spawn at the age of three years, and continue to do so till thirty . . . in the time of their breeding, which is in summer when the sun hath warmed both the earth and the water, and so apted them also for generation, that then three or four male Carps will follow a female; and that then, she putting on a seeming coyness, they force her through weeds and flags, where she lets fall her eggs or spawn, which sticks fast to the weeds, and then they let fall their melt upon it, and so it becomes in a short time to be a living fish."

This precision of observation brings Izaak Walton's assumptions into sharp relief, and how he would have revelled in the current correspondence on spontaneous parthenogenesis in WATER LIFE, for he tells us, "You are to know that there are so many sorts of flies as there be of fruits; Pliny holds an opinion that many have their birth or being, from a dew that in the Spring falls upon the leaves of trees; and that some kinds of them are from a dew left upon herbs or flowers, and others from a dew left upon Coleworts or cabbages; all of which kinds of dews being thickened and condensed, are by the sun's generative heat most of them hatched and in three days made to become living creatures."

#### Discourse on Pike

Of Pike, he writes, "'tis not to be doubted but that they are bred, some by generation, and some not: as namely, of a weed called Pickerel-weed . . . this weed and other glutinous matter, with the help of the sun's heat in some particular months, and some ponds apted for it by nature, do become Pikes . . . or are brought into some ponds some such other ways as is past man's finding out." But he is most conclusive when he mentions Eels, "But most men differ about their breeding: some say they breed by generation as other fish do; and others, that they breed, as some worms do, of mud; as rats and mice and many other living creatures, are bred in Egypt by the sun's heat when it shines upon the overflowing of the river Nilus . . . Those that deny them to breed by generation as other fish do, ask, If any man ever saw an Eel to have spawn or melt? . . . And others say, that as pearls are made of glutinous dew-drops, which are condensed by the sun's heat . . . so Eels are bred of a particular dew, falling in the months of May or June on the banks of some particular ponds or rivers, apted by nature for that end; which in a few days are by the sun's heat turned into Eels . . . and yet it is affirmed by some for a certain, that the Silver Eel is bred by generation; but not by spawning as other fish do, but that her brood come alive from her, being then little live Eels no bigger nor longer than a pin: and I have had too many testimonies of this to doubt the truth of it myself; and if I thought it needful I might prove it, but I think it is needless." We may smile at some of the inaccuracies of the sixteenth century, but some of our "truths" may cause laughter in the year 2253.

Although this article is written for the holiday mood—the deck-chair rather than the fishhouse—the practical

intention is to stimulate interest, and to direct your studies to sources such as "The Compleat Angler". Many of us will agree with Izaak Walton's conclusion, "I envy not him that eats better meat than I do, nor him that is richer or that wears better clothes than I do. I envy nobody but him and only him that catches more fish than I do." We should probably substitute "keeps" for "catches", but even as it reads, the character of the man is clearly defined, and we could do worse than to copy him.

## Systematic Study of Pond Life

Making a Preliminary Examination of  
the Occupants and Their Disposition

By John Clegg, F.R.M.S.

**T**HERE must be many aquarists and pondkeepers who, although attracted in the first place to their hobby perhaps by the decorative effect of tropical fish or the ornamental value of a pond in their garden, have had their interest awakened in aquatic matters generally. Their approach may be practical. In which kind of pond can *Daphnia* be found? Why does my pond go green in spring? On the other hand a genuine and objective desire for further knowledge may have been stimulated and I have been delighted to find among many members of aquarists' societies who have visited me at the Haslemere Educational Museum a keen desire to know more about the creatures and plants which live in ponds and streams, and the conditions under which they exist.

Now it seems to me that any aquarist or pondkeeper who is prepared to devote a little time and study in this direction is inevitably going to profit in his hobby and so, in the next few issues, I am going to deal with various aspects of pond life and particularly to suggest a more systematic approach than is usually adopted.



Magnified photograph of  
the crustacean, *Daphnia*.

It does not lead very far merely to go and dabble haphazardly in the nearest pond, see what comes out of the lucky dip, throw the whole lot back again and then go home satisfied that we have studied that pond. We must from the outset regard the pond—any pond—as an almost self-contained community of plants and animals and find out, not merely what live there, but their relations one to the other and to their environment.

Naturalists of days gone by called this study the natural history of the pond, but nowadays we give it a much grander title—the ecology of the pond, ecology being a word derived from two Greek words, *oikos*, a house, and *logos*, discourse, hence the study of an environment. In studying the ecology of a pond, or any other habitat, what we are really trying to do is to find out the answers to five questions:—what? where? when? how? why? In this first article I shall confine my remarks to showing how we can set about answering the first question, "What

lives in the pond?" and the other questions must wait for subsequent issues.

"What?" of course, means "which species" or what community of species. In freshwater generally—ponds, lakes, ditches and streams—there are representatives of almost every major group of living organisms, from bacteria to higher, flowering plants and from simple single-celled animals such as *Amoeba* to the highly-developed backboneed animals. Of course, no one pond would yield examples of every group, but even quite small ponds can muster a surprisingly high total. It may be worthwhile to list the main groups which could conceivably be encountered in freshwater habitats:—

**PLANTS**

- Simple plants—bacteria, algæ, fungi
- Flowering plants

**ANIMALS**

- Single-celled animals—*Amoeba*, *Paramecium*, etc.
- Sponges
- Hydra*
- Flatworms—Planarians, flukes
- Roundworms—threadworms
- Rotifers—the so-called "wheel-animals"
- Polyzoons—"moss animals"
- True worms—relations of the Earthworm, leeches, etc.
- Arthropods—that is, "jointed-footed animals" including the following:—
  - (a) Crustaceans (Water-fleas; Freshwater Shrimp; Crayfish, etc.)
  - (b) Insects of the following groups—springtails, stone flies, mayflies, dragonflies, water-bugs, alder flies, caddis flies, aquatic moths, beetles, two-winged flies, ichneumons.
  - (c) Spiders and Mites
- Molluscs—snails and mussels.
- Vertebrates—fish, frogs, toads and newts.

It will be realised that there is plenty to be getting on with if we find only half of these groups represented in our pond!

**Making a Survey**

Let us assume that we are going to make an ecological survey of our chosen pond. The first step, which will help us later, even if our interests are primarily in the animal life of the pond, is to make a rough sketch map of the pond as nearly to scale as possible, and then to mark in with any convenient symbols the position of different communities of water plants. Thus a series of circles could indicate the extent of a patch of Water-lilies; crosses the position of Canadian Pondweed and so on. Do make a note on the map of what each symbol indicates! It will be found that on the completed map the plants will probably be arranged in zones: The floating plants such as Duckweeds, which stretch towards the centre of the pond; the submerged plants and those rooted plants which have floating leaves near the margin; and the swamp plants, such as the reeds, in the shallows. These zones are important and will be discussed in more detail in a later article.

After the vegetation has been charted, collection of



Enlarged picture of a Leech species, *Piscicola geometra*, likely to be found in ponds and streams. Photographs by J. Clegg.

the animal life can begin. The equipment for pond-hunting has been dealt with in detail in my recent series of articles in WATER LIFE (February, 1952-June, 1953) and need not be discussed again. But the important thing is that collecting should be not merely wielding a net casually at the edge of the pond, but should be carried out in every type of habitat—at the surface, in the bottom mud, under stones, in each of the plant zones and from the middle of the pond (by means of the pond tow-net). The catch from each area should be kept separate and labelled appropriately. Only by such thorough and systematic collecting can any real idea of the life of the pond be obtained, and the results will surprise those who have so far contented themselves with casual collecting.

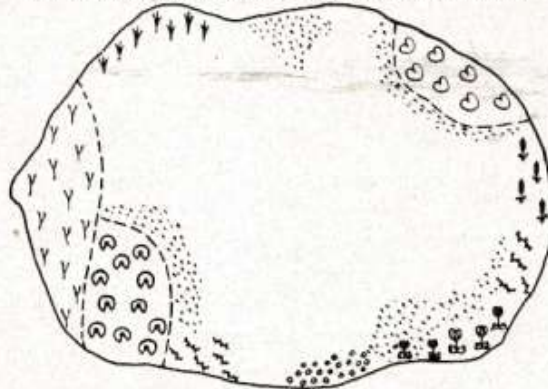
On arrival home the material from each area must be dealt with in turn. By pouring it out into large flat white dishes, such as large pie-dishes or photographic dishes, and letting the sediment settle the various organisms will be clearly visible. A fountain pen filler and a small paint brush will help in transferring the creatures into smaller vessels, such as saucers or cups—each kind to its own vessel. Then, using as labels slips of paper bearing the names of the groups given above, arrange the small receptacles in order on a table. If your collecting has been thorough and the pond reasonably productive, you will be surprised and gratified at the large number of groups that are represented.

In the earlier stages of the study it will be enough to be able to affix general labels, such as "dragonfly nymphs," "water beetles" and so on and the pictures in my two WATER LIFE booklets "Aquatic Insects" and "Pond and

Stream Life" will help you to do this. Later you will want to identify the various kinds more exactly and this will necessitate the use of more advanced text-books or identification keys. No doubt your local public library will have such books, possibly in its Reference Department. Inexpensive keys to many groups are issued by the Freshwater Biological Association, Ambleside, Westmorland, and can be obtained from them at a cost of about 1/6d. each.

The methods outlined above may suggest to school-teacher readers of this journal a possible scheme of work for the nature-study class and in succeeding articles in this series I shall endeavour to describe methods which have been found particularly suitable, in my experience, for students.

Rough Sketch Map of a Pond Showing its Plant Life



**KEY**

- ↓ REEDS
- Y SWEET FLAG
- ⊙ WHITE WATER LILY
- ⊖ YELLOW WATER LILY
- ↓ REEDS
- ⊗ CANADIAN POND WEED
- ⊙ FROGBIT
- ⊙ DUCKWEED
- ⊙ MARSH MARIGOLD



# Indian Hobbyist's Asian Tour

Five Far-Eastern Countries Visited by  
Secretary of the Indian Aquarist Society

**M**R. M. MANAL, secretary of the Aquarist Society of India, made a trip covering Siam, Hong Kong, China, Japan and Singapore in the autumn of last year. He left Bombay for Calcutta by air on September 25. The Calcutta members of his society gave him a very cordial welcome and, whilst in Calcutta, he learnt a great deal about the local fish obtainable there. He was very surprised to hear that some people eat both Zebra and the Glass Fish. About a couple of thousand fish suffice for one meal.

From Calcutta Mr. Manal flew to Bangkok, thrilled at the prospect of seeing Siamese Fighting Fish in their natural haunts. He went out on a collecting expedition but was very disappointed with the wild Siamese Fighter and found it a very plain looking fish, rather like the Indian Paradise Fish. Professional breeders use the wild *Betta* to strengthen a strain by crossing them with aquarium varieties. Mr. Manal also saw plenty of Blue Gouramies, many of which had made huge bubble nests.

Though fishkeeping is quite a popular hobby in Bangkok there are no shops or large dealers of aquarium fish. All the fish are sold by roadside hawkers who exhibit their varieties of Goldfish in large, flat pans. As the entire city is built on canals and waterways, mosquito larvæ are always plentiful. These are collected by the hawkers of fish who sell them as livefood. Mr. Manal was extremely interested in the method of packing fish and larvæ that is employed by these street hawkers. The customer never brings a container and all the seller does is to take a large lotus leaf, put into it a little water and the fish purchased, tie up the leaf like a little bag and hand it to the customer. The local Siamese who transport their purchases home in this way

*Mr. Manal, whilst in Malaya, spent some time searching for new aquarium fish in natural waters. Here he is seen (in the foreground) on one of these trips.*



say that the fish always live. The plants in this area of Siam were found to be similar to those growing around Bombay in India.

The hobby is not organised in Siam and there are not a great number of aquarists, very few varieties of aquarium fish available and no society in existence.

### Popularity of Goldfish

From Bangkok Mr. Manal went to Hong Kong, where the population is mainly Chinese. Goldfish are the most popular fish. At the time of the Chinese New Year thousands of Goldfish are sold throughout the city in little bowls. The Chinese consider it most auspicious to take them home, though the fish's life could not be very long in its confined home.

There are numerous aquarists and many of them find no difficulty in breeding Angels and Black Widows. The Chinese seem adept at distinguishing the sexes of Angels. They maintain that the male has a more roundish body than the female and also a larger mouth. To induce the fish to spawn they introduce into the otherwise bare 5 ft. breeding tank a single leaf of *Philodendron*, also known as the Evergreen Plant. The leaf is tied to a piece of wire and anchored to a cement concrete block or to the cork of a coloured bottle weighted with sand. Certain breeders use a small flat glass table in the aquarium to induce the fish to spawn. Some aquarists told Mr. Manal that from one good pair of Angels they could get 600-700 young ones 15 to 20 times a year, i.e., 9,000 to 14,000 young in a year!

To breed small egglayers moss is used as a spawning medium. Mr. Manal was told that a good pair of Black Widows spawns about 10 times a year and produce 700-800 fry each time.

Both *Daphnia* and *Tubifex* are popular livefoods. *Daphnia* is sifted through 100-mesh netting for the fry during the first week. *Tubifex* is very extensively used for adult fish. *Tubifex* are stored by first being cleaned and then kept in flat trays without water. Once every two or three hours the mass of worms is dipped into water. The worms seem to survive this treatment.

Mr. Manal was fortunate in being able to motor out to a Goldfish hatchery near Canton. The breeding method adopted at this hatchery is to



*A native woman manipulating one of the strangely-shaped nets used for catching fish in the waters of the Malay Peninsula.*

introduce a ripe pair of fish to a large earthenware container and then to remove them after spawning. The young are transferred to shallow ponds about 6 in. deep. After three or four weeks they are transferred to ponds about 20 ft. long and 9 to 12 in. deep. It was learnt that a Chinese doctor had bred Neons and when Mr. Manal visited him he had 400-500 fry.

**Very Few Tropical Fish**

From Hong Kong the trip was made to Japan and it was surprising to find that in this country there were hardly any tropical fish available. Japan specialised in Goldfish varieties before the war but during the war the Government put a ban on breeding fancy fish and most of the good breeding specimens were presumably eaten during the food shortage. It will probably take three or four years to get the Goldfish trade going in full swing again.

Several Goldfish hatcheries near canals were visited and it was interesting to find such simple, inexpensive methods of construction. There was little or no masonry or cement work and the hatchery looked like a paddy field in the monsoons. The hatcheries produce large numbers of fish at cheap prices, which are mainly for the export market. The food for the fish is mainly cooked oatmeal.

**Fish Motifs Used**

Mr. Manal was pleased to find the aquarium fish motif a very popular one in Japanese *objets d'art*. He was able to buy a beautiful large aquarium clock, a Goldfish clock, fish lamps and innumerable articles made from shells and mother-of-pearl. From Japan he turned back to Singapore and saw several of the local fish such as Glass Catfish, Rasboras and Kuhli Loaches.

One of the most interesting personalities Mr. Manal met on this trip was an elderly European who goes around the world in a specially-equipped boat, collecting fish. He has done this job for over twenty years and loves it.

When he was visited on the ship there were 50 to 60 thousand fishes on board. He told Mr. Manal that transporting fish was by no means easy. This European spoke of the time when he spent six months in the Amazon waters looking for Neon Tetras but without any success. When he was about to leave in despair, a native, who saw his sample specimens, led him to a place from where he was able to collect thousands of them. He also spoke of one lucky day when he netted twenty-two *Symphysodon discus*; after that he rarely found one or two.

On the homeward flight Mr. Manal met an American bound for Dahrain and he became so interested in the hobby that before parting he had been enrolled as a member of the Indian Society.



A young roadside hawker in Bangkok with Goldfish, Tubifex and mosquito larvae.

(The "catch" of over twenty Pompadours in one day compares favourably with those reported on page 195.—Ed.)

## "Fish Fantasy"—Second Show in Bombay



Above: Shri Morarji Desai, Chief Minister of Bombay, being taken round the exhibition by Dr. K. T. Gajjar, the society's President. Right: His Excellency the Governor of Bombay delivering the opening address of the three-week show. To his right is Dr. Mrs. R. M. Captain, and to his left, Shrimati Bajpai, Mr. Manal (secretary) and Mr. G. F. Pereira. The Chief Minister accepted an invitation to become honorary patron to the club.

THE Anjuman School Hall in Bombay, decorated to give the impression of an underwater cave, was the scene for The Aquarist Society's of India second annual "Fish Fantasy" Show. Among exhibits were an Octopus, a baby crocodile, Sea Anemones, Water Snakes, Angel Fish which reared a brood of youngsters and Blue Gouramies which spawned, a male Leeri taking over care of their eggs and young.



## Fishes from West African Waters

**B** RITISH NIGERIA on the West African coast derives its name from one of the largest rivers in Africa. It is the mighty Niger which traverses the colony in a wide arc. The fact that a large number of ornamental fish species live there aroused the interest of ichthyologists many years ago and quite a few species were imported into European countries.

The fish fauna throughout Africa is particularly rich in strange forms. Contrary to the wealth of different species that find their way to Europe from Latin America and the Far East, the number of African types which have acquired permanent citizenship in our aquaria is surprisingly small. This is probably due to the great amount of care which must be devoted to the most beautiful Genus, the vividly-coloured *Aphyosemion* with their many highly diverse shapes and forms, so that they are almost always found only with experienced ichthyologists interested in research work.

### Distinctive Behaviour and Appearance

The same is true of many other African species so it is not surprising that only amateurs capable and willing to take upon themselves the special effort required to keep and raise this type of fish, or systematic collectors, turn to them, attracted by their frequently greatly differing behaviour and appearance. I hope to cover some of these peculiar yet fascinating African species in this series of articles.

In the heavily-overgrown tributaries of the coastal rivers, and quite often even in the water courses of the mangrove thickets where seawater and brackish river water change frequently, keen-eyed fishermen look for a small dark-coloured, strangely-shaped fish. They search the hopelessly entangled mass of aquatic plants in their catchers or the high banks of rotting leaves along the wooded shores. Its colour and odd shape justify its name, African Leaf Fish (*Polycentropsis abbreviata*). The fish reaches an overall length of about 8 cm. (3 in.), the body is high with characteristically flattened sides. Its colour, which may be varied at

### Leaf Fish (*Polycentropsis abbreviata*) with its American Relatives and *Epiplatys grahami*

will, ranges from light to dark olive-brown with darker shadows and barely visible dark transverse bands. Three dark brown lines go right across the eyes. The spiny parts of the dorsal and anal fins have the colour of the body whereas the soft sections of both fins, and also those of the tail which are arranged in the same plane, are transparent, giving an immediate impression that they are non-existent. The large head, with the watchful eyes, and the deeply-cleft mouth tell us that here we have a voracious fish of prey.

### Semi-darkened and Well-planted Tank

*Polycentropsis* likes a semi-darkened aquarium with a large quantity of aquatic plants in it. The surface should be covered with large-leaved water fern. This rather quiet fish, which will probably be somewhat shy at first and whose motions remind one of a drifting leaf, assumes an ambush-like position with only the incessant vibrations of the transparent fins and the restless scanning of the eyes betraying its true nature.

The species has no relatives anywhere in the world except in South America. On the opposite side of the torrid tropical coast of West Africa, across the Atlantic in the tropical waters of the Eastern coastline of South America, two species of fish are found which form the Family *Polycentridae*, together with the African species. While this small group had formerly been classified with the *Nandide* it was later considered by ichthyologists as a separate Family of the system; even laymen must regard this separate classification as justified upon closer scrutiny.

### Two Species from South America

One of the South American species is *Polycentrus schomburgkii* which abounds in the north-east and is very similar in external appearance to its African cousin. The other species is *Monocirrhus polyacanthus*, and constitutes in every respect the most deceiving adaptation to a drifting leaf, even the short stub of the stem protruding from the chin, a small fleshy protuberance, has not been forgotten.

The African Leaf Fish has been bred repeatedly in captivity. The eggs are deposited in every instance on



*Monocirrhus polyacanthus*, a South American Leaf Fish which, even more than its related African species, simulates a fallen leaf, due to the extension to its lower jaw.

August, 1953

By  
Dr. Werner Ladiges (Germany)

the underside of a floating leaf of an aquatic plant and usually hatch within two or three days with the assistance of the father fish. The hatching time depends on the prevailing temperature. The male parent keeps the small fry inside a pit and watches them until they have grown sufficiently to swim away on their own. The fry are extremely voracious, too, and immediately start out to attack small living freshwater crustaceans the size of which must be in proportion to the increasing size of the small Leaf Fish.

Full-grown Leaf Fish prefer small living fish and freshwater shrimps but they get accustomed to being fed on Earthworms and mosquito larvæ, some specimens even taking tiny particles of horse meat and beef. Temperatures should never drop below 22-23 deg. C. (72-73 deg. F.), and should be raised to at least 28 deg. C. (82 deg. F.) during mating time.

The African Leaf Fish becomes ever more interesting the longer one is able to observe its antics so it often attracts the interest of aquarists again and again. It must be regretted that supplies of this species have been rather irregular.

Another species should be mentioned which usually



*Polycentropsis abbreviata*, the African Leaf Fish. Although it lacks a lower jaw extension, its colour and shape give a leaf-like appearance.

head, somewhat above the level of the eyes. The spot possesses a high reflecting power and is typical of all fishes belonging to this Genus.

