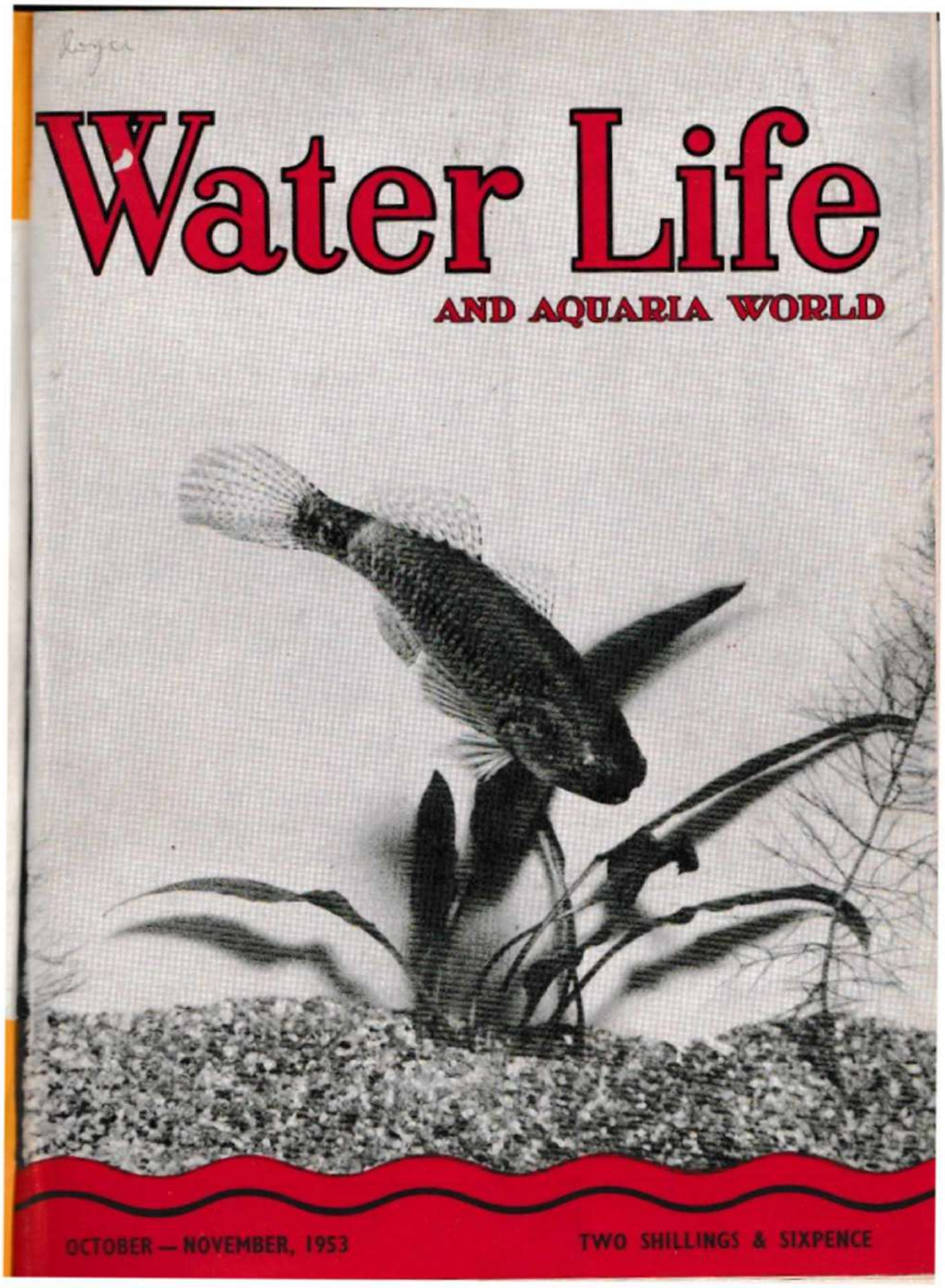
Water Life

AND AQUARIA WORLD



OCTOBER — NOVEMBER, 1953

TWO SHILLINGS & SIXPENCE

Water Life AND AQUARIA WORLD

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FRONT COVER: **SPOTTED SLEEPER.**

This popular name for *Dormitator maculatus* has been given on account of its habit of remaining motionless in unusual postures for long periods. The species is more active at night. In Nature it grows to some 10 in. but under aquarium conditions 6 in. is a good length. When mature it tends to be troublesome but small specimens are peaceful.