#### Egglaying Tooth-carp

The type shown in the illustration, which is rather attractive, is being imported in large numbers. It is *Epiplatys grahami* and was brought to Europe for the first time around 1912. It was regarded as an ideally-suited ornamental fish for aquaria because of its hardness but it went out of fashion later and other species were given preference.

The largest specimens of this *Epiplatys* barely reach a length of 6 cm. (2½ in.). The body is brown in colour, each individual scale bearing a red-brown spot. Sometimes the fish display a number of dark oblique transverse bands. If the right kind of lighting is used the fish emit a greenish metallic sheen.

#### Breeding Requirements

Breeding this species is easy; it spawns at temperatures around 26-28 deg. C. (79-82 deg. F.) near fine-leaved water plants or roots of floating plants close to the surface. Although the parents are voracious fish of prey, nevertheless some of the small fry manage to grow up with the bigger fishes if there is a sufficient number of water plants in which they can hide. The small fry do not require any special care worth mentioning.

(Whilst various authorities still prefer to classify *Monocirrhus polyacanthus*, *Polycentropsis abbreviata* and *Polycentrus schomburgkii* under the

Family *Nanidae*, it is interesting to note that G. F. Hervey and J. Hems classify these fish under the separate Family *Polycentridæ*, as recommended by our contributor. The author is known to aquarists all over the world through his authoritative writing on aquarium topics. Up till now these have been published mainly in the German aquarists' press. This article is the first of a number which he will contribute to WATER LIFE.—Ed.)



Photographs]

[Wilhelm Hoppe

*Epiplatys grahami*, an Egglaying Tooth-carp whose habitat is similar to that of *P. abbreviata*. *E. grahami* is a source of food for this Leaf Fish in its native haunts.

lives in the same waters as *Polycentropsis* and on which the latter feeds to a great extent due to their large numbers. It is a fish of the *Epiplatys* Genus which play a very important role in sustaining *Polycentropsis* and many other fish of prey. The bodies of *Epiplatys*, with the flattened edge on the back, are well adapted to their mode of life near the water's surface. This type of fish is particularly remarkable on account of a characteristic spot located on top of the

## F.B.A.S.—Quo Vadis ?

Is the Judges' and Standards Committee Representative of the Hobby and  
Is the Federation in Need of Re-orientation? — asks Capt. L. C. Betts

I WAS privileged to attend the second annual Judges' Conference called by the Federation of British Aquatic Societies in the spring of this year (reported on p. 165 of the June-July issue, WATER LIFE). This activity of the Federation is warmly welcomed in many quarters as, amongst other things, it meets a widespread demand, brings judges together both socially and academically and provides a ground for pooling and interpreting ideas. The secretary of the Judges' and Standards Committee, Mr. J. H. Gloyn, capably outlined the working of that committee, and gave an impression of great activity. The long agenda was carried through briskly and impartially by the chairman, Mr. P. S. Campkin. The agenda, paradoxically, was a mixture of rulings and invitations for opinions. It was not quite clear whether the judges present were intended to be executive or merely advisory. Certain it was that rulings were given on some subjects whilst other points of issue were merely discussed.

It must be apparent that the new constitution of the Federation is a distinct advance on the old in that the views of the organised hobbyist are aired better now than, say, three years ago. This should make for progress but is this, in fact, the case? Take the Furnished Aquaria classes, for example. Slowly, but surely, these classes are becoming waterlogged with rulings. There is a grave danger that the exhibitor will have very little freedom of choice. The regulations, intended to guide and define, will restrict the scope to such an extent that exhibits not conforming to the orthodox will have very little chance of appearing in the awards. This situation has arisen from a perfectly natural desire on the part of the exhibitor to be protected against unfair competition, sharp practice and poor judging.

### Judges' Pointing Sheets

A later contributing factor is a universal request for judges' pointing sheets which has led to a breaking down of the pointing to so fine a degree as to embarrass some judges and subject them to criticism not always justified. My own view on this is that any exhibit exceeding 50 points is entitled to the judges' pointing. Any exhibit below 50 points, in the main, has been slung together by the exhibitor, or prepared for inadequately, and a summary of the pointing would appear adequate. However, it is the general tightening up of the regulations that gives most cause for alarm. If many more rulings are made I can see a safety-first set-up being evolved which all exhibitors will follow.

The most disquieting feature from my angle, however, is the making of standards for fishes by the lay-hobbyist. As a lifelong hobbyist and a specialist breeder of all varieties of Goldfish for nearly 25 years, I do not take too kindly to, say, coldwater standards being made by tropical fishkeepers. Fanciers who visited my house in the 1920's will know I am not without knowledge of tropical fishbreeding but I have never claimed to be an authority on tropical fish.

Fish standards are not only set by the head but also by the heart and the Federation should listen only to those who have a deep understanding for the fish they are standardising. Indeed, I go further. The Federation should only be guided by those people who can produce fish of their own breeding approximately to the standards they are propounding. The hobby is maintained fundamentally by the stalwarts who breed the fish rather than those who find in aquaria a passing attraction.

I have met some hundreds who have come to me as novices for information, and stayed long enough to try to teach me

my job before passing from the scene. In some cases their influence has left a legacy of bad aquarium lore for, with democratic control of a hobby, it is numbers that count. A case in point concerns the fixing of numbers of fish constituting an entry in a breeders' class. The Standards' Committee, consisting almost entirely of tropical fish men, favour six fish to constitute an entry. The underlying motive of the breeders' class is "matching", matching for size, matching for colour pattern, etc. I think that six fish are too many and that four are sufficient. In the first place it is not possible to examine six small but active fish simultaneously and compare them against each other. The opportunity of seeing them all in profile together takes time, for usually they dart about and one can only see three or four sideways at a time and then they are spread all over the tank.

### Numbers of Fish Involved

I would view with suspicion any judge who said, after judging a class of 20 entries, that he had, in fact and with assuredness, looked at and examined every one of the 120 fish. What is more likely is that several fish would escape notice and many would be examined twice over. To assess a team of six young fish is a very trying and difficult operation in which a judge can easily make a wrong award without any serious come-back.

But I am more concerned with Goldfish and venture to suggest that there are not many breeders in this country who can put up a breeders' class entry of six fish, that is to say six perfectly-matched fish. Any novice knows that the colour patterns of the Nacreous (Calico) groups are extremely difficult to match and the only way to get a matching under these circumstances is to restrict the choice to say three colours, orange, black and white. It is the amount of each colour that varies so much, and presumably the area of each colour, not to mention the density of the pigment, which make it so difficult to match up. Goldfish breeders are trying to get as much colour into their strains as possible. It is too early yet to hope to get colour patterns running through a strain. In the case of the Metallic (Scaled) groups it is not so difficult since it is found that colour patterns and the amount of pigment are common to a strain of fish.

I would also like to point out that a Goldfish Breeders' class is subject to rulings that do not apply elsewhere. For example, each fish in the double-tailed varieties has to have a completely divided caudal fin and paired anals, which considerably reduces the exhibitor's choice of fish. Since the rate of growth and the development of the finnage varies so much in the double-tailed varieties, the odds of producing a matched team become bigger and bigger. The comments from some quarters that we do not want to make things easy certainly does not apply to breeders of Veiltails, Moors, Lionheads and Orandas.

### Goldfish Society's Ruling

The Goldfish Society of Great Britain has given this point much consideration and its ruling is that four fish constitute an entry for a current year's breeding class and two fish for one-year-old classes. Anyone who has taken the trouble to go through the society's handbook of standards will realise it has no intention of making things easy. On the contrary, the society is the only organised body within the hobby making standards with which are associated type tests to exclude from exhibition all runts and rubbish.

Thus the real future of the aquarium hobby lies in the

specialist society for them, of all people, feel strongly about the fish they keep and are deeply concerned about the shapes and colours they want their fish to have in 20 years time. They alone are prepared to give the time to the fish which interest them (as well as the time to their own specialist organisation) for the improving of their own particular fish. The Federation would not only be well advised to be guided by the specialist organisations that exist but to go further and encourage more of them to be formed.

There is a desperate need for a comprehensive set of aquarium fish standards and there is evidence which makes one believe that the general societies are becoming dissatisfied at the delay in publication. The issue last year of a second edition of the old standards did nothing to allay the impatience of the societies.

Apparently the Standards' Committee is tackling the job piecemeal, which means that somewhere around 200 separate standards will have to be evolved which, from my own experience, is a stupendous task. Readers will recall that I suggested the work could be quickly, effectively and satisfactorily attempted if a basic formula of pointing for all fish were evolved (p. 77, April, 1951 issue, WATER LIFE). Since I was chairman of the Standards' Committee at the time, and the Committee were not wholeheartedly in favour, I resigned from the post rather than see the position drag on interminably as it appears to be doing now. This idea of a basic formula of pointing has been tried out by the Goldfish Society for the last four years and, at the last committee meeting, its own formula was finally endorsed without alteration.

#### State of the Aquaria Hobby

The aquaria hobby, like most hobbies, is buffeted by petty jealousies, both individually and collectively, and whilst it can be said that it is not as bad as some hobbies it is not as free from its underground movements as it might be. Before the war the organised hobby was run by a coterie of enthusiasts, suggestive of the closed shop, although perhaps it was that I was too shy to join them. Be that as it may, the Federation must never be run by a clique, whether it be metropolitan or provincial. It must always be the servant of the hobby although not necessarily its slave. But in carrying out the wishes of the organised hobby it should ensure that it is its wishes which are being carried out.

At the moment a large well-established society can have

#### WATER LIFE BOUND VOLUMES

**B**OUND copies of WATER LIFE Volume 7, covering the period February-December 1952, are now available. An index to articles and contributors is included. There is gold lettering on the spine of the stiff, green, linen-finished cover. Volumes are available at £1 11s. 6d. per copy, post paid, from WATER LIFE, Dorset House, Stamford Street, London, S.E.1.

ten times the membership and pay four times the subscription and yet only have the same voting powers as a newly-formed society of 20 members. This was consciously legalised by the assembly out of fear of any steam-rolling tactics on the part of the larger societies and with this sentiment most people will have some sympathy. Nevertheless, the situation puts the scales heavily down against the larger societies whose business acumen has produced such flourishing bodies and where opinions are formulated from a large membership. In practice this system has worked out reasonably well, not because it is right in principle, but because those few societies that do trouble to send delegates along to the assemblies have nominated reasonable men and women.

This, of course, leads to a general criticism of the make-up of the Federation. All societies have to come to London to be represented. The Assembly is the final authority for all activities of the Federation. Because of this the Assembly takes on the responsibility, through its officers, to maintain an adequate panel of speakers and an adequate panel of approved judges. Thus, by dealing directly with the societies, it has obvious advantages, but by the very nature of the area to be covered, it cannot hope to cater adequately for the north and west areas of the country. It is like a huge inverted isosceles triangle resting on its apex with the apex taking too much weight. If the triangle is reversed the sides of equal length would be the societies, on top of which the area organisation would rest, with the Federation itself on top of the lot. In this set-up, area organisations would relieve the Federation of many of its headaches, not least of which would be the speakers' panel, leaving the Federation free to get on with such urgent questions as standards, etc., and matters of principle rather than detail.

There is no doubt the hobby and the Federation would benefit more from freely-developed area organisations than through the present direct approach. I expressed these views when I was chairman of the Federation and can see no reason to change my mind now three years have elapsed.

#### — Know Your Fishes —

### No. 28. *Pæcilia vivipara*



Photograph

[G. J. M. Timmerman]

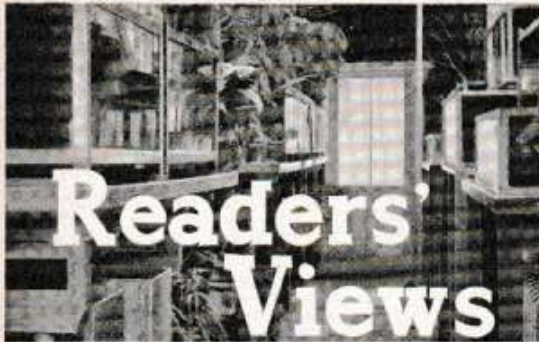
Like *Platypæcilus variatus*, not all specimens of the livebearing *Pæcilia vivipara* show their colouring to the full. With *P. vivipara* all the brilliant colour is centred in the dorsal fin of the male. Ideally, but all too infrequently, this fin is an orange-yellow with two black bands, one near to the body and the other at the edge, the latter is not shown in the photograph (male on the left). Some male fish have a rich yellow in the region of the throat. The body is an olive brown above and silver below but, there is frequently a bluish tinge

to the silver, particularly in the males. Both sexes have a black spot, gold-edged, on the side in front of the dorsal fin. There is another black marking, which might be mistaken for a gravid spot lower down the body. This is more conspicuous in the female. All fins except the dorsal in the male, and all the fins of the female, are clear or faintly yellow. The markings on body and fins may vary somewhat.

As with most livebearers the male is much smaller, reaching a length of 1½ in., whilst the female grows to 3 in. *P. vivipara* is lively but quite peaceful. Colourful males look well in a mixed collection.

The species often produces large broods, over a hundred not being unusual, and their breeding is not difficult to induce. Care of the young is similar to that given to other livebearers. Fine livefood such as screened *Daphnia* and Brine Shrimp should be offered and plenty of soft, Green algæ made available. In the absence of the latter, finely chopped lettuce or chopped boiled spinach make good substitutes. When anywhere near maturity the male can be recognised by the modification of its anal fin to form a rod-shaped gonopodium.

Temperature range is 68-80 deg. F., and habitat is the northern part of South America, including the Leeward Islands. Class Pisces. Order: Microcyprini. Family: Pæciliidæ. Genus: *Pæcilia*. Species: *P. vivipara*.



The Editor is not responsible for opinions expressed by correspondents

### F.B.A.S. JUDGES' CONFERENCE

SIR,—Your report on the second Judges' Conference organised by the Federation of British Aquatic Societies referred to a motion in my name that was approved. It was that the same judge should be allowed to adjudicate in both coldwater and tropical furnished aquaria classes at a show.

The motion was put forward after my attention had been drawn to the fact that the Judges' and Standards Committee of the F.B.A.S. only approve a given judge for either coldwater or tropical furnished aquaria classes. It appeared illogical to me to split the hobby into two watertight compartments.

There is, as we all know, a shortage of judges and the insistence on the segregation worsens the situation. Several competitors in the furnished aquaria section have been very successful in open coldwater and tropical classes and such people are competent, in my opinion, to judge both.

The only opposition to the proposal came from the representative of the Goldfish Society of Great Britain who championed the specialisation angle. This is probably necessary in regard to breeding coldwater species but it does not follow that such restrictions should apply to furnished aquarium judging. During the discussion, it transpired that although the Federation does not recognise that judges can officiate in both coldwater and tropical furnished aquaria classes, individual judges on their panel had taken the law into their own hands, as the result of pressure from show secretaries, and were in fact undertaking engagements which included judging all the furnished aquaria entered.

My motion which would regularise an existing state of affairs is, of course, only a recommendation to the Judges' and Standards Committee. It remains to be seen whether the Committee accepts the proposal which was carried.

Another contributor to the discussion on furnished aquaria was Mr. R. E. Legge of the F.N.A.S. He publicised the fact that there does exist in the minds of competitors a considerable degree of confusion over what a judge expects to see in exhibits in these classes. I suggest that the trouble is caused by two or more judging the classes jointly. The result can at best be nothing more than a compromise which is unsatisfactory to the exhibitor.

I believe the day will soon come when open furnished aquaria classes will be judged by a single judge who will stand or fall by his own decisions.

Beeston, Notts.

W. C. WEBLEY,  
Show Secretary,  
Nottingham A.S.

(Notes prefacing the July, 1953, list of approved F.B.A.S. Judges state that in coldwater and tropical furnished aquaria classes . . . Judges may be interchanged between the two classes.—Ed.)

### COLORATION OF STICKLEBACKS

SIR,—Mr. W. Roughsedge contributed an interesting letter on the behaviour of Sticklebacks in your December 1952 issue. I have a 24 x 12 x 12 in. tank. The occupants are one male and three female Sticklebacks (*Gasterosteus aculeatus*). The male was a picture at the end of April.

I have kept Sticklebacks in the same tank as Goldfish and they have agreed very well. No fighting took place. When I fed White Worms to the fish, the Sticklebacks were in the forefront. The spines were erect and the two spikes on the underside were at right angles to the body, but they were never used.

I have read in books that it is dangerous to keep Goldfish and Sticklebacks together. I think this is nonsense as I have

kept these fish in the same tank for some time now, just as Mr. Roughsedge has done. I also, am of the opinion that most aquarists look on a Stickleback as a kiddies' fish. If they are placed in a tank of reasonable size they can be very interesting, darting here and there, never still a second. Where a male is in full colour it puts some tropical fish in the shade.

A fish in my tank, along with the Sticklebacks, is not the same colour as the others. He is as black as a piece of coal. At times he changes for about five minutes or so, when his body becomes a dirty brown. There is very little colouring in the eye. He chases his pals and grabs them by the tail, but never uses his spikes.

He started to build a nest with particles of plants and after some time was seen to pick up in his mouth pieces of grit and drop them on his nest. The grit proved too heavy for the plants on which the nest was being built; they bent right down to the floor of the tank.

He left this nest a week or so in this position and then gave it up as a bad job. He selected the stick-on worm feeder as a new site for his nest. He tried building this new nest for three weeks. The tray of the feeder was full of grit and weed. If he did not place a piece of grit in the right position and it dropped to the floor of the tank, he darted after it, grabbed it and back into the feeder it went.

Can any reader give me the name of this fish? I have been out walking and have seen a boy with a fish similar to mine. He told me it was a Black Jack. What is it? It is similar to a Ten-spined Stickleback, but black.

G. K. KINNAIRD

(The name Black Jack is, apparently, an appropriate local appellation for the male Ten-spined Stickleback (*Pygosteus pungitius*) in full breeding condition. Whereas the Three-spined assumes a range of crimson, golden and green coloration in the breeding season, the Ten-spined becomes a velvety-black. Some specimens, when building their nest, weight it down with pieces of gravel.—Ed.)

### CHARACTERISTICS OF HORNWORT

SIR,—I note that in the June, 1953, issue of WATER LIFE, Hornwort (*Ceratophyllum demersum*) is described as a submerged aquatic. This plant is a floating subject, making branching growths on the surface in the summer months. When specimens of this plant get caught on the bottom, either by branches or by ends becoming covered with soil, they lose the characteristic close-spacing of leaves and lengthening of the stem occurs due to their endeavour to reach the surface. If we include this species as a true submerged aquatic we must also include the Ivy-leaved Duckweed (*Lemna trisulca*) as this again remains submerged just under the surface. With the approach of autumn, both species sink deeper as a protection from frost. In the case of *Ceratophyllum* the crowns tighten up in winter and become quite hard to the touch and it is probable that, like *Lemna*, they allow more water into the foliage, thereby becoming waterlogged. They sink to the bottom, to reappear at the surface next Spring.

This plant is a mystery as, when its seeds are examined, embryo roots are found inside. On germination, these roots develop to  $\frac{1}{2}$  in. long but grow no further. With seedlings that I raised such root growth as there was gradually turned brown and disappeared. It is probable that at one time the plant did root in the mud but, over a passage of time, it has adapted itself to its present form.

W. C. CLEVELAND, F.R.H.S.

(The reference on page 138 of our last issue explained the limitations of the subject and observation was made that "the plant grows quite well for a time when free-floating but rooting in the planting medium should be encouraged". It would be incorrect to say that Hornwort develops roots or that it is a surface plant. Free from the bottom, it remains submerged just below the surface and its flowers are fertilised while submerged. When planted in the mud it anchors itself.

Mr. Cleveland has forwarded extracts from Ward and Whipple's work "Fresh Water Biology" confirming that root development is suppressed, that the rudimentary root does not develop into an organ of attachment and that, so far as is known, adventitious roots never appear. Mrs. Frances Perry, F.L.S., was asked to comment on the view that Hornwort is accurately described as a floating plant. Mrs. Perry writes:—Hornwort represents one of the plant puzzles amongst aquatics. It is true that it produces no roots in the true sense of the word, but it is also equally untrue to call it a floating plant. It has been known as "the Vegetable Vagabond" because of its wanderings between the various levels of the water strata. Instances have been observed of the plant flourishing at tremendous depths. In a true floating plant we expect a good deal of the plant to show above the surface, for at any rate part of its life history. Usually this is about flowering time, as with the Water Soldier and *Lemna trisulca*, which only rise in order that the blooms may be fertilised above the surface. Hornwort lives entirely submerged throughout its entire life, even the flowers being pollinated under water. The production of buds or turons is not unusual with submerged plants or flowers, e.g., Water Frogbit.—Ed.)

## POND SIDE LABURNUM TREES

SIR,—I note that the "Notes for Novices" article in your April 1953 issue, which deals with designing and building garden ponds, includes the statement that Laburnum leaves are toxic to fish life.

In 1935, I built a pond in the garden of the house where I was then living. It was the same size as that recommended in the article, namely 6×4×2 ft. deep. The pond was overhung by a large laburnum tree. In the course of a year it must have had a large number of leaves, flowers and seed pods fall on to its surface but I can truthfully say that, to the best of my knowledge, I never lost a fish during the four years that I remained at the house.

I did not keep fish in aquariums in those days. The pond was more of a garden ornament than a home for fish as I was completely ignorant of the do's and don'ts of fishkeeping. Maybe it was pure luck, but on looking back I rather feel that a large part of my success lay in the fact that I let well alone.

It would be interesting to hear if any other readers have had a similar experience with a Laburnum tree so near their pond. Bexhill.

D. JOLLIFFE

(We, like the author, thought Laburnum leaves sinking to the bottom of a pond and decaying would have been harmful, but in view of Mr. Jolliffe's letter we sought advice on the matter. Our Water Analyst, when consulted, replied, "It is well known that Laburnum seeds are toxic if eaten by humans and cattle; they do not, however, appear to have any deleterious effect upon rabbits or hares. The poisonous principle of Laburnum seeds would not be soluble to any great extent in water, and in all probability the poisonous substance of the seeds would break down and become non-toxic during decomposition. Therefore these seeds might only prove to be toxic to fish life if the fishes ate them whilst still in a fresh condition, but bearing in mind their relatively large size they would no doubt be rejected by the average pond fish." His report suggests that we can retract the warning about *Laburnum vulgare* or *L. alpinum*, but this does not preclude readers who have first-hand knowledge of the effect of these seeds in their garden ponds from sending us an account of their experience.—Ed.)

## ELUSIVE TROPICALS

SIR,—Two questions that have puzzled me are how, and where, the species listed in the books on tropical aquarium fishes are caught. Such books mention an appreciable number of attractive aquarium fishes as, for instance, *Hypheosobrycon flammeus*, and others. I have never succeeded in catching them with the rather large, fine-mesh nets that I have been using in a number of streams, large and small, in the vicinity of this city, as well as up to a distance of nearly 100 miles from here.

I succeeded in catching several specimens of what seem to me to be *Cichlasoma facetum*, which fish, by the way, I found far too pugnacious to keep in my 6 ft. long community tank, and transferred to my garden pond where they do no harm to the smaller fish thriving there. I also caught numerous Catfishes including some fine specimens of *Pimelodella gracilis*; some small unlisted specimens apparently belonging to the Genus *Corydoras*; some specimens of what seems to be *Otocinclus affinis* and *Plecostomus plecostomus*, as well as other, unlisted, types of small Sucking Catfish. Further, I have taken a great number of a fish that looks like *Hemigrammus ocellifer*, although I am not certain as to whether they can be identified as such.

I have never found in my nets any of the various species described as beautifully colourful. Strangely enough, none of the tanks in the aquarium of this city's Zoo, contains anything more colourful than the rather plain species I mentioned above, apart, maybe, from a collection of *Geophagus brasiliensis*.

Any practical knowledge or experience in the field of catching tropical fish your readers could supply me with, would be most welcome.

Rio de Janeiro,  
Brazil.

ROBERT DE ROOY

(For the next four months Mr. de Rooy will be in Europe. Letters should be sent to him c/o Sternes, Maralteen 29, Strand Str., Baerum, Oslo, Norway.—Ed.)

## SOME WORM SUM

SIR,—This is to enlighten the beginner, and would-be aquarist, on what to expect if they insist on feeding garden worms to fish. I feed my fish four days a week on this very staple and body building food.

During a short period of relaxation I discovered the following facts. For an adult coldwater fish I find that one 4 in. worm will provide a day's diet. I never have less than twelve such fish throughout the year. In addition, of course, there are, periodically, numerous fry and young fish to feed.

I cut the worms with a one-sided razor blade. Each time a cut is made, the blade travels 1 in. forward and 1 in. backward. The worms are cut on a small block of wood. One 4 in. worm

requires 240 cuts. At one inch each way, the blade travels 480 in. or 40 ft. This small operation takes approximately 3 minutes. To find twelve such worms in my garden requires 20 minutes digging.

Reduced to comparative figures, one day's quota of 12 worms involves 48 in. of worm, 2,880 cuts equalling 480 ft., 36 mins. cutting, plus 20 mins. digging. Four days per week accounts for 48 worms, involving 16 ft. of worm, blade movements equalling 1,920 ft., 144 mins. cutting, plus 80 mins. digging. One year, at four days per week, calls for 2,496 worms, or 832 ft. of worm. The razor blade travels 33,280 yards (18 miles, 7 furlongs, 60 yards), cutting takes 7,488 mins. (5 days, 4 hours, 48 mins.), digging 4,160 mins. (2 days, 21 hours, 20 mins.). The combined times for cutting and digging add up to 8 days, 2 hours, 8 mins. per annum. And I've been doing this for twenty years. Hall Green,  
Birmingham, 28.

T. L. DODGE

(It is suggested that our correspondent might dodge so laborious a task with *Lumbricide* by investing in a worm shredder.—Ed.)

## LINK WITH THE SPANISH ARMADA?

SIR,—The accompanying illustration shows four little Mother-of-Pearl shells, each containing a large solid pearl. Each is smaller than a shilling piece and their gross weight approximately one third of an ounce. Their small size and shape make them outstanding rarities. These gems were hidden for more than 300 years by an Irish family, the O'Donnell's, who lived on the island of Arranmore.

Shortly after the Spanish Armada had been defeated, the pearls were given to Hugh Roe O'Donnell. His warlike character had caused him to clash with the English. He fled from Ireland to Spain where favours were conferred on him. A Grandee was in possession of these pearls at the time of the Armada (1588) and either he or King Philip II is said to have given them to O'Donnell for services rendered. The four pearls were handed down to descendants and Mary O'Donnell (Mrs. Ernest A. Chapman) received them from her father sixty years ago. Their origin is a mystery. They may have been appropriated by some Spanish adventurer to the Far East centuries ago.



The four pearl shells in Mr. Chapman's possession. It is fascinating to think of the possibility that these small Mother-of-Pearl shells were once admired and handled by a King of Spain. It will be of very great interest to those who study molluscs if more light can be thrown on their earlier history.

Among the few privileged people to have seen the shells have been Dr. A. Morley Davies, A.R.C.S., D.Sc., F.G.S., F.R.G.S., formerly Professor of Palaeontology, London, the late Mr. B. B. Woodward, F.L.S., Dr. H. E. Balch, M.A., F.S.A., the late Dr. W. E. Collinge, F.S.A., Dr. W. T. Elliott, F.L.S., F.Z.S., and Dr. L. R. Cox, M.A., Sc.D., of the British Museum.

The pearls appear to be identical with fossil specimens from the Miocene period. They are not fossils. They are not thought by many scientists, including the late Professor Wm. H. Dall, who was palaeontologist of the United States Geological Survey, to be derived from a species of *Meleagrina (Pinctada)* but from *Pteria (Avicula)*, like the pearl-bearing shell of the Cingalese fisheries. One report states that they are quite unlike any other bivalve and though allied to the Pearl Oyster, belong to a different species or Genus, possibly *M. phalacrocea*, hitherto thought to be extinct. Another contains the observation that the biggest mystery about them appears to be that so large a pearl could developed on such a small bivalve.

A short while ago, I received a letter from Dr. Waldo L. Schmitt, Head Curator, Department of Zoology, United States National Museum, Smithsonian Institution, Washington, D.C., stating that both he and Dr. Harold A. Rehder, Curator of the Division of Molluscs, are very interested in the pearls, and their history and hope some members of the staff of the Museum have an opportunity to visit London and examine them.

I wonder if any of your readers know of any published records that might throw some light on the shells?  
London, S.W.12.

ERNEST A. CHAPMAN



## PROBLEMS ANSWERED

Queries are answered free of charge by a panel of experts. They should be sent to "Water Life," Dorset House, Stamford Street, London, S.E.1, together with a stamped, addressed envelope for the reply. All queries are answered direct but a small selection is published below.

### Fish in a Small Tank

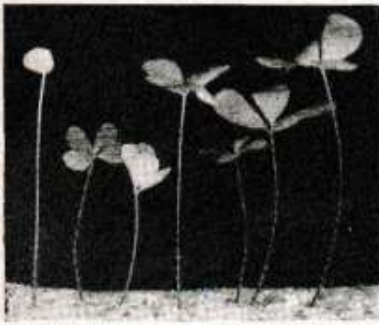
In my 8x8x16 in. aquarium, which receives aeration, there are two 2½ in. Goldfish and a 1 in. Peacock-eyed Bass. Do you think it would accommodate a 3 in. Perch, a 2 in. Roach or another 1 in. Bass as well? Which is the most suitable food for Goldfish?—(H.S., Edinburgh, 3).

Peacock-eyed Bass are livefood eaters and therefore do not make suitable companions for Goldfish. The same can be said for Perch. Roach are river fish and do not take to aquarium life anyway. Your aquarium holds four gallons of water, which means you can keep the two 2½ in. Goldfish or the 3 in. Perch or the two Bass. Suitable livefoods are live *Daphnia*, garden worms, etc. Chopped garden worms are certainly the best food for Goldfish if you can get them.

### Goldfish Changing Colour

I have a garden pool in which there are some Goldfish and I noticed recently that some youngsters 2½ in. long were nearly black. I believe that this is the natural colour for young fish and in due course they change to gold-red. At what age do they normally change?—(S.S.G., Abington, Nr. Wolverhampton).

As you surmise, young Goldfish are of a dark olive colour until they turn orange and red. The ability to change colour is inherited and the time taken for the change varies from fish to fish. Some specimens never change whilst others will turn from four months old onwards. In this country the weather seems to have a lot to do with it. Usually, a long warm summer will



Photograph] [G. J. M. Timmerman  
The four-lobed Underwater Clover (*Marsilea quadrifolia*), useful for aquarium decoration.

produce a high percentage of coloured fish. If your fish are turning black, you can expect the orange or red colour to appear shortly. Black coloration often immediately precedes the change to red.

### Tortoise Eggs

Could you give me some information on breeding tortoises? I have two of these creatures and, at the beginning of May, I dug up some eggs which had presumably been laid last year. I would like to know

One of our attractive native species, the Perch (*Perca fluviatilis*). It is a carnivore and not really advised for a mixed collection. Photograph]

[L. E. Day



the time of year that eggs are laid, at what temperature they need to be kept and, if possible, a method of telling whether they are fertile.—(P.G.Y., Ipswich, Suffolk).

Tortoises lay eggs at almost any time during the summer and they may prove fertile. There is no way of checking fertility, so far as we know. If mating has been observed some weeks before there is a strong possibility. Also, eggs laid by tortoises shortly after they have reached this country are usually fertile. When the eggs are discovered prepare a box (wood or tin) containing loose earth or sand. Pick up the eggs and place them in the box in exactly the same position that they are found (do not turn them). Cover with about 1-2 in. of sand, place a glass over the box, and store in a warm place (about 80 deg. F.) such as an airing cupboard. Incubation period is from two to three months.

### Plants for the Tropical Tank

Could you help me by suggesting plants which would be suitable for a 36x12x12 in. tropical aquarium?—(L.M., Plymouth).

*Sagittaria lorata*, *S. natans*, *S. subulata*, *Giant Sagittaria*, *Echinodorus tenellus* (*S. microfolia*) or any of the *Vallisneria* species and varieties will form a good basis around which the plant life of the tank can be developed. *Sagittaria* and *Vallisneria* do not do well in the same tank. Ultimately one will survive at the expense of the other. Canadian Pondweed (*Elodea canadensis*) is also very good. The *Cabomba* and *Myriophyllum* species are also quite attractive but are not always so easy to grow. For contrast and decorative effect, the *Cryptocorynes* are very fine but rather expensive. Other interesting plants that can usually be obtained are *Ceratopteris pteridoides* (Floating Fern), *C. thalictroides* (Indian Fern), *Echinodorus intermedius* (Amazon Sword Plant) and *Marsilea* species (Underwater Clover). There are, of course, others but from the above you should be able to set up a very fine-looking tank.

### Producing Black Swordtails

Can you tell me what cross is necessary to produce the Black Swordtail as recognised by the F.B.A.S.?—(B.M., Wembley, Middx.).

We do not think you will produce a Black Swordtail to F.B.A.S. standards by the method you suggest. Line breeding would be useful if you could get stock from a black or semi-black strain. It is possible that

they might be produced from Wiesbaden (Green or Red) or London types since fish of these two strains show a lot of black. The standard calls for the entire fish, including the fins, to be an even shiny black. The outline and fins should, of course, comply with the main standard. Very few good Black Swordtails have ever been seen. Those that have been exhibited usually show far too much blue and white. They have very poor swords, usually much too small and often badly shaped. It is thought in some quarters that it is impossible to breed a good black specimen since it is believed that when attempting to get good colour and shape the result is lethal. You are trying to produce one of the most difficult fish. Many have tried and failed but we hope we are not discouraging you too much.

## WATER ANALYSIS

Samples for analysis should be sent in a clean pint bottle to Water Life Analyst, 12, Featherbed Lane, Addington, Surrey, together with a fee of 5s. per sample. The name and address of the sender and details of prevailing conditions should accompany each sample which is submitted.

Sample received from C.W.H., Bristol S. Taken from a wooden tank in which rainwater draining off a garage roof was collected. It had been filtered through sand. The water was required for filling a 48x15x15 in. tropical aquarium.

Test for impurities:— Appearance: turbid, green algal growth present. Odour: slightly earthy. Total dissolved mineral content: 0.0222 per cent, excessive content for rainwater. Organic matter: 0.0056 per cent. Nitrogen compounds: 0.000096 per cent, excessive pollution indicated. Ammonium compounds: 0.000032 per cent, excessive pollution indicated. Poisonous metals: none detected. pH: 7.3. Chlorine, as salt: 0.0016 per cent.

Suggested corrections:—The results obtained from the chemical analysis of this sample of rainwater reveal that it is grossly contaminated with organic matter, probably of animal origin, i.e., faecal matter. The excessive hardness present (160 parts per million), calculated as calcium carbonate, is reflected in the very high dissolved mineral content in the sample. This water does not bear any resemblance in character to rainwater. It is suggested that the wooden tank be thoroughly examined for animal remains. The water in its present condition is useless for the breeding of any kind of fish.

# In and Around the Aquaria World

— By W. J. Page —

AN interesting and welcome visitor from South Africa, now back in Johannesburg, was Mrs. N. G. Rose who called at this office a few days before the Coronation. The wife of the manager of the African Pet Co. (Pty.) Ltd., she is herself a keen amateur aquarist and has bred both Neons and Glowlights. For the former, 18 x 12 x 10 in. tanks are filled with water but there are no plants or compost. A piece of slate is put in, raised from the bottom by one or two glass marbles, and the young Neons are seen hanging from the underside of the slate before they become free-swimming.

Mrs. Rose has had different experiences from contributors to our columns who have written on their Glowlight breeding results. One thing she pointed out was that after seeing the fry for two or three days after birth she is accustomed to their apparent disappearance from then onwards for a number of days. What apparently happens is that they cling to leaves of plants and being absolutely transparent, at least to the naked eye, they remain unseen until they develop. Mrs. Rose wonders how many aquarists have, unknowingly, succeeded in getting their Glowlights to spawn but not seeing the minute young have, in their impatience or ignorance, stripped down their breeding tank and poured away not only the water but with it the living babies that might have grown up into a healthy family of *Hypessobrycon gracilis*?

MR. DAVID BALDRY, F.Z.S. of Accrington has expressed to me by letter his views on the use of diplomas as prizes at shows. He considers that they should only be awarded discriminately. For instance, he thinks that they ought to be confined to the best fish in show or the best furnished aquarium and not be offered to second prizewinners. There is the exception to every rule: at WATER LIFE's displays at Olympia, they are given as second awards to the show organiser's "Awards of Merit". Where, however, they are offered as special prizes to societies promoting shows, it is expected that they will be given, as far as possible, as premier awards. While I think the decision can be left to the show committees concerned, I would say that generally speaking they do allocate them in the way Mr. Baldry favours.

WHEN aquaria clubs organise day outings, they often like to combine a motor coach ride through the countryside with a visit to a breeders' establishment, a professional aquarist or a public aquarium. That they stop *en route* for refreshments, enjoy a sing-song on the road and, generally, make the day a happy social occasion with wives and friends present, can be incidental in the eyes of the more serious members. These take not only a sandwich lunch but also a jar or jars in a carrying case, hoping to purchase some new stock at their port of call.

I can well imagine the disappointment of one club who organised an outing to an establishment some considerable distance away from their home town only to find

on arrival practically no stock on view. As I have said in a letter of commiseration, they could to advantage enquire from societies in the locality of the establishment if the visit is likely to be a worth-while one. To be fair to the majority of our traders, they will not give invitations to clubs unless they can justify visits being paid, but of course in some cases, where they rely on periodical imports for their stock, the extent of the show they put up can vary from time to time.

A LENGTHY experience as an amateur aquarist before becoming a member of the trade adds weight to the views of Mr. A. H. Boughton whose paper, read to the Aquatic Traders' Association (page 224), was couched in forthright terms. It is as well to know that the trade, in an attempt to improve itself, has someone of Mr. Boughton's calibre to lead discussions, recognising the fact that co-operation between the amateur aquarist

wants in the dealers from whom he buys his fish, fishfoods, apparatus and equipment.

THE British Aquarists' Festival seems to have resolved itself primarily into an interclub show between societies affiliated to the Federation of Northern Aquarist Societies. Nevertheless, at the 1953 event, reported in the last issue, there was competition of high quality, if not the expected quantity, in the open classes from clubs and members of clubs from outside the area.

Hendon A.S., in the south, and Nottingham A.S., Wolverhampton A.S., and Worcester A.S. from the Midlands, were represented. Hendon A.S. members did extremely well, overcoming the difficulties presented by the long journey.

The results show up the fact that points given by different judges do not necessarily provide a true comparison of the merits of exhibits. For example, the Marbled

## Student Teachers Collecting Specimens from an Epsom Pond.



As part of their training, four students at the L.C.C. Teachers' College, Avery Hill, collect specimens of pond-life from the Stew Ponds at Epsom in Surrey. Above: Yvonne Hurst (Surrey) and Maria Spencer (Yorkshire). Right: Madge Oglesby and Kathleen Betts (Norfolk). They were attending a field course at Juniper Hall, Dorking.

and the professional is necessary.

Mr. Boughton, whose association with the hobby goes back a number of years, was a founder member of the Fish Culturists' Circle, one time secretary of the British Aquarists' Association and a keen supporter of the now defunct Aquarium Trade Guild. Pre-war, after Mr. Boughton commenced trading as the Artistic Aquaria Co., he acted as agent for Bartmann fish foods which came from Germany. Now Mr. Georg Bartmann is an agent for the products of Singleton Bros. (Instruments) Ltd., of which firm Mr. Boughton is a director and that firm holds Mr. Bartmann's agency.

It can be said that Mr. Boughton does not agree with all that the A.T.A. does. Nevertheless, he is keen to get that organisation to draw up some generally accepted policy not only to protect the professional but to raise the standard of trading. Any such agreement should benefit the amateur fishkeeper and give him the confidence he

Cichlid, shown by Mr. D. B. Cannon of Hendon A.S., was awarded 87½ points, and the Fantail selected as the best cold-water fish, shown by Mr. W. C. Webley of Nottingham A.S. gained 91 points in its class, yet the former was winner of the trophy for the best fish in the show.

Presumably, when the judges conferred to decide the winner of the Kemsley Trophy, they agreed that the Marbled Cichlid deserved pride of place although not earning so many points. Here is a case where, under the F.B.A.S. star scheme, a silver star fish would have taken precedence over one entitled on points to a gold star; all of which could be very confusing.

MR. L. G. LUCAS, secretary of Lancaster and Morecambe A.S., sends me a legitimate grouse. His society secured the services, as lecturer, of a well-known aquarist from the South who agreed to make the journey to talk on Goldfish

breeding. The attendance was much smaller than anticipated, and Mr. Lucas reports with regret that out of 14 societies invited to be Lancaster and Morecambe's guests for the evening, only 4 had the courtesy to reply. The society is a relatively young one and has been newly-enrolled in the Federation of Northern Aquarium Societies. It is wondering whether the poor response was due to apathy or the failure to hear from the societies concerned was caused by thoughtlessness. Knowing the difficulties these days of getting enough lecturers to fill a year's programme, I can sympathise with Mr. Lucas and his colleagues. Certainly the experience they have had does not create the impression in their minds that societies are at all times ready to get together and foster good feelings.

**DORSET HOUSE**, where **WATER LIFE** has its offices, overlooks the London Nautical School. There, boys aged 12 to 17 years, undergo comprehensive training prior to entry into the Merchant Navy. I welcomed the opportunity to visit the school recently to get some first-hand information about an adventure which thirty-three of the young students are to undertake this month.

Travelling by coach, complete with all the equipment necessary for camping on the way, they cross the Channel and journey through France to the Mediterranean, when, with frogmen's "flappers", goggles (including some constructed from discarded gas masks) and harpoons made at the school, they hope to emulate Hans Hass to whom I referred in the last issue. The underwater study of fish life will be a practical way of amplifying the information they have gained in their school lessons on biology and zoology.