Photograph] *[L. E. Perkins*

EDITORIAL

Higher Status

EXHIBITIONS of fish have been largely responsible for keeping up interest in our hobby. The spirit of rivalry evoked has led many to breed more fish in the hope of producing prizewinning specimens. Show standards have helped to control breeders' aims, to give judges the yardstick by which to work and to assist laymen in understanding the achievements of those whose fish gain the premier awards.

Some exhibitors have proved themselves capable of securing the leading prizes time after time, although it must be conceded that their supremacy is being challenged every so often by newcomers who stage fishes that merit the attention of the judges.

The same names appear as prizewinners over and over again. Unrecorded are those who, whilst persistent exhibitors, have been unsuccessful. They need some encouragement as do those who have been deterred from exhibiting because they would stand little chance.

If this feeling of inferiority spreads, it may result, in time, in diminishing entries for our shows and may even cause some to drop out of an important section of our hobby.

Two Grades

A solution is available. It has been used to advantage in other livestock hobbies and could, some fishkeepers contend, be adopted to our requirements. It is the introduction of a second category of exhibitor. Let there be champion and novice grades with classes for each at our open shows.

The grading could be made with little trouble, a champion being one who has won three first prizes in novice classes put on at recognised open shows.

As a start, it would be necessary to fix a date a year or more ahead when the full scheme would be put into operation and, in the interim, the champion classes would only be for those who have won at least one first prize at an open show. Subsequently, the select championship grade would be added to when other exhibitors gain their third red ticket.

There are pros and cons. Show promoters would have to enlarge their classification to include sections for both novices as well as champions. The advantages are that the champion classes would attract the best exhibits and, as the number of champions grew, so would the keenness of the competition increase. The novice section would give encouragement to all who fancy their chances in the exhibition world, would offer due reward to those who quickly deserve a prize and yet would upgrade the most successful novices to make way each year for others.

A few individual societies have tried in different ways to help beginners by putting on classes under varying restrictions, but it would appear that the time is coming when the status of exhibitors should be considered on a national basis. The Federation of British Aquatic Societies might give a lead.

Assuming the introduction of more than one class of exhibitor to be desirable, it were better if, at the onset, a clear lead were given by a representative organisation.

Current Research

Jumping Behaviour of a Marine Goby

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

IN the previous two contributions of this series we have dealt with studies on the breeding behaviour of the Stickleback. There are at the present time many workers devoting their attention to various aspects of fish behaviour and Lester R. Aronson has recently published his observations on the Gill-finned Goby (*Bathygobius soporator*). From these it would appear that this species is capable of remarkable feats of memory in its daily life. His investigations (published in No. 1486, p. 22, of the *American Museum Novitates*) were carried out at the Lerner Marine Laboratory, Bimini, B.W.I. They followed the reports of local observers that this tide-pool-dwelling species possessed the remarkable ability to leap effectively from one pool to another when, on account of the high sloping rims of the pools, it was not possible for the fish to see the second pool at the onset of the leap. So far as could be determined, the leaps always started with the fish resting on the substratum of the pool. The fish faced in the direction of the pool towards which they were about to jump—but which they could not see—and assumed a characteristic pose with the body curved to one side. Then, with a sudden snap, they would shoot through the surface of the water and through the air into the adjacent pool. The flight was not made unless the water were actively agitated, or unless the fish were actively pursued or prodded by the observer. Even then they did not jump if they were able to swim into a crevice of sufficient size to afford protection. The actual jumps ranged from about 5 to 40 cms., i.e. from about 2 to 16 in. and the Gobies themselves were about 3 cms. in length.