My visit was at a time when tents were being examined, other camping apparatus checked, food supplies assembled and the hundred and one other things that such a journey entails being attended to, largely by the boys themselves. It coincided with a similar activity on my own part, that of helping to organise a camp for a youth organisation, so I could readily appreciate the amount of work involved. Mr. Norman Fortune-Flower, who will be in charge of the party, has promised to let me have an account of the combined holiday and submarine "field work". It should make an interesting story for a future issue.

**THIS** year's N.A.S. exhibition, reported on page 220, has come in for some criticism but, before blaming the organisers, it is as well to consider the drawbacks and to examine their causes.

First, the attendance was down but that was not the fault of the society; it was their misfortune. They kept to their usual dates but, although London was crowded more than usual, the counter-attractions of Coronation sightseeing affected the gate.

Secondly, support by the trade was less than in previous years. This was again unfortunate since it reduced the income from stand rents. Was support lacking because the trade was experiencing the after-effects of a recession such as is inferred on page 224 by the A.T.A.? Certainly it was not through any dislike of the National.

Thirdly, visitors to the show complained that the quality of the exhibits was poor in some classes compared with former shows

run by the society. Coupled with that is the dissatisfaction expressed by a proportion of those would-be exhibitors whose entries were returned. Neither of these criticisms reflect on the promoters. The moral seems to be that next year those who claim to have better fish should enter early and so make sure of being accepted. The number of tanks hired for aquaria shows has to be decided well before the date it opens and it is impracticable to attempt to accommodate a rush of last-minute entries that exceeds the pre-arranged number of tanks.

From what I saw of it, the show was as well organised as ever by the N.A.S. Council, show committee and competition secretary. I believe I am voicing the opinion of others when I say that if, should the show make a loss instead of a profit, there is any suggestion of not staging another National next year, the hobby would be the loser and such a decision would be a hard one for the workers of the N.A.S. who deserve a better return for their wholly voluntary endeavours.

The opening ceremony was performed by Mr. George Cansdale, Television's Zoo Man. Much interest was shown in the non-competitive display staged by the London Group of the British Herpetological Society.

**A FRUITFUL** evening spent in company with members of the Croydon Tropical Breeders' Circle was the fulfilment of a long overdue intention on my part. It has been my pleasure to know individual members but this was the first time I had met them in force.

The Circle embodies all the virtues of club life and, so far as I can see, few of the drawbacks. The regular host is Mr. Peter Hewitt and, as is usual, we first gathered for an informal chat in his fishhouse where so much successful breeding has taken place. Afterwards we repaired to his house for a meeting marked by its friendly atmosphere, ready interchange of views and plain, down-to-earth debate in which constructive criticism of things done will help everyone to do better in their own fishroom.

Most, if not all, of the members, belong to other clubs and the deliberations within the Circle must help them to contribute useful information at their local society's gatherings. They have an excellent arrangement whereby fish can be readily interchanged and the knowledge gained from experiments are carefully recorded for future reference.

Mr. J. Searle of Balham was down to give a talk on methods of heating tropical aquaria. To say that he did not get beyond

the opening notes of his intended survey is no reflection on him. What it means is that he gave us sufficient to discuss for the whole evening and, as had happened on previous occasions, I had reluctantly to leave with no time to spare before my last train went.

The merits of electricity, gas and oil heating were examined. It was found that from experiments carried out gas heating is practicable and not too expensive, that Color Gas units can be adapted economically, and that electrical heating is cleanest and easiest to use though more expensive. Perhaps the most important information was that the danger of fumes from paraffin oil can be minimised these days and modified oil pressure lamps are successfully being tried out. I hope to get more details later.

**MR. HEWITT**, like other members of the C.T.B.C., is a keen supporter of the Association of South London Aquarist Societies. A self-governing entity, A.S.L.A.S. has held its own judges' courses for tropical enthusiasts and is now hoping to get support for one for potential judges of coldwater fish, of which Mr. R.H.I. Read, the well-known Goldfish breeder, will be in charge. I must explain that A.S.L.A.S. provides its own judges for shows held by affiliated societies and I would suggest that the Federation of British Aquatic Societies which, at one time, I believe, were a little apprehensive about the influence of A.S.L.A.S., are now thankful for its existence, if only for the relief it gives to the demand on the F.B.A.S. for judges and lecturers. A.S.L.A.S. has started to issue a newsletter to members. The annual show (July 29-August 1) was judged by A.S.L.A.S. and F.G.B.S. judges, using F.B.A.S. and F.G.B.S. standards.

**A FORMER** member of its Council has, I believe, been largely responsible for getting the Federation of British Aquatic Societies to negotiate with a well-known insurance company. If the plans come to fruition, I think it will be possible shortly, for members of affiliated societies to take out policies against the loss of fishes, apparatus and fittings in return for a comparatively small annual premium. There is to be a standard policy for the aquarist with the average number of tanks and special quotations are to be given for larger collections.

The scheme should be of interest to most whose aquaria, their contents and all that goes with them, can represent an appreciable amount of money. The F.B.A.S. and the Company are to be commended on the progress they have made so far.

#### FOR YOUR BOOKSHELF

##### Royal Gardeners\*

**I**n the Coronation Number we noted the excellence of Lanning Roper's account of the Royal Gardens. Now comes to hand another book with a somewhat similar title but which deals more with the great personal interest in gardening taken by His Late Majesty King George VI and the Queen Mother. The author, who has written numerous books on gardening and is the Principal of the Horticultural Training Centre at Thaxted, was given full opportunity to study the Royal Gardens and was permitted to discuss them at length both

with the Queen Mother and the late King. He records, too, that Their Majesties completed questionnaires in their own handwriting. The book is primarily for the garden-lover but fishkeepers will find some of the pictures, like those in Mr. Roper's book, full of interest, for they show prominently pools and lakes at the Royal residences. Mr. Shewell-Cooper refers to the gardens at Buckingham Palace, Balmoral Castle, Windsor Castle, Royal Lodge, Windsor and Sandringham House.

"Royal Gardeners", by W. E. Shewell-Cooper, M.B.E., N.D.H., F.L.S., F.R.S.A., 66 pp. text plus 5 pp. of colour plates and 48 pp. of black and white photographs. Published by Cassell & Co. Ltd. Price 6/-.

## From Continental Journals

*Cynolebias bellottii*—Annual Fish from South America

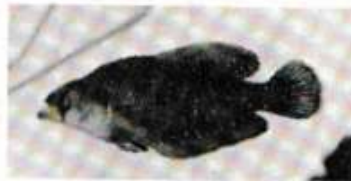
THE extraordinary Argentine Pearl Fish (*Cynolebias bellottii*) is the subject of an article by Dr. E. Meder in the July issue of *DIE AQUARIEN-UND TERRARIEN ZEITSCHRIFT* (DATZ). It is an inhabitant of the Argentine Pampas where it is found in the mudholes and ditches during the rainy season. This fish has a hectic and very short life. During the summer months (December to February) the sun soon dries up the little water holes in which the Pearl Fish are found and they die, but their eggs are buried in the mud on the bottom of the pools and stay there all through the summer season. This despite the fact that the water dries up completely and the ground cracks under the blazing sun.

With the commencement of the rainy season the water holes and trenches soon fill up and within hours the first *Cynolebias* can be found. They grow rapidly and are ready for spawning after about six to eight weeks, when they lay eggs prolifically and without pause throughout the season and through the remainder of their life, which does not exceed eight months. They are so adapted to their extraordinary life cycle that, even under aquarium conditions where they are not exposed to excessive heat and the drying up experienced in their habitat, they die after eight months. This explains why the fish is not

particularly popular and not often found here.

The male fish certainly is most attractive with its indigo-blue colour, and little white spots at more or less regular intervals. He reaches a length of approximately 3 in. The female is far less striking and looks so different from the male that for a long time she was taken to be a different species. Even the number of rays in the dorsal and anal fins vary between the male and the female. The colour of male fishes caught in shallow and clear water is never so lovely as of those caught in deep, muddy holes.

The fish do not apparently require or even like high temperature, 18 to 20 deg. C. (65 to 68 deg. F.) seems to suit them best.



Photograph [G. J. M. Timmerman] A mature male Argentine Pearl Fish.

In their natural surroundings no plants are found but the water is usually inhabited by *Daphnia* and mosquito larvae. They breed easily and readily enough in captivity. Karl Thomas, who was one of the first to study the fish in its natural surroundings and to describe its habits, just removed some of the dried-up mud from the water holes in which the *Cynolebias* had been observed during the rainy season, placed it in a tank and added water. After one week he had about a hundred young fish swimming about. This is all the more surprising as in their natural surroundings one rarely finds more than six fish in each water hole. Whether a high proportion of the eggs is lost through drying up or whether the fish, which grow very rapidly, devour each other, still remains to be discovered.

## Breeding Procedure

To breed *Cynolebias* it is best to use a tank with a base of sterilised mud from a garden pond or of washed and sifted clay. A pair of fish is introduced. Approximately 65 deg. F. is a satisfactory temperature for the spawning. After about a fortnight, the temperature is increased to 77 deg. and the water drawn off. This dry period is maintained for approximately 30 days after which 4 in. of water is added. Only 24 hours later the young fish start to hatch. A concluding article on the *Cynolebias* is promised for the next issue of DATZ and I hope to report further on Dr. Meder's experiences.—H. O. MUNRO.

## AQUATIC PRESS TOPICS

## Relationship of Plants and Fish in Aquaria

MORE and more experts all over the world are coming forward to give their opinion on the balanced aquarium controversy. It is a fundamental point and one on which we must have definite evidence and conclusions. This should be possible—in fact, Mr. van Duijn has pitted the weight of his practical experience and learning on the side of plants insofar as his articles in *WATER LIFE* indicate (October and December, 1952 issues). It is, perhaps, unfortunate that such scientific evidence has not been propounded in the aquatic press by followers of the opposite belief. Statements are all very well, dogmatism may make easy reading but neither is sufficient when we are expected to accept an entirely new complexion to our fish-keeping. When we are faced with scientific evidence we will be the first to give full consideration to the new idea. We have not had that evidence on a sufficiently large scale yet, but, on the contrary, a welter of experiments in support of the belief that plants do play a significant part in oxygenating water, when it is in static tanks, lead us to hang on to our original belief.

Ida M. Mellen (co-author of a tropical fishkeeping book which has maintained its popularity over the years) in the January issue of *ALL-PETS MAGAZINE* (U.S.A.) surveys those who have given allegiance to the "balanced" outlook. It makes impressive reading; William T. Innes, Walter H. Chute (director of America's largest public aquarium, the John G. Shedd Aquarium, Chicago), Robert J. Lanier (sometime connected with New York Aquarium, and more lately Superintendent of the Steinhart Aquarium, San Francisco) and, of course, Mr. C. van Duijn of Holland.

As we said three years ago in this column the relationship of plants and fish, in our tanks might not be in the nature of an apothecary's balance but now, even more than then, we believe that their usefulness as an oxygenating factor is unquestionable in a normally-planted tank, given a full complement of light.

Mr. van Duijn stated that when conditions of carbon dioxide intoxication and oxygen deficiency occur together the symptoms of carbon dioxide poisoning in fish (quite distinct and recognisable by tumbling movement, decreased breathing frequency and no tendency to surface) substitute the signs of oxygen shortage (coming to the surface, snapping air). These observations are based on his own experiments. Yet holders of the opposite idea insist that (except in exceptional instances) when fish come to the water surface gaping this is due to excess carbon dioxide *not* lack of oxygen. Obviously this is a very real clash of interpretation and not observation. If and when we hear a refutation, complete with experimental evidence, of Mr. van Duijn's explanation, we shall at least know we are batting on the same wicket.

FEEDING young Black Mollies to give them the very best start in life is often a headache. That this variety has maintained an even and appreciable price in the last five or six years whilst other types have had their monetary value reduced considerably is a reflection that it is a fish which needs additional care and attention. The early days are naturally important and Mrs. C. Toll, writing in the April edition of the *WINNEPEG EXOTIC FISH CLUB BULLETIN* (U.S.) gives a diet for the first

month of their life. She provides the youngsters with several meals daily. Tinned spinach, chopped and cooked ready for feeding, is given at one of them—"a small piece on a toothpick". Mikro-worms are also offered and shrimp—presumably Brine Shrimp. Even when they are a month old she still feeds four or five times daily, but starts giving them small White Worms and proprietary foods.

TELESCOPING of the aquatic hobby has occurred in New Zealand with the result that the New Zealand Federation of Aquatic Societies has been formed and the *NEW ZEALAND AQUATIC WORLD* now replaces *The Dominion Aquarist and Pond-keeper* and *The New Zealand Aquarium Bulletin* as this Dominion's contribution to world aquarium literature. Editor is Mr. E. C. Powell, an experienced journalist.

PERIODICALLY comes news of double-sword Swordtails (*Xiphophorus helleri*). All appear to go into the limbo but the latest report, in the May issue of *THE AQUARIUM* (U.S.), seems worth noting. The illustration of this particular specimen first took my eye. Here was no freak Swordtail with one robust sword normally positioned and a puny one along the top edge of the tail fin. The upper one looked just as sturdy and developed as the lower. Owner of the fish was Mr. Robert L. Bovee, Binghamton, New York. It was bred by Mr. Charles W. Knickerbocker, Jr., from a male Red Sword which had two swords, but not in particularly good measure. Unfortunately this report has to be in the nature of an obituary—the promising twin-sword fish is in preserve, but there is still hope. Offspring from it are in the hands of Mr. J. L. Zettle, Pennsylvania Fish Commission, who is an expert fishbreeder, so we might be hearing of a Doublesword Sword, strain yet

—L. W. ASHDOWN.

## Big Entry for Sixth N.A.S. Show

Twenty Club's Exhibit Wins Coronation Cup Competition

THE total number of entries accepted for the sixth annual exhibition of the National Aquarists' Society almost reached 950 and some further 300 exhibits were refused through lack of accommodation. Twenty-one clubs competed for the Coronation Cup, the winners proving to be the Twenty Club with a pair of Red Fighting Fish (81 points), the runners-up being Tottenham A.S. with a pair of *Platy, variatus* (77 pts.). Most but not all exhibitors nominated clubs for the N.A.S. Challenge Shield. The N.A.S. and the Goldfish Society were barred from being nominated but Guppy breeders were permitted to nominate the specialist societies or sections to which they belonged and which are affiliated to the Federation of Guppy Breeders' Societies. If all Guppy exhibitors had made nominations and had those nominations been credited to the F.G.B.S. rather than to the local societies or groups, that Federation might have walked away with the shield.

### Leading Positions Shared

As it was, ties resulted for first and second places, the leaders being Bethnal Green A.S. and Mitcham A.C. with 37 pts. each and Hendon A.S. and Enfield A.S. with 25 pts. each. Positions of other nominated clubs were Dunstable A.S. (22), Kingston A.S. (18), Stoke Newington A.S. and Leicester A.S. (17 each), Nottingham A.S. (13), G.B.S. (Eastern Counties Section) (12), West Middlesex A.S., Tottenham A.S. and Marble Arch A.S. (11 each), East London A. & P.A. and Amersham Grove A.C. (9 each), Brighton & Hove A.S. and Slough A.S. (8 each), Uxbridge A.S. (7), Romford A.S. and Hornsey A.S. (6 each), Hampstead A.S. and Merton (L.T.) Garage A.C. (5 each), Riverside A.S., Reading A.S., G.B.S. (West London Section) and Willesden A.C. (4 each), Battersea A.S., Erith

and 29 for individuals. Breeders' teams totalled 51.

To the critical eye of some of the visitors the standard of the exhibits seemed to be lower this year, although the opinion is not reflected in some of the pointings. Were the judges over-generous in their marks or did the poor quality of some of those not in the cards overshadow the merit of those that won? On the whole, we think that the points were a little high here and there but the omission to point some of the classes makes a fair assessment difficult.

The schedule was a good one, bearing in mind that economics as well as space determine the number of classes that can be put on but, even so, we would have liked to see separate classes for Veiltails and Moors and two classes instead of one for Barbs. Amongst the Guppies we noted that one class was for "Top and Lower Swords", "Upper and Lower" would have been consistent but there was no apparent need to depart from the usual nomenclature ("Top and Bottom Swords"). The team of winning Bristol Shubunkins put in by Miss D. Morris of the G.S.G.B. included winners at the 1950 G.S.G.B. Show and a son of one of them. The old 'uns had weathered well and the representative of the next generation also showed considerable promise. The low markings in the class for Veils and Moors should not be compared with the other Goldfish classes since the judge points these fish, especially the Veils, strictly in keeping with the standard and holds the view that so difficult is it to produce ideal Veils that the moderate pointing indicates an achievement as good as that obtained elsewhere in the section.

Class 16 (Danios, etc.) almost justified a sub-division into Danios or Brachydanios and Rasboras or White Clouds. Here the judges must have had a difficult task. So far as the



Photographs [WATER LIFE] Mr. George Cansdale, T.V. Zoo Man, performs the opening ceremony at the N.A.S. Exhibition.

the leading tank in the Club Coldwater class so densely planted as to merit it being pegged back to second place. The shapely fish in the winning individual coldwater tank earned valuable points. We could find little wrong with the placings in the tropical furnished club class but felt that the individual class winner could have made better use of the plant life to show off the fish to advantage. Probably the most difficult class in the show was the inter-club Coronation Class, the eligible entries being a sexed pair of Dwarf Gouramies, Fighters or Platies. This gave rather wide scope and maybe neither Platy nor Gourami enthusiasts would be prepared to concede points to a Fighter entry, though, no doubt with justification, the judges thought the *Betta* pair the best. Breeders' teams are always of interest. Six fishes constituted an entry in the tropical section and four only in the coldwater classes. Knowing his preference for a full six, we must congratulate Mr. Boarder on his impartial judging of fours in Class 16.

### COLDWATER SECTION

#### Mr. A. Boarder's Classes

**COMMON GOLDFISH** (20 entries): 1, 3, M. R. Price (82 pts.), Red, best for body shape and col., 3 (78). Red, nice col. but not quite the dorsal. 2, M. Clutton (81). Yellow, equal finnage, beaten shape of body. 4, E. T. Harris (76). Red, close-up, with good finnage; caudal a little less true to type. **BRISTOL SHUBUNKINS** (36): 1, 2, 4, Miss D. Morris (81), best body col., displays caudal well. 2 (77), not so much blue, good head shape, neat finnage. 4 (73), neat body and good col., but less shapely dorsal fin. 3, J. B. Plumb (74). Fails col. pattern but correct outline and finnage. **LONDON SHUBUNKINS** (17): 1, S. G. Freeman (87), well-developed specimen of good col., shape and size. 2, A. E. Adcock (84). Equal size and shape, but inferior col. pattern. 3, A. B. Lester (79). Not quite the qual., but quite big and with neat dorsal. 4, M. D. Cluse (78). Good dorsal and caudal, body trifle deep, neat col. **FANTAILS** (19): 1, 3, W. C. Webley (90), typical scaled red of the type favoured by this judge with compact body and good fins. 3 (85), from the same strain but not quite the shape. 2, J. H. Dacombe (87), just beaten department, equal in finnage, but less shapely body. 4, W. L. Wilson (82). Another good scaled red of correct proportions, but not showing well.

#### Capt. L. C. Betts' Classes

**VEILTALS AND MOORS** (11): A somewhat disappointing class for numbers. 1, and Strachan Kerr Trophy, J. H. Franklin (68). Veiltail of quite good proportions but not the best possible col., upright caudal and nice flowing tail. 2, W. E. Smyth (60). Moor of reasonable size, good for shape and condition, but col. could be better. 3, F. D. Balham (58). Veiltail, beaten by 1st on shape; nicely developed tail fin but dorsal seemed a little too heavy. 4, T. Funk (56). Moor, fair shape and col. but equal to 2nd in



Left: Mr. Arthur Derham discusses the show with three of the judges, Capt. L. C. Betts, Mr. H. E. Morris and Mrs. F. Perry, F.L.S. Right: Mr. J. H. Gloyd in happy mood with Mr. and Mrs. W. S. Walters, of the Thames Valley A.S. Many of the hobby's leading exponents visited the show.

A.S., Lambeth A.S., Northampton A.S., Forest Gate A.S., Leyton A.S. and Walthamstow A.S. (3 each), Hornchurch A.S., Newcastle A.S., Clapham A.S., Camberley A.S., Study A. & P.C. and G.B.S. (Gloucester Section) (2 each), Feltham A.S., G.B.S. (North London Section), Posters Bar A.S., Sutton & Cheam A.S., Harrow A.C. and Aquarium Club (Fulham) (1 each).

The promoting society agreed at the last moment to let the F.B.A.S. Star Scheme operate. Circumstances, however, prevented the scheme from being adopted in its entirety. Where the judges did point their awards, however, the cards were starred and such points are shown in this report. It is worth recording that in one class (Breeders' Teams of Egg-layers) four gold stars were gained with an average of 94.25 points. Cup winners were:—Irene Perpetual Cup for best individual furnished aquarium, W. C. Webley (coldwater) with 69 points. Plantsman Perpetual Challenge Cup for best exhibit in A.O.S. Tropical Plant class, C. L. Wood (Amazon Sword). Strachan Kerr Trophy for best Veiltail in CL 5, J. H. Franklin (68 points). Trade Cup, Windmill Products; runners-up, South Coast Aquatics.