From a careful series of individual observations on 18 different fish it was clear that there was no simple explanation of the way in which a fish could orientate itself successfully in order to land safely in the adjacent pool. In a few instances the jumps took place through notches in the rocky rims of the pools, but other jumps were over high points that were free from notches or similar configurations. Moreover, jumps took place in all directions and in some cases two or more fish, under simultaneous observation in the same pool, took quite different routes. While many of the jumps were downward, and led towards the sea, others were upward, away from the open water, and carried the fish to either smaller or larger pools. Thus the position of the sun, or shadows cast by the sun, did not appear to be of significance, and some of the jumps were observed on overcast days. It was thought unlikely that the individual fish could have known of the correct direction in which to jump through previous "trial and error" attempts. Although fish struck the rocks on a few occasions serious errors were not observed and indeed they might well have proved fatal in view of the fact that for many hours on most days the rocks surrounding the pools were hot and dry.

Aronson has therefore been forced to the conclusion that the individual Gobies can only have "learned" the direction in which to jump through prior knowledge of the topography of the rocks and pools. There is a marked tendency for the fish to return each day to the same "home pool" and it is suggested that as they swim over at high tide they are able to acquire an effective memory of the general features of the limited area in which their "home pool" is situated. This knowledge they are able to utilise when locked in their pools at low tide.

Anæmia in Trout

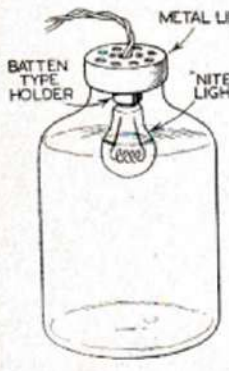
The writer is at present investigating a form of unthriftiness in trout that appears to be of nutritional origin and is characterised by an anæmic appearance and by fatty change in the liver. So far the studies have been confined to dead specimens but, with the onset of cooler weather, it is hoped to be able to extend the observations to living fish and to endeavour to evaluate the action of various nutritional supplements. To date one finding of interest is the wide variation in liver vitamin A reserves to be found at the same time of the year, not only among hatchery specimens but also among wild river trout. In due course the results will be reported in these columns.

The nutritional requirements of the trout first received serious scientific attention nearly thirty years ago, when C. M. McCay and his colleagues endeavoured to raise young trout with the aid of purified diets. They reported as long ago as 1927 (McCay, C. M., & Dilley, W. E., "Factor H in the nutrition of trout", *Transactions of the American Fisheries Society*, 57, pp. 250-260) that the species required for growth some substance present in fresh meat but not in dried or cooked meats. This substance, which they termed factor H, was shown to be different from any of the vitamins known at that time, and there is no evidence that its chemical nature has yet been determined. Among carnivorous mammals, such as the fox and mink, it is difficult to secure optimal growth, development and reproduction in the absence of a proportion of fresh animal tissues in the diet.

Readers' Hints and Tips

Small Emergency Tank

FIRST obtain a one-gallon jar with lid (cafes and hotels usually have pickles, etc., in this type of jar). Next a batten-type bulb holder is required and, finally, a low-consumption "Nite Lite" (priced 1/8 at multiple stores) and some flex. Leave the waterproof covering in the lid of the jar and in the metal top drill about 8-10 holes, ¼–⅜ in. diameter. Also make a hole in the centre to take the wires of the holder. If there is no waterproof inner cover to the lid cut one from rubber and fit it in. Then fix the batten holder into the lid with screws and nuts, pass wires through the centre hole in the lid and connect them to the holder. The "Nite Lite" is approximately 5 watts and will raise the temperature of the water in the jar 10-15 deg. F. if left on continuously, i.e., at a room temperature of approximately 60 deg. the water can be kept fairly steadily at 75 deg. if the bulb is submerged for three-quarters of its depth. Care must be taken to see that water does *not* touch the contacts of the holder. Other size bulbs may be used—a 15 watt one, for instance—and experiments will show what temperatures will be obtained. The reason for having a waterproof inner lid is that condensation does not then rust the lid or seep into the batten holder. The holes in the lid allow for escape of gases and renewal of oxygen; quite a lot of air is left between water and lid. This jar may be used for quarantining new fish or as a hospital jar for sick ones.—J. R. Brooks, London, S.W.1.