The class for Barbs attracted the largest entry (60), followed by 41 in that for Danios, Rasboras and White Clouds. The biggest coldwater class was that for Bristol Shubunkins (36). The furnished aquaria section had 52 club entries

Barbs are concerned, the results were hard to criticise though the 3rd award went to a Tiger that showed less well than others of the same species after judging. Similarly, the 4th Nigger Barb seemed a little less showy than at least one other *B. nigrofasciatus*. This is not a criticism of the judge but sympathy for her! Having placed the fishes, she must have felt annoyed that the leaders looked less happy afterwards than they did at the time she pointed them.

### Points for Guppies

One judge only had been engaged to cover the Guppy section totalling nearly 140 entries of different types. He had his hands full and yet managed to complete his task to time. We thought that at least one of the Scarftails was not too true to type and that there was a tendency to give higher marks where there was good colour, occasionally at the expense of excellence in other characteristics. Under the present allocation of points, a fish of outstanding coloration can be passed by more sombre specimens of better body shape and fin development, condition and department. The class for plants were well supported and some nicely developed specimens were seen. Among the Cryptocorynes, one entry of *C. hartwelliana* was unplaced, presumably because young offshoots were present. As a plant it certainly seemed worthy of an award. Turning to the furnished aquaria, we thought

finnage. **ORANDAS AND LIONHEADS:** No entry.

*Mr. H. E. Morris's Classes*

**BRIT. COLDWATER (21):** 1, T. S. Leveridge. Deer of good size and shape. 2, R. C. Harvey. Golden Trench of typical outline, but loses on col. 3, J. E. Ward. Green Trench, small and not showing much col. 4, G. R. Minson. Stickleback, a lively male showing full breeding colours; might have gone up one place. **FOREIGN COLDWATER (6):** 1, E. J. Harris. Well-marked American Sunfish of good size. 2, A. J. E. Jessop. 3, R. A. Harris. Two N. American Catfish (*Ameiurus nebulosus*). The 3rd poorer in col.

**TROPICAL SECTION**

*Mr. C. R. Looker's Classes*

**WORDTAILS (MALE) (25):** 1, C. G. King (88). Red-eyed Red, good col. density, well-developed sword. 2, 3, R. W. Hall (85, 82). Two good Albinos, first leading through exceptional size and caudal development for this variety, body a trifle heavy. 3, D. E. and F. E. Taylor (84). Red Wagtail, nice red, but poor black in dorsal and upper part of caudal. **WORDTAILS (FEMALE) (29):** 1, R. W. Hall (90). Very gd. Albino, but caudal showed slight signs of sword-like development. 2, C. Louden (86). Red Wagtail, beaten body col. and poor black in anal and pelvis. 3, M. J. Fletcher. Green Weisbaden, fair col., reasonable size. 4, D. E. and F. E. Taylor. Red Wagtail of gd. col., but caudal fin could be better. **PLATIES (MALE) (27):** 1, J. H. Franklin (82). *P. variatus*, best of all of this variety on show for col., but trifle small. 2, J. Harris (80). Festival Platy. Extremely fine specimen of gd. size and col., possibly at disadvantage through no standard for this variety existing. 3, Mrs. N. Russell. *P. variatus*, better size than leader, but not its col. 4, P. Bryant. Neat Red up against a gd. trio. **PLATIES (FEMALE) (22):** 1, 3, F. H. West. 1 (90), Red Wagtail. Excellent size, but col. of underparts a little pale; 3 (85), Large Lemon Wagtail. Gd. qual., but not clean edge to caudal marking. 2, H. Deamer (86). Moon. Large and shapely but black mark of uneven density. 4, R. W. Hall (83). Red. Of nice shape, moderate col., rather small. **MOLLIES (32):** 1, 2, C. Louden. 1 (86) Male Velifera. Of gd. col., big dorsal, body not overlarge. 2 (84), Male Velifera. Equal shape, neat dorsal, but less well developed col. pattern. 3, W. T. Cliffe (83). Black Sailfin. Not very large, gd. density of col. 4, K. D. Fawcett (80). Permbblack. Of gd. intensity of col., but not the best body shape.

*Mr. H. S. White's Classes*

**GUPPY SECTION. MALES—DOUBLE-SWORDS & LYRETAILS (20):** All Double-swords in the cards. 1, E. A. Davey (79); 2, C. Farmer (78); 3, 4, W. G. Leak (77 and 76). Leader showing best caudal extensions with second well up for shape of finnage generally. **TOP & BOTTOMSWORDS (9):** All Bottomswords in the cards. 1, 2, E. S. Lloyd (81 and 80); 3, W. A. Richardson (74). Leading pair well ahead on caudal fin extensions, leader better col. **SCARFTAILS (18):** 1, 2, C. Farmer (85 and 84); 3, 4, T. A. Marshall (82 and 73). Gd. class of this variety with leading pair showing gd. sweep of caudals. We did not think 3rd winner so typical. **VELTAILS (21):** 1, E. A. Davey; 2, 3, L. J. Wilson; 4, E. S. Roach. Not much to choose between this quartette though 4th might have gone up one position on size and shape. **ROUNDTAILS & ROBSONS (14):** 1, C. Farmer (84). Robson. Gd. ptd. dorsal, nice body col.; 2, H. C. Sharpe (78). Robson. Not the col. and caudal not so well rounded; 3, 4, G. S. Rutt (76 and 72). Roundtail and Robson. Roundtail showing gd. col., but dorsal trifle ugly and caudal of fair shape. Robson beaten body shape and size of dorsal. **COFFERTAILS (9):** 1, G. E. Tansley (84); 2, G. S. Rutt (81); and 3, W. R. Burwell (80). Nice trio, with leader possessing best caudal and with gd. col. marking on dorsal. **SPEARTAILS & PINTAILS (11):** 1, 2, E. S. Lloyd (72 and 69). Pintail and Speartail. 1st showing nice round caudal with true pin-like extension. 2nd not the most even tapering of spear; 3, 4, H. Esterbrook (65 and 55). Pintails. Both with gd. dorsals and reasonable pins, but overall shape and size not so gd. **FEMALES—COLOURED (20):** 1, E. A. Davey (76); 2, R. C. Harvey (74); 3, E. S. Roach (73); 4, W. R. Burwell (68). Very little between them for colour patterns but leader of excellent shape

and size. **GREYS (8):** 1, F. Hills (88); 2, K. F. Nutt (79); and 3, J. Rudkin (76). Leader wins on even col. and neat transparent fins. Nos. 2 and 3 in this class were disqualified. **A.O. COL. (9):** 1, 2, H. Esterbrook (80 and 78), both Gold-laced. Leader showing black edgings more distinctly; 3, A. B. Lester (75). Gold. Of nice size and col.

*Mr. G. W. Kingston's Classes*

**FIGHTERS (17):** 1, C. Louden, male Red *Betta splendens*. Neat body shape and gd. finnage, bright red; 2, W. A. Richardson, male Blue. Of equal size, col. not too even; 3, W. T. Cliffe, male Red. Equals 1st for size, but beaten col. and fin development; 4, G. Boyles, neat male Cambodia. Of nice shape and col., moderate finnage for variety. **CATFISH (36):** 1, G. W. Murford, *Corydoras paleatus*. Of gd. col., bold hd., typical of species; 2, J. R. Herbert, *C. aeneus*. In good cond., but not very big; 3, J. H. R. Leggett, Bubble Nest Catfish (*Hoplosternum thorocatum*). Gd. body markings, typical shape; 4, W. J. Holdstock, *C. melanostilus*. Showing gd. dark marks and head spots. **HYPHESSOBRYCON SPECIES (27):** 1, 4, W. T. Cliffe. Both *H. serpa*, leader showing

pattern well; 2, W. Norcross (86). Rosy Barb (*B. conchonus*). Quite big and of nice col., showing spot near caudal well; 3, M. A. Green (85). Tiger Barb (*B. tetrazona*). Not the biggest we have seen, gd. shape, col. of bars could have been more intense; 4, H. Julian (84). Nigger Barb (*B. nigrofasciatus*). Very gd. specimen for col. with pronounced barrings but a little poor in shape. **A.O.S. CHARACINS (27):** 1, A. Whatford (88). *Meiyunis schreiniulleri*. Large specimen of gd. silvery body col., fine shape and showing characteristic marks; 2, J. H. R. Leggett (87). Blind Cave Fish (*Anoptichthys jordani*). In excel. cond., colouring showing well; 3, A. G. Hill (86). Black Widow (*Gymnocorymbus ternetzi*). Gd. size and outline, but not the best col.; 4, F. H. West (84). Hatchet Fish (*Gasteropelecus larvis*). Very clean looking and in tip top form, gd. deep body and well proportioned caudal fin.

*Mr. J. Carnell's Classes*

**CICHLIDS (34):** 1, 2, M. A. Green (96 and 96 pts.). Two very fine Flag Cichlids (*Cichlasoma festivum*). Leader perhaps a shade bigger and in better condition; 3, D. Cannon (95). Marbled



Left: Mr. H. S. White cheerfully tackles the task of pointing the Guppy classes. Right: Mr. J. Carnell takes a close look at some of the big Cichlids which attracted much attention from the show visitors.



better red in fins with neat black dorsal marks. 3, R. H. Fuller, Neon (*H. innesi*). Of gd. shape and size, but lacking brilliance of luminous blue-green lateral line; 3, F. H. West, *H. serpa*. Nice outline and gd. size, but less dense reds and blacks.

*Mr. J. H. Gloyd's Classes*

**A.O.S. LABYRINTH (36):** 1, R. W. Hall (82). Pearl Gouramies (*Trichogaster leeri*). Large, correct outline and showing dark lateral marking, but could have better overall body pattern; 2, F. H. West (81). Giant Gourami (*Colisa fasciata*). Showing gd. bands but general col. could have been better; 3, K. D. Owen (80). Blue Gourami (*T. trichopterus samatransis*). Nice shape, showing its spots well, but body col. fair; 4, R. W. Alford (79). Thick-lipped Gourami (*C. labiosa*). Very steady, fair size, gd. col. **DANIOS, RASBORAS & W.C.M.M. (41):** 1, 2, J. H. R. Leggett. Two gd. Giant Danios (*D. malabaricus*). 1 (85) better shape with prominent stripes; 2 (81) neat, but not quite so typical or so large; 3, F. H. West, White Cloud (*Tanichthys albonubes*). In gd. order, but typical lines not too pronounced; 4, A. Whatford (78) *Rashora trilineata*. Gd. colour on caudal.

*Mrs. B. Robertshaw's Classes*

**BARBS (60):** 1, E. F. Russell (91). Checker Barb (*B. oligolepis*). Gd. size, showing body



Mr. W. Cleveland admires the Amazon Sword Plant which gained the Plantsman Cup for Mr. C. L. Wood in the show's plant section.

Cichlid (*Astronotus ocellatus*). In gd. order, looking very much like the first winner at Manchester, where it earned 87 1/2 pts.; 4, C. D. Stoker (95). Marbled Cichlid. Loses on size and marking. **DWARF CICHLIDS (11):** All *Apistogramma ramirezi* in the cards. 1, R. E. Churchman (95); 2, F. A. Ahrens (94); 3, A. Hart (91); and 4, F. A. Ahrens (90). The second class to be highly pointed and so gaining for the first three fish cards with gold stars.

*Mr. H. E. Morris's Class*

**A.O.S. TROPICALS (24):** 1, J. R. Thompson, Glass Fish (*Ambassis lala*). Of gd. size, in first class cond.; 2, A. Kimber, *Aplochelilus lineatus*. Spots and barring showing up well; 3, R. E. Churchman, Flying Fox (*Hyalocorymbus kalopteris*), with distinctive stripes, gd. size and shape; 4, F. K. Oliver, Reed Fish (*C. calabaricus*). Not very colourful, but an interesting exhibit.

**BREEDERS' SECTION**

*Judges: Messrs. C. R. Looker and H. S. White*  
**TROPICAL LIVEBEARERS (Teams of 6) (34):** 1, J. Harris (88). Festival Platies, bred 9/12/52. Well grown for age, with every sign of making up into useful adults; 2, F. H. West (83). Albino Swordtails, bred 3/1/53. Looking a little small, but pleasing in shape and caudal growth; 3, H. Julian (78). Green Swordtails, bred Sept., 1952. Showing red in fins, fair size for age; 4, D. Redman (71). Halfbeaks (*Dermogenys pusillus*), bred 25/2/53. Might have gone higher in view of their rate of growth and mature appearance.

*Mr. J. Carnell's Class*

**TROPICAL EGGLAYERS (Teams of 6) (28):** 1, R. Gilbert (95). Lyretails (*Aphyosemion australe*), bred 16/12/52. Very evenly matched team; 2, W. A. Bone (94). Lyretails (*Aphyosemion australe*), bred 30/3/53. Rather small as yet but already beginning to show colours; 3, F. Bates (94). Blue Gularis (*Aphyosemion coruleum*), bred 3/10/52. Might have been a little bigger, but typical and promising for colour; 4, W. A. Bone (93). Catfish (*Corydoras meyeri*), bred 4/12/52. Showing typical *Corydoras* shape with distinct coloration of species, could be a little more evenly matched to make winning team.

(Continued on page 222.)

## N.A.S. SHOW—Contd.

Mr. A. Boarder's Class

**COLDWATER** (Teams of 4) (9): 1, R. C. Harvey (84), Bristol Shubunkins, bred 12/7/52. Nearly a year old and looking potential winners with good body shape and fins developing well; 2, J. H. Dacombe (80), Veils, bred 20/6/52. Nice quartette of Calicos showing nice body shape and col., but finnage not so big as might be expected for age; 3, J. H. Dacombe (79), bronze Scaled Veiltails, bred 19/7/52. Very close up and with equal shape; 4, F. D. Balham (78), four nice Moors for shape, but will have to improve in colour.

## AQUATIC PLANT SECTION

Judges: Mrs. F. Perry and Mr. W. Cleveland  
**VALLISNERIA & SAGITTARIA** (15): 1, A. B. Lester, well developed *Vallisneria spiralis*; 2, R. W. Hall, *V. spiralis* var. *toria*, of almost equal quality, gd. size for variety; 3, K. F. Nutt, *V. spiralis* var. *gigantea*, showing wealth of leaf of good shape; 4, T. H. Marshall, *V. spiralis* var. *toria*, nice texture, but less prominent twists.  
**AMBULLA, MYRIOPHYLLUM & CABOMBA** (20): 1, A. B. Lester, *Cabomba*, nice fan-shaped foliage; 2, C. E. Wood, *Myriophyllum*, trifoliate coarse leafage, but of gd. size; 3, S. W. J. Franks, *Cabomba*, of reasonably gd. shape; 4, R. W. Hall, *Cabomba*, smaller whorls, but gd. col. and shape.  
**CRYPTOCORYNES** (23): 1, 2, 3, H. Julian, nice trio of *C. cordata*, *C. Griffithii* and *C. Willissii*, hard to separate; 4, A. B. Lester, *C. Willissii*, not quite so well coloured as 3rd. This class contained a very good example of *C. bartlettiana*, possibly only one of the cards as it had young plants still attached. **A.O.S. SUBMERGED** (20): 1, C. L. Wood, a large and well-proportioned Amazon deservedly awarded the Plantsman Cup; 2, Mrs. P. V. Elgar, *Aponogon crispus*, showing nice lanceolate leaves; 2, A. E. Falkus, *Aponogon*

*undulatum*, with nice broad leaves of gd. col.; 4, S. W. J. Franks, *Egeria (Elodea) densa*, with very dark foliage, nicely spaced and well formed.

## FURNISHED AQUARIA SECTION

Judges: Capt. L. C. Betts and Mr. H. Morris  
**INTERCLUB COLDW.** (16): 1, Stoke Newington A.S. (79). The choice of Calico Veils as the fish gave gd. contrast to dense planting with some pleasing *Elodeus* and *Nuphar*; grey rockwork seemed a little too preponderant; 2, Bethnal Green A.S. (76). Rather overpowering *Sagittaria* spoiled balance but smooth, well-worn rockwork compensated as did the gd. qual. Bristol Shus.; 3, West Middlesex A.S. (75). A variety of plants, with Hairgrass to the fore, were well placed amongst tasteful rocks to create an avenue-like effect which gave gd. swimming space for Bristol Shus. Overall appearance slightly artificial; 4, Henson A.S. (74). Golden Drift gave splash of colour to rather dull tank, with rockwork a little unhappily placed. Qual. of fish and plants largely offset other faults.  
**INDIVID. COLDW.** (6): 1, W. C. Webley (69). Awarded Irene Trophy. Slightly sparse planting counteracted by presence of some very nice Red Scaled Fantails. More rockwork and thicker planting would have made an ideal tank. 2, R. C. Harvey (66). Better rockwork and neat planting, though some of the aquatics seemed a little below standard. Bristol Shus. showed up well; 3, J. H. Franklin (59). Reasonably gd. Calico Veil looked quite happy amongst well grown plants but down-pointed through bad siting of rocks and wrong choice of compost.

Judges: Mrs. F. Perry, F.L.S., Mrs. B. Robertshaw, Mr. W. Cleveland and Mr. J. H. Gloyd  
**INTERCLUB TROP.** (36): 1, Handon A.S. A well-designed layout, with excellent plants including some particularly nice red and normal *Myriophyllum*. Colour of rockwork blended

well with the whole picture though we thought the attempt to emphasize stratification created impression of artificial laminated layers of slate. Harlequins and Serps showed up well. 2, Leyton A.S. Beacons and Glowlights were shown off nicely by a thick background of plants, to which tufts of *Acorus* gave relief. The rockwork seemed a little weak and the pebble-like appearance looked a little out of keeping; 3, West Middlesex A.S. Happy selection of fishes and the Harlequins included were of good order. The background was a little sparse in places though a creditable attempt was made to get a valley-like effect running to the back, giving a sense of depth to the design; 4, Marble Arch A.S. Here Characins figured prominently, with some nice *Thayeria obliqua*. Indiscriminate intermixing of the different plants seemed a fault and there was a slight clash between the grey rockwork and the reddish compost.  
**INDIVID. TROP.** (23): 1, L. J. Mansell. Variety of gd. fish, including Harlequins were provided with a gd. background of rockwork, but poor planting made us think this a lucky win; 2, T. S. Hobday. Beacons seemed happy in this tank with its modest but well placed quantity of rockwork and well designed planting arrangement; 3, F. Barry. Neons, Harlequins and Beacons seemed a little too numerous to make the tank worthy of a higher card, well worth its place on general design; 4, H. A. Hallett. Another nice effort, but upgraded on quality of fish, plants and rockwork rather than on planning.

## CORONATION CUP CLASS

Judges: Messrs. C. R. Looker and J. H. Gloyd  
**INTERCLUB (True Pairs)** (21): 1, Twenty Club (81). Two well-developed Red Fighters of excellent quality, col. superb; 2, Tottenham A.S. (77). Very nice pair of *Platy. variatus* of gd. size and col. pattern.

## Kings Lynn Society's Coronation Show

INCLUDED in the Borough of Kings Lynn's official programme of Coronation festivities was the annual show of Kings Lynn A.S., attended by over 3,000 visitors during its fortnight duration.

There were four sections. For the one devoted to marine exhibits a Crayfish, a Spider Crab, Edible Crabs, native shore fish and several sea anemone species were on show.

Housed in the next room was the herpetological section where some interesting reptiles and amphibians were staged. Each vivarium was artistically decorated and the section was of considerable interest to the public.

In another room was the tropical section, the majority of the tanks here were furnished by members in competitive classes, but the section organiser, Mr. A. J. Staden, B.A., contrived to control the types of fish so that too much repetition was avoided. Among the exhibits were Marbled Cichlids (*Astronotus ocellatus*) obtained from London Zoo and Blind Cave Fish (*Anoptichthys jordani*) from Cambridge.

The coldwater exhibit was staged in a partly covered-in courtyard. A pool and waterfall had been set up in this section. The whole show area was decorated with palms, ferns, and potted plants on loan from the Borough nurseries.

Lord Wise, Mayor-elect of Kings Lynn, made an official visit and presented the cups and shields for best furnished aquaria, best fish in show, best breeders' exhibit and best pair of fish,



Photograph [Eastern Daily News] Mr. A. J. Claxton, chairman of Kings Lynn A.S., handling some of the reptile exhibits used in the herpetological section at his society's show.

won by exhibitors in the tropical section. A ballot was held during one day of the show and visitors were asked to vote for what they considered the most interesting exhibit. The tropical section as a whole was an easy winner.

## Red-eyed Red Swordtail Best Fish at Northenden

RECENTLY-formed Northenden Community Association A.C. invited the Altrincham A.A. to compete in its first show during June. Judging the exhibits was Mr. E. Chapman. He awarded Mr. L. Brown's Red-eyed Red Swordtail the WATER LIFE Diploma for best fish in show. The aquaria show was held in conjunction with the Northenden Community Association's Arts Festival.

## CLASSES

**TROP. FURN. AQUARIA:** 1, Northenden A.C.; 2, Mrs. S. Taylor; 3, Altrincham A.A.  
**COLDW. FURN. AQUARIA:** 1, Altrincham

A.A.; 2, Northenden A.C. **A.V. GOLDF:** 1, 3, L. B. Keeble (Shu. & Common); 2, K. H. Pimlott (Common). **A.O.V. COLDW. FISH:** 1, 2, 3, L. B. Keeble. **A.V. GUPPY:** 1, A. S. Bruce; 2, Miss J. Atkinson; 3, S. Taylor. **A.O.S. LIVEB:** 1, 2, L. Brown; 3, L. B. Keeble. **A.S. LABYRINTH:** 1, L. Brown; 2, S. Hayes; 3, G. Gregory. **A.S. CHARACIN:** 1, G. Gregory; 2, 3, Miss J. Atkinson. **BARBS:** 1, 2, S. Taylor; 3, T. Humphries. **CICHLIDS:** 1, 2, K. Owen; 3, M. Rose. **A.O.S. EGGLAYER:** 1, S. Taylor; 2, G. Stone; 3, A. S. Bruce. **FOUR EGGL:** 1, K. Owen. **FOUR LIVEB:** 1, A. Pimlott; 2, 3, L. Brown.

## Metynnis Takes Diploma at Haslingden

OF the 157 individual fish entries which, with over 30 furnished aquaria comprised the first show of Haslingden A.S., Mr. J. R. Shaw's *Metynnis schreiermulleri* was adjudged the best fish in show. It was a two-day event, staged in the town's Co-operative Hall, and was visited by several parties of school children. Judges were Messrs. R. E. Legge and A. Snape. Manchester Microscopical Society put on an attractive display.

## PRIZEWINNERS

**MEMBERS' TROP. FURN. AQUARIA** (9): 1 and cup, H. Woods; 2, W. Taylor; 3, F. Holden.  
**OPEN TROP. FURN. AQUARIA** (16): 1 and spl., Mrs. J. Dodsworth; 2, Mr. and Mrs. A. Wardle; 3, D. Baldry. **OPEN COLDW. FURN. AQUARIA** (8): 1 and cup, Mrs. I. M. Fletcher; 2, J. Dodsworth; 3, D. and H. Loder. **GUPPIES** (25): 1, R. Rawlinson; 2, D. and H. Loder; 3, R. Preston. **A.O.S. LIVEBEARER** (29): 1 and spl., D. and H. Loder; 2, J. R. Shaw; 3, F. Taylor. **FIGHTERS** (6): 1, J. Rhodes; 2, H. Hoyle; 3, Mrs. D. Loder. **A.O.S. LABYRINTH** (10): 1 and 2, W. Swales; 3, Mr. and Mrs. A. Wardle. **BARBS** (14): 1, C. A. Blake; 2, E. Edwards; 3, G. D. and J. Brimshaw. **A.S. CHARACIN** (18): 1, J. R. Shaw; 2, V. Stephenson; 3, Mrs. R. Rawlinson. **ANGELS** (8): 1, Mr. and Mrs. A. Wardle; 2, Mrs. F. E. Finders; 3, W. Taylor. **A.O.S. TROP.** (19): 1, J. R. Shaw; 2, C. A. Blake; 3, Mr. and Mrs. A. Wardle. **A.V. GOLDF:** (21): 1 and spl., D. and H. Loder; 2, J. Dodsworth; 3, A. R. Thompson. **A.O.S. COLDW.** (7): 1, R. Haworth.

## Royal Photographs

SPECIAL interest has been shown in the pictorial Coronation section of the last issue. Several prints of merit came from *Picture Post* Library. They were those showing the ponds of Kensington Gardens (p. 149), a lake in Sandringham Estates (p. 150), East Terrace of Windsor Castle, Dutch garden of Kensington Palace, Frogmore (p. 151), Long Water and a large circular pool at Hampton Court Palace (p. 152).

## News from the North-west

## Welsh Char in the Deep Llanberis Lake

FIELD-WORK this summer has taken me to several interesting haunts of water subjects. These have included the Upper Wharfe in the Pennines at Grassington, where there is the little Freshwater Crayfish, and Rostherne Mere, near Altrincham, in East Cheshire, in search of Britain's only freshwater smelt. The latter have not been trapped there for many years and may well be extinct. In the northern part of Snowdonia I was pleased one day in June to see, growing in the bed of Llyn Idwal near Ogwen, the rosettes of Water Lobelia and the tiny, thread-like tufts of two very rare and interesting mountain aquatics, *Awl Wori* (*Subularia aquatica*) and Quillwort (*Isoetes lacustris*), which open their unusual flowers under water. Common Water Starwort was also there. Water Lobelia also grows in nearby Lake Ogwen, in the shallow, 2 ft. deep part.

On the other side of the mountains is the long, deep, cold lake of Llanberis, the haunt of Welsh Char or Torgoch. When one of these fish was exhibited in the aquarium at London Zoo a few years ago it was claimed in some quarters as the first to be shown in aquaria. But I see in the recently-produced 17th edition of the "Visitor" Guide to Southport, in a short history of the old Winter Gardens Aquarium of eighty years ago, that its enterprising curator, Mr. M. H. Read, in 1874 included Welsh Char in his tanks. He had an astonishing collection of freshwater and marine fishes, including a 66 ft.-long tank of sharks, a 5 ft. Sea Perch or Bass (said to be the largest ever captured), and a number of marine species reputed to be absent from the famous aquaria at Brighton, the Crystal Palace and Manchester.

## Residential Course

One of the most enthusiastic north-western disciples of what Dickens called "ditchwateristics", is Dr. L. Holdsworth, biology master of Wolstanton Grammar School, in the Potteries. Director of Studies at a residential "Countryside in Spring" course at the Wedgwood Adult College in Staffordshire this June, he had a room turned into a laboratory with several microscopes and troughs of water life—dragonfly larvae, aquatic beetles and plants—collected on the field trips by this four-day course along the Barlaston "Downs", the local canal, and beside Betley Mere. Students found the insect-catching bog-plant Sundew (*Drosera rotundifolia*) on the "Downs". An old boy of the Holt School at Liverpool, and a graduate of the University there, Dr. Holdsworth infused his course of adults and sixth-formers with his enthusiasm. Even Zeus himself seemed to join in, for almost every day the rains descended without damping the enthusiasm of the members—all suitably provided with their wellington boots for pond-collecting.

Another North-westerer is Mr. John Clegg, re-elected chairman of the British (formerly Empire) Naturalists' Association, and now residing at Haslemere, in Surrey, where he is curator of the educational museum in the High Street. Formerly at Scarisbrick New Road, Southport, and then at Moss Farm, Alderley Edge in Cheshire, he went south after the last war and a year or two later took up his present position. He is author of two WATER LIFE booklets and "Wayside and Woodland" books on freshwater life and pond-hunting.

## Societies Around Merseyside

The aquarium societies in Merseyside seem to be taking a more stable, and less divided, turn. In 1926 a Merseyside Aquarium Society was formed but lasted only ten years. The four post-war societies have now resolved themselves to two. A new Wallasey society was short-lived and the Liverpool and District Aquarium Society, formed in 1949, met too far out in the suburbs to make a wide appeal and it has now petered out. This leaves the Merseyside Aquarists' Society in a strong position with a membership of 61 and an average attendance of 40 at its meetings on alternate Thursdays in the Y.M.C.A. in Mount Pleasant. Its recent A.G.M. elected Mr. A. H. Hart, of 4, Grace Road, Liverpool, 9, President (an enthusiast for double sword Guppies with a dozen tanks

at his home). Secretary is Mr. S. Messenger, 14, Aconbury Place, Liverpool, 11, and the treasurer is Mr. R. Napier.

The society's chief activities are table shows about every other month and aquarium exhibitions at garden fêtes and flower shows. One of its most enthusiastic younger members, Mr. A. Bland, of Meols (Wirral), is a successful breeder of Fighters and hybrids. Like so many modern aquarium societies, it is, in the words of its President, "badly off for scientific members". Under Mr. A. R. Thompson's enthusiasm, the district also has a branch of the Goldfish Society of Gt. Britain, and at Southport the local members of the Guppy Breeders' Federation are strong enough to meet regularly together.

On the night of July 4-5, the Merseyside Naturalists' Association held the first of its two seashore collecting sessions. The date is chosen when the low tide and the moon are convenient,

for collecting is always better at night than by day. Using a bungalow in the pinewoods on Formby shore as their base for meals and sleep, members utilised four Lancashire "putters" or push-shrimps with 7 ft. wooden beams and nylon or cotton nets. The catch was, on the whole, disappointing and consisted mostly of shrimps, lesser Weaver Fish, baby sole, dab, and plaice, three types of crabs and a Queen Scallop (probably from the Isle of Man). The party got foul of a mud bank during the night and, on another collecting trip at the next low tide on Sunday midday, their nets were choked with fluke-spawn. The shrimp part of the catch was separated by riddle and boiled and salted at the bungalow. It was then eaten at a 4 a.m. meal before members slept in hammocks. A better catch is anticipated for the September fixture. Secretaries who live near suitable sandy coasts, where nets and thigh-boots can be obtained, might find this a good idea for a nocturnal meeting of marine aquarium-keepers. The new marine biological station for North Wales at Bangor University is making good progress under Dr. Cripps.

## Local Societies Participate in Kettering's First Effort

## Kettering

SOCIETY'S first annual competitive show was open to members of societies in the area. The Mayor of Kettering opened the event and Mr. C. D. Roe was the judge. Mr. Roe was of the opinion that the standard of the tropical fish was very high, and he has a hard task placing the awards.

Over 2,500 people attended, including a number of organised parties of schoolchildren. The local naturalist society had a most instructive exhibition of coldwater plants and each of its 22 tanks contained a different type of water life. The same club also had reptiles, etc., on show. The Nene Catchment Board provided a representative collection of coldwater fish. Seven societies entered in the competitive section and Kettering narrowly defeated Leicester by 290 points to 276 and so won the inter-society trophy. Hand-painted engraved plaques were given as prizes. WATER LIFE Diplomas went to Mr. W. J. Harris (best egglayer, a Harlequin) and Mr. D. Small (best livebearer, a Red Swordtail). INDIVID. TROP. FURN. AQUARIA: 1, S. Hunt; 2, S. Simons; 3, R. Knight. INDIVID. COLDW. FURN. AQUARIA: 1, 2, H. Ward, Jr.; 3, K. Speaks. BREEDERS' TROP.: 1, D. Wright (Angels); 2, S. Simons (Black Widows); 3, H. Ward (Pristellas).

## Roses Show at Burnley

THE second annual Roses Show was arranged by Burnley A.S. at the Lucas Assembly Rooms, when Mr. G. T. Iles judged the entries. Lancashire was the winning county with 63 points. Mr. and Mrs. A. J. Wardle showed the best furnished aquarium and won a WATER LIFE Diploma. Mr. Shaw's *Metynnis schreitmülleri* was best fish in show and was awarded a similar diploma. Mr. Loder exhibited a number of interesting animals, including a boa-constrictor, a Leopard Snake and a S. American Alligator.

TROP. FURN. AQUARIA: 1, Mr. and Mrs. Wardle; 2, Hadley; 3, Scaife. FIGHTERS: 1, Mrs. Loder; 2, Wilson; 3, Shaw, A.O.S. ANABANTID: 1, Barker; 2, Halifax A.S.; 3, Statham. BARBS: 1, Ince; 2, Greenhaw; 3, Baldry. CHARACINS: 1, Shaw; 2, Grice; 3, Ince. CICHLIDS: 1 and 3, Blake; 2, Mrs. Flinders. GUPPIES: 1 and 2, Rawlinson; 3, Shaw. MOLLIES: 1, Loder; 2, Ince; 3, F. Taylor. A.O.S. LIVEB.: 1, Shaw; 2 and 3, F. Taylor. A.O.S. TROP.: 1, Grice; 2, Walsh; 3, Hamer. SINGLETAIL GOLDF.: 1 and 2, Anderson; 3, Wall. DOUBLETAIL GOLDF.: 1 and 2, Loder.



Members of Leicester, Northampton and N. Bucks societies setting up their exhibits at the Kettering Show. On the left is Mr. H. Ward of Leicester, an aquarist who has been connected with the hobby for some 25 years.

## Toxicity of Tar Acids

OUR Water Analyst recently tested a sample taken from a garden pond, made of cement, in the Broadstone, Dorset, area, which had been painted with a bituminous paint to prevent seepage. The report stated that the water gave a strong positive reaction for the presence of tar acids (phenolic substances) in a concentration which would be fatal to fish life.

We questioned whether there was need for caution when advising the use of bitumen paint to cover pond surfaces. In his reply our Analyst writes: "The findings of these phenolic bodies was undoubtedly due to the use of bituminous paint to cover the surface of the pond. Tar acids are extremely detrimental to fish life and many years ago (1932) a series of experiments were carried out for the Thames Conservancy, to find out the effect and toxicity of the soluble constituents of road tar washings upon fish life.

"The test fishes used were Golden Carp, and from my notes made at the time we found that a concentration of 10 parts per million of phenol caused within one hour a loss of equilibrium, partial narcosis, and sudden collapse without spasms. Five parts per million of phenol caused a loss of equilibrium in four hours. The base acridine is especially toxic for it was found that only 0.75 parts per million was sufficient to cause alarming gulping, with sudden complete collapse within 50 minutes." It may, therefore, be seen that coating cement ponds with unsuitable bituminous paints is to be avoided.

## Marine Society's Progress

A STEADY increase in membership is reported by the British Marine Aquarists' Society, although numbers are still small. The animal and sea-water supply scheme has been started and a small library founded. In addition, a panel of speakers has been formed for the benefit of outside societies. New address of the secretary, Mr. W. Pugh Thomas, is 35 Meols Drive, Hoylake, Cheshire.



## AQUATIC TRADERS' ASSOCIATION

## Mr. A. H. Boughton's Challenge to the Trade

THE paper prepared by Mr. A. H. Boughton, which was first considered at the A.G.M. of the Aquatic Traders' Association, was debated further at the subsequent June 9 meeting, to which all traders, whether members of the A.T.A. or not, were invited.

In addition to the points in Mr. Boughton's paper which we reported in our last issue, the following views were put forward by him:—

A number of newcomers to the trade have opened up businesses and have relied on cutting their prices in order to attract trade, but there has been not only on their side, but also on the side of established businesses, too much sitting back and waiting for the business to roll in.

## Encouraging Fishkeepers

To improve business it is necessary to increase custom, which means more spending on the part of the aquarium keepers and/or bringing more people into the hobby. Aquarium keepers must be encouraged to develop their hobby. I refer here to the aquarists who are interested in the hobby from the point of view of study, or of fish breeding and exhibiting. To bring more people into the hobby, they must be attracted to the aquarium as a means of decorating the home in an interesting and animated fashion, as apart from a means of nature study. An aquarium, artistically arranged, illuminated and stocked with brightly coloured fish, displayed in the window with a label to the effect that "This can be in your home for the sum of only . . .", and with an invitation to obtain details inside, should help.

The A.T.A. could possibly help to bring more people into the hobby by contributing towards the cost of advertising public shows in local papers, or they might suggest a contribution towards such advertising by members of the trade situated in the area. Aquarium Clubs and

Societies have not the necessary funds available.

If the A.T.A., by advertising public shows, getting dealers together, holding open meetings for trade discussions (which may be attended say once or twice a year by all traders, whether members or not) then the trade will be able to see for itself what the Association is, and the value or otherwise of joining it.

If it is agreed that gate-crashing by people not previously connected with the trade or hobby is undesirable, A.T.A. certificates of fitness to practise as a professional aquarist should be issued. The dealer requiring such a certificate would have to provide the Association with a statement from his local Club, signed by both Chairman and Secretary, to the effect that the Committee of that Club consider him to have sufficient knowledge and experience in aquarium matters to be capable of giving reliable advice to beginners to the hobby. The A.T.A. could make a charge for the Certificate, and although it would not be obligatory on any A.T.A. member to have such a Certificate, the value of it displayed in his shop might be apparent to a good many. At the present time a newcomer to the hobby must form his own opinion as to whether the dealer is reliable or not. I think Aquarium Clubs would be more kindly disposed towards the trade and would in fact recommend dealers, if they felt that we were trying to protect the public against exploitation by those with no real interest in the hobby. The scheme would also be a form of deterrent to such gate-crashers.

The chairman (Capt. L. C. Betts) thought the time had come when a majority vote could be taken on outstanding issues and that, from the voting the Council could decide whether any action was necessary. It was unanimously carried that "The aquatic trade is capable of expansion" and from that modest start a number of motions was put.

answer is yes. If that is so, it appears that there is a distinct possibility of the Guppies described by Dr. Spurway being produced not actually without fertilisation but, though this is not normal of usual, by fertilisation whilst the young female was still undeveloped.

A further speculation arises. In a tank where Guppies have been mated or even where there has been a male but mating has not necessarily been accomplished and the tank has not been sterilised, can there be the possibility of even a single male sperm being still alive in the water? Could such a sperm live long enough and eventually be the cause of delayed fertilisation in a young female? Any useful deduction would be of interest and value to all Guppy breeders.

## New Public Aquarium

CHESTER Zoological Gardens, home of the North of England Zoological Society, has recently constructed a new Aquarium. There are 80 tanks, those indoors ranging from 13 to 1½ ft. in length. Daylight usually offers sufficient illumination but artificial light can be supplied. A feature of the new building is a 240 ft. long aquarium on the roof, which can be viewed from the inside of the building through glass ceiling panels. When weather permits six fountains play into this roof aquarium. Within the building there is a central semi-circular pool into which comes a controlled flow of water from the roof aquarium.

## A.S.L.A.S. Show

A FORTY-TWO class event was arranged by the Association of South London Aquarist Societies for its annual show at the Adult School Hall, Benhill Avenue, Sutton, from July 29-August 1.

The Association is contemplating running a "coldwater" judges' course. Clubs should send their nominations to Mr. S. Davies, 16 Milton Road, Wallington, Surrey.

THE Pakistan A.S. has been formed. The Secretary is Mr. S. Maqsood-ul-Hasan, Gandhi Gardens, Karachi, Pakistan. A show has been planned for August and co-operation with aquarists in other countries is sought.

## Pet Animals Act, 1951

A BARNESLEY reader of WATER LIFE, who breeds fishes, was approached by the Local Authority's housing agent and sanitary inspectors. They informed him verbally that, in their opinion, since he sold surplus stock to other aquarists, he was liable to take out a pet shop licence under the terms of the above Act. The reader consulted the Legal Adviser of WATER LIFE, who asked him to get the Local Authority to put in writing the grounds on which they based their decision.

After an informal talk and an inspection of the reader's tanks, the two officials were asked by the reader to peruse the June, 1952, copy of WATER LIFE in which we outlined how aquarists might be affected by the Act. He subsequently submitted to the Council a letter from WATER LIFE in which we said that in our view he did not come within the provisions of the Act. The reader now writes: "They (the Council) have been perfectly satisfied with the WATER LIFE ruling and have told me to forget about it and carry on with my hobby. They also said they were sorry for causing all the trouble."

May we remind readers that if they are informed by the local authority that they regard his or her sale of animals as constituting a business which must be licensed, our readers should check whether or not exemption can be claimed. WATER LIFE's Legal Adviser will be pleased to give advice in case of doubt and will, if necessary, make representations to the authority concerned.

THE Institute of Biology has arranged a Symposium on the Biology and Productivity of the Sea, at the Royal Geographical Society's headquarters, Kensington Gore, London, S.W.7, on September 18-19. Tickets for non-members cost 15/-. Full details from the General Secretary of the Institute, Tavistock House South, Tavistock Square, London, W.C.1.

## Films and Filmstrips

SECRETARIES frequently enquire of us if any films on aquatic subjects are available for hire. As we explain to these officials, a selection of such films are listed in Part III of the catalogue issued by Educational Foundation of Visual Aids, 33 Queen Anne Street, London, W.1, price 2/9d., post paid.

Another kind of media is the modern filmstrip. The list is continually growing and appropriate subjects now available are listed in the 1953 catalogue of Common Ground (1951) Ltd., 44 Fulham Road, London, S.W.3. They are (1) "Life in a Pond"; (2) "Life in a Stream"; (3) "Life on the Seashore"; (4) "Hydra and Obelia"; (5) "Protozoa"; (6) "Water Plants"; (7) and (8) two dealing with "Development of a Frog". The first three treat their subject in a simple manner and the other five on a more advanced scale. Societies with facilities to show filmstrips could build up an instructive evening's programme with a selection of two or three. The strips (18 mm x 24 mm) are sold complete with textbook, permitting the demonstrator to give a detailed description of each picture.

We have seen these strips and consider them and their accompanying notes most useful material from which to build up an instructive and interesting variation to the usual club programme.

## N.A.S. Visits London Zoo

TWO visits to London Zoo have been arranged for National Aquarists Society's members. The first was to the Reptile House on July 14 and the second, at 3.15 p.m. on Sunday, September 6, will be to the Aquarium where visitors will be taken behind the scenes.

## Societies' Shows

REPORTS of societies' competitive shows sent to WATER LIFE should preferably be typewritten, but in any case should be concise and written in double-line spacing.

AT the May meeting of Croydon Tropical Breeders' Circle, Mr. F. C. Katritzky, F.R.H.S., lectured on "Water Plants and Their Culture," using an epidiascope to illustrate some of the subjects discussed.

## Was it Spontaneous Parthenogenesis?

THE report by Dr. Helen Spurway of Guppies produced without apparent fertilisation, referred to in your last two issues, opens up a wide field for discussion, writes Mr. A. G. Birch, of Leicester, a member of the East Midlands Guppy Breeders' Society.

The male spermatozoa are deposited and live in the semen, a jelly-like fluid. These male cells are extremely mobile in this fluid and are able to move a considerable distance, if necessary, to come into contact with the female ova. Spermatozoa may continue to exist in this state for a long period. The question of time assumes importance as most probably do the conditions of suspension and temperature.

It is said that all ova or eggs that can be delivered in a lifetime are in the body of a female from birth and that these ova only become ripe for fertilisation, either singly or in groups, at specific intervals. We are told that a single fertilisation of a female Guppy is capable of providing at least four or five broods of young, at approximately monthly intervals. We are also informed of the possibility that a second male contact, at any time after the first delivery of young before the fifth brood would not influence the first five broods but would fertilise later broods.

## Ten Consecutive Broods

From another source comes the information that from sperm deposited with the female at one time by a male livebearer as many as ten consecutive broods of young can be produced by the female in the subsequent absence of males. This is a fact to be remembered when selective breeding of livebearers is intended; though as a rule, in some species, newly-deposited sperm may take precedence over stored sperm in fertilisation. In other species such as the Mosquito Fish (*Heterandria formosa*), consecutive broods are under simultaneous development but at different stages of such development. In this case sperm deposited subsequently will not affect them.

Is it possible for the sperm to remain dormant, awaiting the ova to ripen? Apparently, the

## Club Notes and News

The Editor invites clubs to send brief reports of meetings and announcements of forthcoming events for publication. Items for the October-November issue should reach this office by September 11.

FIFTY entries were received for the June 18 table show of **Kingston A.S.** Earlier in the month Mr. McInerney spoke on "Breeding the More Difficult Egglayers." Three days after the talk a visit to Mr. McInerney's establishment was made. Mr. Stratford spoke primarily on livebearers at the July 2 meeting. The fourth annual exhibition will be held at the Y.M.C.A. Hall, Eden Street, Kingston-on-Thames, from September 2-5. There are 21 classes and entries should be sent not later than August 22 to Mr. A. Beckett, 13 Plough Road, West Ewell, Surrey.

AT the Sheerness Arts and Crafts exhibition **Sheppey A.S.** this year staged a display of 10 furnished aquariums.

MR. SMITH of Cambridge set up an aquarium to illustrate his lecture at the June meeting of **Peterborough A.S.** He also judged a table show in which first prize-winners were Messrs. Budding, Stockdale, Larkman and Richards. A Dwarf Gourami exhibited by Mr. Larkman was best fish in show.

THE June 3 meeting of **Lambeth A.S.** heard a talk on "Plants" by Mr. R. E. V. Billings. A visit has been made to Messrs. Whitwell & Smykala's establishment at West Bergholt.

"BREEDING CHARACINS" was the subject taken by Mrs. Hemming for her lecture to **Shirley & South Birmingham A.S.** in June. There will be an outing to Bristol Zoo and the Cheddar Caves early in September.

MEMBERS of the **Oldham A.S.** visited R. Jackson's Nurseries at Hale on June 10.

TWENTY entries were received for the tropical table show of **West Surrey P. & A.C.** on June 10. First prizewinners were Messrs. C. Way and W. Worsfold. A cold-water table show has been arranged for August 12.

MR. LAW visited the **Tottenham A.S.** July meeting and spoke on "Angels and Giant Gouramis." This society is participating in a programme of interclub shows with other local societies.

THE **Bath A.S.** held its open show in the Concert Hall at the Pump Room from July 23-25. There were 29 classes and judges were Mrs. W. M. Meadows and Mr. A. Boarder.

MEETINGS of newly-formed **Stourbridge A.S.** are held on alternate Thursdays at St. Thomas's Church Hall, Stourbridge. Secretary is Mr. F. V. Hillman, Brockencote House, Chaddesley Corbett, Kidderminster, Worcs., and he gave a talk on "Tropical Fish-keeping" at the June 4 meeting. Members examined Infusoria cultures on June 18.

AN illustrated talk on "Vivaria" was given by Mr. G. M. Barbrook at the June 23 meeting of **Huddersfield A.S.** First prize-winners in a table show held during the same meeting were Miss Hobson and Messrs. Hobson, Garner and Weir. Best fish in show was Mr. Hobson's Spanner Barb. Venue for the annual show is the Parochial Hall, Springwood Street, Huddersfield, and the dates are September 26-October 3.

THE secretary of **Merseyside A.S.** is now Mr. S. Messenger, 14 Aconbury Place, Liverpool, 11.

ANNUAL exhibition of **Leicester A.S.** will be held in St. Mark's Church Schoolroom, Belgrave Road, Leicester, from August 27-29. Speakers at the June and July meetings were Messrs. S. B. Scargill and A. Wilson Smith.

MR. W. C. WEBLEY has addressed a recent meeting of **Nottingham A.S.** He has also judged a junior section table show for Common Goldfish.

A NEW committee was elected at the June 17 meeting of **Norfolk and Norwich A.C.** Serving officers are chairman, Mr. C. W. Williamson; treasurer, Mr. L. Smith; and secretary, Mr. R. D. Aldridge. Taylor Road, West Eastham, Norfolk. Messrs. Ellis and Stott have been booked to give lectures at future meetings. A ramble has been arranged for August.

THERE was an interesting programme at a recent meeting of **Romford A.S.** It included a novices' table show of Barbs (won by Mr. Adamson), a judging competition, a treble-chance quiz, an auction and a Brains Trust. Mr. A. Boarder has spoken to the members and judged a table show, awarding Mr. F. Ahrens first prize.

LONDON ZOO has been visited by members of **Sutton & Chess A.C.** On June 16 a table show was held in which Messrs. J. J. Ketchell and B. Tailing were the first prizewinners.

MIDLAND Association lecturer, Mr. E. J. Druce, spoke at the June meeting of **Burton-on-Trent A.S.**

IN the **Bethnal Green A.S.** show on September 11-12 classes for club furnished aquaria (tropical and coldwater), for breeders' exhibits (livebearers, egglayers and coldwater) and for the London Area Fighting Fish Championship are open. In addition there are 12 members' classes. Schedules can be had from Mr. W. A. Richardson, 98 Warner Place,



A MATTER OF TASTE?

London, E.2, and entry forms should be returned by August 14. The show will be held in the Bethnal Green Institute, 229, Bethnal Green Road, E.2.

AN attendance of 4,000 was recorded for the Coronation-week competitive show of **North of Scotland A.S. (Aberdeen).**

ON June 16 **Merthyr Tydfil A.S.** welcomed Mr. R. Forest Jones, B.Sc., and Mr. J. Martin to its meeting. Mr. Jones spoke on "Fish Diseases" and Mr. Martin discussed the breeding of egglayers with particular reference to Angels and Fighters. Commencing June 23 meetings are held at fortnightly intervals on Tuesday evenings.

A SMALL aquaria display was put on by the **Aquarists' Section of Standard-Kolster Social & Athletic Club (Sidcup, Kent)** at the annual fête on July 18.

SECRETARY of **Gainsborough A.S.** is Mr. W. L. Burton, 15 Portland Terrace, Gainsborough, Lincs.

AS a result of the **Iford A. & P.S.** annual meeting the President is Mr. Haywood, the chairman, Mr. Jarvis, the treasurer, Mr. Adkins and the secretary, Mrs. D. M. Wilson.

COMMENCING with the July 8 fixture, meetings of **Walworth A.C.** are held on alternate Wednesdays at Lorrinmore Hall, Oldney Road, London, S.E.17. Officers elected at the A.G.M. were Mr. Morgan, chairman; Mr. Oxlade, treasurer and Mr. F. L. Howe, 9 Hettle Road, Hampstead, N.W.3, secretary. Members have enjoyed a visit to McLynn's Aquarium, Ewhurst.

A NEW treasurer and secretary were elected at the A.G.M. of **N. Birmingham P. & A.S.** The holders of these offices are Mr. F. Neale and Mr. T. H. S. Walkinshaw, respectively.

CHAMPIONSHIP and novice trophies are competed for at table shows of **Reading A.S.** A number of these shows have already been held and others will be arranged for the remainder of the year. More entries are required from the members.

MEMBERS of **Aylesbury A.A.** enjoyed an outing to the River Thames area on June 14. Next table show is one for tropicals on September 2 when Mr. Norman will be the judge.

"FEEDING FISHES" was the title of a talk given by Mr. W. H. Brooks at the June 10 meeting of **Coventry P. & A.S.** On July 8 the President, Mr. Hardyman-Jones, spoke on "Pond Life" and there was also a table show.

FOUR additional trophies will be up for competition at this year's open show of **Bristol A.S.** Judges are Mrs. W. Meadows for the tropical section and Messrs. B. Meadows and C. J. Saunders for the cold-water classes. The event will be held in the Y.M.C.A. Hall on October 2-3. Thirty-six classes are scheduled and details can be had from Mr. R. Woodbine, 18 Grantham Road, Kingswood, Bristol. On July 13 Professor Harris gave a lecture on "Behaviour of Fishes." A number of meetings will be held in which coldwater and tropical enthusiasts will be catered for separately.

THE **Hull P. & A.S.** is staging an exhibition of coldwater and tropical fish in East Park, Hull, from August 1 to 3. This is in conjunction with a Bank Holiday Gala. The club is now affiliated to the Northern Federation. June and July activities included a lecture by Mr. A. K. Wilson, a Brains Trust session and two outings. A lecture by Mr. E. W. Nicklas will be heard on August 17 and on September 5-6 an exhibition is to be held in the Hull Co-operative Institute, Kingston Square, Hull.

(Continued next page.)

## Club Notes and News

— continued —

**FOURTH** annual exhibition of **Banbury A.S.** will be held in the Town Hall from September 24-26. Thirty classes are listed. Particulars can be had from Mr. R. A. Butler, 225 Warwick Road, Banbury, Oxon. Judges are Messrs. A. Beardley and Z. Webb.

**NEW** members will be welcomed at the meetings of **Riverside A.S.** held in "The Hampshire Hog," King Street, Hammer-smith, London, W.6. These are arranged for the first and third Mondays of each month.

**MR. T. RANSOM** was the first prizewinner in an exhibition staged by **Dunstable A.S.** in conjunction with a local "Old People's Fête." Mr. R. Holland spoke at the June 23 meeting on "Spawning and Rearing Barbs." Winner of the table show for Shubunkins was Mr. J. H. R. Leggett.

**FIRST** prizewinner at the annual table show of **Folkestone A.S.** was Mr. D. Howland. A challenge cup was up for competition in the furnished aquaria exhibition on July 10-11. The judge was Mr. S. T. Jelly. Aquarists on holiday are invited to the meetings which are held on the first and third Thursdays of each month at Folkestone Public Library.

**ALL** classes are open in the third annual show of **Blackpool & Fylde A.S.** to be held in the Congregational Schoolroom, Victoria Street, Blackpool, from September 14 to 19. The judges will be Messrs. J. H. Gloyn and Snape. Entries should be sent by August 1 to Mr. W. Robinson, 3 Denwood Bank, Warton, Preston. Mr. B. Conroy, a junior member, spoke at the July 9 meeting.

**NEW** secretary of **Epsom A.S.** is Mr. P. L. Pennell, 12 Worple Road, Epsom, Surrey.

**A** **SMALL** display was put on by the **Barnsley A.S.** at a local agricultural show on July 18.

**PRESENT** secretary of **Rochdale A.S.** is Mr. A. Holmes, 15 Harrow Avenue, Rochdale. Winners of **WATER LIFE** diplomas at the annual show were Messrs. C. A. Blake and A. N. & K. Rycroft. Over 300 entries were staged. Recent activities have included a lecture from Mr. Stott, a trip to Chester Zoo and a table show for Characins.

**A** **NEW** society has been formed with the title of **Wisbech A.S.** Officers are: chairman, Mr. G. Darby; treasurer, Mr. R. Clayton and secretary, Mr. D. A. Eagle, 8 Beechwood Road, Wisbech, Cambs.

**THE** **Aquarists' Section of the Lyons Club** (London, W.14) put on a display of twelve tanks at the Lyons Carnival on July 18.

**A** **FREE** advice service on fishkeeping for the general public is now provided by the **Keynsham A.S.** Since the society was formed it has arranged a course on fish biology at Bristol University.

**NEW** secretary of **Hampstead A.S.** is Mr. K. J. A. Pye, 35 Steeles Road, Hampstead, London, N.W.3. An exhibition was put on at Wharrie Halls, N.W.3, on July 4.

**MEMBERS** of **Southend, Leigh A.S.** have paid a visit to the establishment of Mr. McInerney at Ewhurst.

**A** **T** the Associated Equipment Company's 21st Gala Sports day on July 4 **Southall A.S.** staged a display of furnished aquaria. The A.E.C. gave a trophy for competition and this was won by Mr. A. Hastings. As the winner over the last six months table

shows, Mr. Savage was presented with a cup and plaque at the July 8 meeting. Twenty tanks will be staged at the Southall Borough Show from August 1 to 3.

**THE** **Chester A.S.** staged a display at a local fête on July 25. The club's show will be held in the Town Hall, Chester, on August 22. It will comprise six classes.

**NEW** name of the Catford club is **Catford Aquarists' Society.**

**BEST** fish in show at the third open show of **Wembley A. & P.A.** was a *Cichlasoma festuatum* shown by Mr. M. A. Green. It received 93 points and took the **WATER LIFE** diploma.

**THE** **Horsham Water Life Society** has been formed with Mr. E. G. Pankhurst, 223 Crawley Road, Horsham, Sussex, as secretary.

**ENTRIES** for the open show of **Midland A. & P.S.** should be sent to Mr. T. L. Dodge, 48 Dunsmore Road, Hall Green, Birmingham 28 by August 10. There are 43 classes in which 19-trophies will be competed for. Venue of this event is the Minor Hall, Bingley Hall, Birmingham, where it will be staged from August 27-29.

**TABLE** show first prizewinners at the June 18 meeting of the **East Midland Section of the F.G.B.S.** were Messrs. H. Esterbrook, W. Burwell and J. Rudkin.

**FIRST** table show arranged by **Merton (L.T.) A.C.** was a success with the club shield won by Mr. A. Driver. In July the club enjoyed an outing to Bognor.

**A** **T** a recent meeting of the Nelson A.S. it was decided to reorganise the society. Its name is now **Nelson Aquarium Society** and the officers are chairman, Mr. R. Metcalfe; treasurer, Mr. N. Yates and secretary, Mr. R. Muffitt, 32 Barkerhouse Road, Nelson.

**THE** **B.B.C.** producer, Mr. Barney Colehan, attended a recent meeting of **Redhill A.S.** when he heard a lecture on "Egglayers" given by Mr. P. Hewitt.

**ANNUAL** cup show of **Wembley A.S.** was held on June 6. Mr. Reed gave a lecture on June 16 and Mr. Russell Holland spoke at the beginning of July.

**THERE** were 12 entries in the coldwater table show arranged by **Friends (Herne Hill) A.S.** Mr. H. St. Ledger won first prize. A week later Mrs. I. Bakewell's Neon Tetra took premier award in a table show.

**FIFTH** annual open show of **Hendon A.S.** is running from August 3-8 in Hendon Park, London, N.W.4.

**A** **TALK** on "Hints and Tips" was given by Mr. R. Yates at a recent meeting of **Ashton-under-Lyne A.S.**

**THE** **Northenden Community Association A.S.** is hoping to promote an open show during October.

**MR. J. ROWEN** brought several live fish along to illustrate his lecture at the May meeting of **Birkenhead A. & H.S.** In July, Mr. N. Taylor lectured on reptiles.

**THE** Mayor of Willesden presented the society's cups at the annual dinner and dance of **Willesden A.C.** Winners were Mr. Fuhrman (Breeder's Cup); Mrs. Lynch (best tropical fish); Mr. Wingrove (best coldwater fish); Mrs. Lynch (Tropical Points' Cup); Mr. Wingrove (Coldwater Points' Cup) and Mr. Cook (Novices' Cup). First prizewinners in the Coronation show were Mrs. Lynch and Mr. Wingrove. Both were awarded cups. Willesden were the winners in an inter-club show with Harrow A.C. on July 6. The open show takes place on September 12-13.

## Programme for Dutch National Congress

**A** **S** announced in our last issue, Haarlem A.S. will be acting as organisers of, and hosts to visitors at, the National Congress of Aquarists sponsored by the Netherlands Federation (N.B.A.T.) on August 14, 15 and 16. The venue is the Brinkman Restaurant, Haarlem, where the Congress opens on the Friday at 7.30 p.m. There is to be an official reception by the Lord Mayor of Haarlem, followed by a show staged by the local society. The programme includes a film show by Dr. J. M. Lodewijks, projection of colour slides by H. T. Sniijders and a dinner on the Saturday, followed by a cabaret and dance. Spread over two days, a number of talks covering numerous subjects will be given.

Should any British aquarists decide to go to the Congress they will be given a hearty welcome. It would be advantageous were they to contact the Conference Secretary, Mr. N. G. Michielsen, Voorduinstraat 20, Haarlem, Holland, by letter beforehand.

## Plastics for the Aquarist

**THE** 1953 British Plastics Exhibition, organised by our sister journal *British Plastics* with the support and co-operation of the British Plastics Federation, turned part of Olympia into a colourful display of articles used in the home as well as in commerce and industry. Made from coloured plastics compounds and moulded into almost every conceivable shape, they covered a wide range.

The aquatic trade has introduced a number of pieces of apparatus for the fishkeeper made from plastics and, provided a sufficient number are turned out to cover the initial high cost of the moulding tools, there is much scope for still more to be produced.

## On Coarse Fishes

**A** **S** the result of the success of the "Life in a Freshwater Lake" course arranged by the Department of Extra-Mural Studies, University of London, it is hoped to have another weekend of study, this time on "Coarse Fishes". Tentative arrangements have been made for it to be held at Battle of Britain House, Northwood, Middlesex, from October 23-25. Admission, including board residence, will be about 25/-. There will be a survey of the natural history of fishes, with reference to feeding habits, reproduction, and other matters. There will be an opportunity for a practical examination of scale development and the digestive system. Applications for admission may be sent to the Director, Department of Extra-Mural Studies, University of London, Senate House, W.C.1.

## Encouraging the Young

**I** **N** the June "News Letter" of the Salamander Junior Pet Club, a prize is being offered to the member who writes the best account of his or her favourite pet.

This club, which is open to all young folk interested in keeping animals, is run by a panel of knowledgeable naturalists. For a yearly membership fee of 7/6d. they offer advice on anything from water life to birds, insects, reptiles, and all usual and unusual pets. Further details can be obtained from the Secretary, 35a, Lonsdale Road, London, E.11.

The **Southern A.A.** meets at Fabian House, Richmond Place, Brighton, on alternate Mondays at 8 p.m. All visitors and holidaymakers interested in aquaria are invited to attend. A breeding competition is in progress and a competition planned for September. Mrs. H. M. Wright, 2 Rotherfield Crescent, Brighton, 6, is now secretary, with Messrs. Keen and Coldman, chairman and treasurer, respectively.

A trip to Southsea Aquarium, viewing the Harrow A.C. film and show preparations have kept **Southampton A.S.** busy. The society maintains five tanks in local hospitals and children's homes.

## Central London Venue for Guppy Federation's Show

Six Classes for Non-members—Inter-section Furnished Aquaria Contest

VENUE for this year's annual show of the Federation of Guppy Breeders' Societies is St. Martin's School of Art, Charing Cross Road, London, W.C.2. Date is Saturday, September 19, when benching will be from 10 a.m. to midday and duration of the show from 2-8 p.m.

There are two interesting innovations at this year's event. One is the provision of six classes open only to non-members (these include two for breeders' exhibits) and the other is an inter-section furnished aquaria class where the only fish which may be introduced are Guppies. Judging here will be to F.B.A.S. furnished aquaria rulings. In addition to the foregoing there are 18 classes for F.G.B.S. members, including two breeders' classes. Entries in both the open and members' breeders' classes will consist of four fish from one brood and of the same sex. All exhibits will be eligible to compete for the F.G.B.S. Challenge Trophy which, with ten other cups, will be up for competition.

Copies of the show schedule can be had from Mr. W. Howe, 24 Kerfield Crescent, Grove Lane, London, S.E.5. Entry forms, together with fees at 1/- per entry, should be sent to Mr. Howe by September 5.

The society has recently produced a handbook entitled "The Guppy Breeders' Guide for Beginners". It runs to fourteen pages of text and is sold at 6d. per copy, plus postage.

Messrs. H. S. White, A. P. Stanley and E. S. Roach were presented with life membership addresses at a recent assembly. At the same fixture Mr. Myers received a replica of the Roach

Cup to recognise his winning of the Doublesword class at the annual show for three successive years. After discussion the draft show rules were accepted. A motion by the Rules Committee that members should belong only to one section was approved.

As a result of the N. Surrey Section's A.G.M., its officers for the forthcoming year are Mr. J. E. Edwards (chairman and publicity), Mr. C. Pavitt (secretary), Mr. M. Pavitt (treasurer) and Mr. G. Kirby (show secretary).

## Importation of Pompadours

THE connoisseur had a treat just a few weeks back. Wending their stately way about a tank at Kingsland Fisheries, London, W.14, were four fully-grown pairs of Pompadour Fish (*Symphodon discus*). Robust, though always decorous, they arrived on Sunday, June 21, none the worse for their journey by air. Forty-eight hours later two pairs had been sold.

Whilst the Pompadours seemed thoroughly well-mannered and delicately took single worms for sustenance, another species in the same shipment, *Monocirrhus polyacanthus* (Leaf Fish) gorged live Guppies voraciously. Twenty of these fish arrived and they, too, were fully grown. Other interesting tropicals, which arrived in the consignment were Scats (*Scatophagus argus*), *Monodactylus argenteus* and, possibly available for the first time commercially in this country, *Therapon jarbau* and the unusual Characin *Hemiodus semitlanius*.

## Aquarists' Internationale

THE *Aquarists' Internationale*, functioning on a correspondence basis, is operating actively, resulting in letters being received regularly by members in all parts of the world. Here are summaries from correspondence sent to Mr. R. W. Andrews of London.

MR. GENE WOLFSHEIMER, Los Angeles, writes: "I have accidentally bred and raised a male albino *Betta*—complete with pink eyes. This specimen resulted from a normal *Cambodia* spawning. It appears that *Betta* albinos are somewhat of a rarity, so naturally every effort is being made to mate this particular male with a top class female orchid-coloured *Cambodia*. Although this female is quite definitely interested in accomplishing a spawning, the male is apparently so short sighted, that she fades too quickly from his vision and this leaves him little incentive to spawn even though he has blown a fine, large bubble-nest." Mr. Wolfsheimer also supplied the interesting information that, although a rarity, Black Sharks are occasionally available at various dealers' shops. Recently he saw a

specimen of *Labiobicolor*, which was jet black to peduncle, this latter being bright red. There seems some controversy as to whether there are two colour varieties or if the red tailed (peduncle) type is the male of the species.

Mr. Rodney Jonklaas, Ceylon, writes: "Have you ever heard of a Piebald *Betta*? Well, one dealer here has been raising them from an original freak for over four years. Not very attractive but definitely rare, the bodies of both sexes having both *Cambodia* and normal *Betta* colouring. Another rare *Betta* I have is one with a whitish body overlaid with very light blue, and fins also blue with red tips—a regular *Coronation* *Betta*!"

"We have every imaginable kind of *Platy* here except the latest German breed with black stripes and the elusive blue. But the whites we have are really fine—pure milk white with blue-black eyes. Now we have white *Tuxedos* and white *Wags* too, from my own experiments. As for *Swords*, almost every variety is present here, even the Albinos, which I alone possess. The albinos do not breed regularly or well, and I suspect my females devour their young."

Nominations are called for by September 11. The election will take place at September 26 Assembly.

## Latest News

MR. R. S. WIGG, 17 Ham Lane South, Llantwit Major, Glamorgan, is hoping to form a society in his area. Interested fanciers should contact him. The Altrincham A.A. is now affiliated to the Northern Federation. Members will hear Mr. R. Jackson give an illustrated talk on "Reptiles" at their August meeting. New address of the secretary of Thames Valley A.S., Mr. D. P. Creese, is 19 Elm Tree Avenue, Esher, Surrey. The society supported Surbiton's horticultural show on July 4. Apart from cold-water and tropical fish, judged by Mr. C. Minnett, there was a pond and an herpetological display, put on by Messrs. Izzard and Brown. Recent lecturers have been Messrs. Cooper and Seymour. Mr. W. L. Mandeville spoke on the history of fish and the rearing of fry at the July meeting of Nuneston P. & A.S.

At the A.G.M. of Cardiff A.C., Mr. C. C. Dawkins, 109 Gabalfa Avenue, Gabalfa, Cardiff, was elected secretary. Nuneston P. and A.S. holds a show on August 3. Mr. D. Tunnicliff, 283 Edward Street, Nuneston, is now secretary. The annual show of East London A. & P.A. takes place on September 24-26, at St. Margaret's Hall, Barking.

## Goldfish Society's Annual Meeting Decisions

WITH no written nominations received for the posts of secretary and lay-member prior to the A.G.M. of the Goldfish Society of Gt. Britain, Messrs. C. J. Saunders, B.Sc., and R. Birkenhead, respectively, were nominated from the floor of the meeting and elected unanimously.

The committee had, after reviewing the financial state of the society, decided that an increase in the annual subscription was unavoidable. It proposed that the revised figure should be £1 1 0. The chairman, in presenting the committee's motion, said expenses worked out at approximately £1 per member each year. After discussion and an amendment "that the subscription be increased to £1" had been carried by 23-7, the committee's motion was put before the meeting and carried unanimously. The statement of accounts was also carried. Elected as auditors for 1953-54 were Messrs. Birkenhead and Goodwin.

Whilst Capt. I. C. Betts and Messrs. C. J. Saunders and W. L. Wilson judged the show for adult Singletails and year-old Twintails, Mr. R. J. Affleck, M.Sc., M.R.S.T., gave an illustrated talk on "Colour Pattern in Goldfish". After the tea interval Mr. E. G. Weatherley demonstrated hand-spawning. Chief prizewinners in the show were Mr. P. Upchurch, Jr., who won the Upchurch Trophy for best adult Singletail and Mr. C. F. Whitehead who took the Betts' Cup for best year-old Twintails.

## Herpetologists Meet

MEMBERS of the British Herpetological Society's London Group brought along a Black-pointed Tegu, a Glass Snake, two Tree Snakes, *Python reticulatus* and *Heloderma suspectum* to a recent "Lizards and Snakes" evening, when there was an interesting discussion.

A new approach to the subject of herpetology was made at the June meeting when Mrs. M. Green and Mr. J. Lester spoke on "Reptiles and Amphibians in Art and Literature". Stamps, brooches, ornaments, cigarette cards and advertisements with a reptilian or amphibian motif were on display. Mr. Lester read extracts from old works on herpetology and the books were shown to members. Those present felt that a search through literature would reveal sufficient new and interesting material for a further meeting on the same topic.

## No Longer Experimental

WE have referred in past issues of WATER LIFE to successful attempts to import tropical fish by air from the Far East. Through personal knowledge of some of the pioneers, including Mr. C. D. Roe, of Birmingham, we have been able to follow the progress made and see the way the difficulties met with have been overcome.

British Overseas Airways Corporation announces the transport of fish by air as an established and growing freight trade. To meet the needs of aquarists all over the world, B.O.A.C. showed interest in the production of a special type of pressurised container in which fish can be flown long distances without harm. Prototypes of the can were examined by us some months ago at the invitation of Mr. M. Marks of Exotic Trade (Naturalists) Ltd., but we refrained from publishing details at his request. It has been possible to trans-ship by air fish from Singapore to London and from London to New York and further afield, with negligible losses. Mr. Marks informs us that he is working on a new development which will permit greater numbers of fishes to be transported at less cost.

B.O.A.C., who first let York Aircraft be chartered for special deliveries of fish from Singapore to London Airport, and now have a normal tropical fish traffic of 500 kilos a week, expect very soon to build up the total to 1,500 kilos—enough to fill completely the cargo hold of a Stratosphere.

Electratemp Supplies draw attention to an omission from their advertisement in the June-July issue. The full address of their factor for the S.E. England and London areas, Mr. Barry M. Austin, is 230 Staines Road, TWICKENHAM, Middlesex.

## F.B.A.S. Area Association

SOUTH-WEST Middlesex Aquarist Association, which held its second meeting at the beginning of June, is the first body to come within the Federation of British Aquatic Societies' area group scheme. The S.W. Middlesex secretary is Mr. A. J. W. Wilson, "Parkside", Uxbridge Road, Feltham.

A total in excess of 490 has been received as a result of F.B.A.S. Flood Appeal. Three-dozen societies, not all of them affiliated, have made donations apart from a number of individuals. The Isle of Sheppey, Kings Lynn and Yarmouth societies, of which only Kings Lynn is affiliated, will receive allocations from the fund. These three societies have 16 aquarists in their areas who will receive help. A donation from the fund will be sent to fishkeepers in Holland.

The credit balance at 26.6.53 was £317 8s. 2½d. Seven new affiliations are reported; five societies have been deleted from the roll and two have withdrawn. The total of affiliations remains in excess of 100. Mr. G. Willis has had his name added to the panel of speakers. A revised list of judges, as at July, 1953, has been circulated. The Judges' and Standards Committee recommend that marine exhibits should be staged in separate classes. Mr. R. E. V. Billings' resignation from the Council and the Finance Committee necessitates the election of a new council member.

## CLASSIFIED ADVERTISEMENTS

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## Trade Notices

**WEST BROMWICH** Aquatics for all Aquatic Supplies. Tropical and Coldwater Fishes. Postal service by return. S.A.E. for lists or visit us at 117a, Paradise Street, West Bromwich.

**GRINDAL** Worm, 2/6 culture; Vallisneria torta, Ludwigia 6/-, Hygrophila 4/-, Cabomba 8/- dozen; good selection 5/-, 10/-, 15/-; all post paid. The Aquarium, 132, Roman Road, London, E.2.

**TROPICAL** Fish, Plants, Tanks and Equipment. Bensteads, (R. E. Barber) 22, Park Parade, Harlesden, N.W.10. Hours of business 9 a.m.—6 p.m. Thurs. 1 o'clock. Phone: Elgar 4826. Fish houses viewed by appointment.

**THIS** is our line. "Aquaria", Tropical Fish and all accessories. 1932 to 1952 on the Spot. Our hobby as well as business. Baldry's (Prop. M. Baldry (Mrs.)) Warner Street (2 min. centre), Accrington. Tel. 2264.

**A. G. BISSELL**, The Portland Aquaria. Tropical and Coldwater Fish, Plants and all aquarist's appliances. 79, Portland Road, South Norwood, London, S.E.25. Buses 197 and 12 pass door. 3 min. Norwood Junction. Telephone: ADD 3676.

**CULTURES** with detailed instructions. Micro-worm 2/6, Whiteworm 2/6, Grindalworm 3/6; Three assorted for 6/6. Euglena infusorians—easy, reliable, odourless, 3/6; Tropical fish, plants and equipment. Uplands Aquarium, 213, Sandwell Road, Handsworth, Birmingham.

**OUR** 10/- parcel of plants and snails is outstanding value, up to ten varieties sent during summer: Thirty Tropical Plants in at least six varieties and twelve red snails, 10/-; Eighteen Tropical snails, four varieties, 3/6; Six small Ampullaria, infusoria snails, 3/-; Twelve Malayan snails, 3/-; Twelve Red Ramshorn snails, 2/6. All post paid. Breeding stock of tropical fish usually available for callers only. Open week-ends. Thos. H. Marshall, Aquaria House, 26, Westbury Lane, Buckhurst Hill, Essex.

## Appliances

**NEW** aquariums neatly welded angle iron, 24 x 12 x 12, 35/-; 24 x 12 x 15, 40/-; 36 x 12 x 15, 57/6; all-over light covers for same 15/- and 22/6. 93, Hatton Road, Bedford, Middx.

**EASY TERMS.** Heaters. Thermostats. Aerators. Aquarium Frames and Stands, and all accessories. Straightforward Easy Terms arranged. Send stamp for illustrated list and particulars. Joseph Sanley Ltd., Aquaria Experts, 17, Smallbrook St., Birmingham, 5.

**AQUARIUM** frames in 1 in. steel angle Painted. 18 x 12 x 12, 12/6d.; 24 x 12 x 12, 16/-; 24 x 12 x 15, 17/-; 30 x 12 x 15, 19/-; 36 x 12 x 15, 21/-; 36 x 15 x 15, 23/-. Carriage free. C.W.O. special sizes, Stands. Trade lists. Oriol Metal Co., Oriol Road, London, E.9.

**MICROSCOPES**—Suitable for examining tank water. A few very good instruments with standard lenses (new) at £12 10s. (carriage 7s. 6d.). Second-hand microscopes. Please call, if possible, as we cannot undertake to send on approval. Deepes Ltd., 35, Beak Street, Regent Street, London, W.1. (Gerrard 2560).

## Appliances—continued

**BUILD** your own Aquarium. Angle Iron and Pressed Steel Frames now available from stock. Frames and Stands made to customers' requirements. Despatch 7-14 days. Enquiries answered by return. Acton Works, 256 Commercial Way, S.E.15.

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**AQUARIUM** Frames: Constructed from 1' x 4' Angle iron. Fully mitred and ground corners. Jig welded, free from twist, dark green finish. Sizes: 36" x 15" x 12" 24/-, 30" 22/-, 24" 20/6d., 18" 19/-, 36" x 12" x 12" 22/-, 30" 20/6d., 24" 19/-, 18" 17/6d. Approximately 30 standard sizes; S.A.E. for full list. Two tier stands 36" x 12" 40/-, 30" 37/6d., 24" 35/-, 18" 32/6d. Single tier 36" x 12" 32/6d., 24" 31/-, All-over aluminium Top Covers, holes each end for bulb holders 36" 26/-, 30" 24/-, 24" 22/-, 18" 20/-. Goods returnable if not satisfied. Terms: C.W.O. Prices include delivery by Passenger Train. Horne, Moss Street, Rochdale.

## Foods

**EUGLENA** cultures, 2s. 6d. post paid. Pearson, 183, Broken Cross, Macclesfield, Cheshire.

**WHITE WORMS.** Extra large cultures, 2/6 and 5/-. Full instructions. Elliott, 54, Oak Road, Catshill, Bromsgrove.

**VERY** large cultures of Whiteworm, 2/6. Try me and see; and Microworm, 2/6. Post free. J. Callard, 21 Western Rd., Plaistow, London, E.13.

**ESSENTIAL** Foods, generous cultures White-worm and Microworm, 2/- each or two for 3/6, with full instructions; Specially blended, dried food of high calorific value with easily digested vitamin protein and mineral content, 1/3 carton; Phosphatic plant food and fish tonic to perk up the appearance of your tank, 1/- carton, sufficient for 24" tank for six months. Burrows, 68 Cherrytree Avenue, Delves, Walsall.

**MICRO** Worms. This splendid livefood is second to none for raising healthy fry, even small adult tropicals benefit immensely by its use. A good starter culture will produce literally millions of worms and can be used within seven days of purchase. All orders received before Friday are dispatched the same week. Cultures with full instructions 2/6 and 4/6. The 4/6 size may be used within two or three days. A. Joel, Malvern, Victoria Avenue, Laidon, Basildon, Essex.

## Fish

**FOR** your garden pool, large Goldfish, Shubunkins, Golden Orfe, Water Lilies and Spawning Weeds. Trout Fisheries, Great Stambidge, Essex.

**NEONS**, home-bred 5/-. Glowlights 4/6, Tigers 2/3, Clouds 2/6, Scissors 2/6; Can, carriage 2/6. Naylor, 44, Durlay Dean Road, Selly Oak, Birmingham.

**GOOD** quality tropical fish, bred from show winners, seen any time. Plants, worm cultures. Hemming, Fladbury, near Pershore, Worcs. Phone: Cropthorne 324.

**PRIZE-STRAIN** Blue Scarftail and Blue American Flagtail Guppies 15/- per pair; Satisfaction guaranteed. Carriage, telegram, 3/6. A.T.A. Member. C. R. Perry, 615 West Street, Crewe.

**A NEW** Variety of Golden Guppies! Transparent gems with red, green and silver markings. 10/- pair. With three pairs—can, carriage and telegram free. Live delivery. Healthy, vigorous fishes. Burgoyne, Longhill Avenue, Ayr.

## Fish—continued

**YOUNG** Shubunkins for sale from Mid-June, from prize-winning parents, 30/- doz. Selected, £2 doz. Can, carriage inclusive: A. Huson, 23, Reepham Road, Norwich.

## Plants

**WATER** Snails, one dozen and bundle weed. 2/3 L. M. Allen, 143, Fitzwilliam St., Sheffield, 1.

**FIRST-CLASS** Aquaria Plants. 1st and 2nd awards B.A.F., 1953. Assorted Selections, 5/6, 7/6, 10/6; Tropical or Cold. Sagittaria natans, Hygrophila, Myriophyllum, 6d.; Indian Fern, Riccia, 1/-; Spatterdocks, Aponogonets, 3/- each; Cryptocoryne cordata, 1/6 to 3/6; Beckettii, 1/6. A.T.A. Member. C. R. Perry, 615 West Street, Crewe.

**PLANTS**—Summer prices and quality: Tropical—Ambulia, Hornwort, S. natans, S. subulata, S. microfolia, V. torta, V. spiralis, Hygrophila, Ludwigia, Heteranthera, 5d. each, 4/6 doz.; Herpestes, Indian Fern, 9d.; Nymphaea stellata, 2/-; Giant Sagittaria, 1/3; Water Hyacinth 2/6; Cryptocoryne cordata 2/6, Willisia 2/3, Neovillia, Beckettii 1/9 each; Riccia, Duckweed 9d. cubic inch. Coldwater—Flodea densa, crispa, canadensis, Potamogeton, 4d. each, 3/6 doz.; Water Hyacinth 2/6; Post and packing 6d. under £1. Trade Supplied. Over 60 varieties of Tropical and Coldwater fish stocked for personal shoppers only. The Kingfisheries, 505 Croydon Road, Beckenham, Kent. Bec. 0909.

## Reptiles

**SNAKES:** Leopard, Four-lined, Vine, Dark Green; Pythons: Anacondas; Boas, etc. Alan Robertson. See below.

**LIZARDS:** Various Skinks, Geckos, Iguanas, Tegus, Legumes, Chameleons, Anolis, etc. Alan Robertson. See below.

**AMPHIBIANS:** Tree and Water Frogs from Europe and South America, also various Toads, Salamanders, etc. Alan Robertson. See below.

**TORTOISES:** Testudo hermanni and graeca, also Testudo tabulata. Full lists and details from Alan Robertson, Morison House, South Learmonth Gardens, Edinburgh, 4.

"**SNAKES** of the World," by Dimiters. "Handbook of Frogs and Toads," by Wright, and many other American and British books for the enthusiast available from Alan Robertson, Morison House, South Learmonth Gardens, Edinburgh, 4.

**FOREIGN** Reptiles and Snakes, etc., wanted. Only perfect specimens accepted. Please send full details to Alan Robertson, Morison House, South Learmonth Gardens, Edinburgh, 4.

## Shows

**THE** Bristol Aquarists' Society are holding their 1953 Open Show and Exhibition at the Y.M.C.A. Concert Hall, Trenchard Street, Bristol, on 2nd and 3rd October. Judges: Coldwater—B. Meadows, C. J. Saunders; Tropical—Mrs. W. M. Meadows. Schedules available from R. Woodbine, 18, Grantham Road, Kingswood, Bristol.

**BOOK** the Date! The next National Exhibition of Cage Birds and Aquaria takes place at the National Hall, Olympia, on January 7-8-9, 1954. Further details will be announced of the aquaria section organised by WATER LIFE in the next issue. Ensure that your club enters the Interclub Furnished Aquaria classes. Cash prizes offered.

## Business for Sale

**AQUARIA** and Pet Shop. Lock-up, Lease. Good stock and fittings. S.W. London. Genuine reason for sale. Price, all at £500.—Box 912 WATER LIFE.

Continued next page

**Books**

"EXOTIC Aquarium Fishes"; "Goldfish Varieties"; "Aquarium Highlights"; "Modern Aquarium". These latest editions of Innes books from stock or direct from Innes to you at lowest prices. Subscriptions to Innes "Aquarium Magazine" arranged. "National Geographic", "Photography" and all other American magazines and books obtained. Stamp for lists. Herga Ltd. (W.L.), 7, Havelock Road, Hastings, Sussex.

AMERICAN Magazines. One year subscriptions:—"Aquarium" (Innes) 21/6, "Aquarium Journal" (San Francisco Society) 21/6, "Aquatic Life" 16/-. "Tropical Fish Hobbyist" 10/6. "L'Aquarium Exotique" (Canadian—in French) 21/6. Specimens 3/- each. Books by Innes:—"Exotic Aquarium Fishes" (latest edition—16th) 56/-. "Aquarium Highlights" 45/-. "Goldfish Varieties" 45/-. Detailed list free. Hobson, 79, Southbrook Road, Exeter.

FOR full details of "Water Life" Series Booklets, see page 231 of this issue.

**PUBLIC NOTICE**

THE Lambeth Aquarist Society's committee announce that neither they, nor the Society, will be responsible for any transactions, financial, business, or social, placed on behalf of the L.A.S. by any person or persons other than the Secretary, as from the appearance of this notice.

Traders please note, no order will be official unless signed by the Secretary and counter-signed by the Chairman and Treasurer.

**Miscellaneous**

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When you are in HOLLAND from September 26th to October 4th, do pay a visit to the great exhibition of the Union of Aquarium Societies in Rotterdam and district at the Rotterdam Diergaard (Zoo).

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