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

Annual Fishes of Two Continents

Unrivalled in their Striking Colouring and Interesting Breeding Procedure

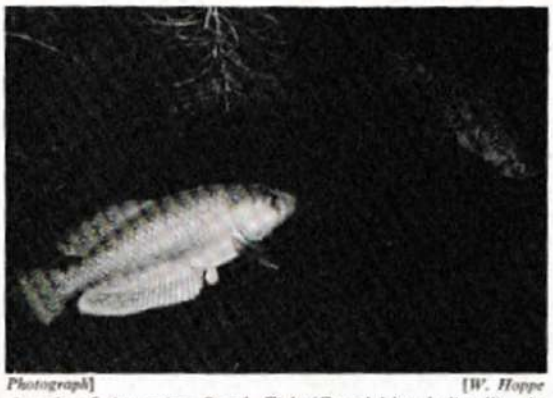
By Dr. Werner Ladiges

IN a special issue of the "*Aquarium Journal*" (July 1952) Dr. George S. Myers published a comprehensive article about "Annual Fishes". With this term the author designates fish which, on account of the seasonal changes of their habitats, have a life-span of less than a year and sometimes even of only a few months. In the opening paragraph the author states: "Annual fishes? Fishes that live only one year? Why should an aquarist be interested in such creatures? Simply because some of them are probably the most gorgeously-coloured of all freshwater fishes. Gardeners cultivate many plants which flower beautifully but briefly. Is the aquarist less ambitious and patient?"

In the introductory passages of his essay Dr. Myers calls attention to a rather large number of lesser known types, mostly marine species, which are presumed to live only one year or less. It is of particular interest in this connection that, according to observations made on the spot (Myers and Harry, 1948), the majority of adult specimens of the *Apistogramma* species disappear suddenly without leaving any traces whatever—probably dying a natural death shortly after spawning and caring for their young. This is contrary to what has been reported of specimens kept in captivity. Many a failure may have been due to this, as in the case of *Apistogramma ramirezi*.

It is quite remarkable that practically all zoological and even ecological manuals fail to mention the peculiar fact that there are fish in countries with well defined dry and rainy seasons which live in small bodies of water such as ditches, mud holes, ponds and watering places, and which survive the dry periods by producing eggs that are deeply buried in the mud. As soon as sufficient water has accumulated after the commencement of the next rainy season the eggs develop into beautiful fish whose life-span ends shortly after the spawning period, when the torrid rays of the sun cause all water to evaporate.

Aquarists have been familiar with these fish species for more than 50 years. It is to the fishkeepers' credit that it was through them that the special habits of these fish were brought to the attention of ichthyologists the world over.



Photograph [*W. Hoppe*

A pair of Argentine Pearl Fish (Cynolebias bellottii), *the more colourful male is to the right. Length is approx.* 3 *in.*

Egglaying Tooth-carps

All fish dealt with in this article belong to the Egglaying Tooth-carps (*Cyprinodontidae*) and more specifically to the species grouped together by Myers under the designation "Rivulini"; more recently a new term has been used, "Aplocheilini". All known species of annual fish live either in South America or in Africa. The first specimen was imported into Germany in 1906, a *Cynolebias bellottii*. The unique beauty of this fish, which is commonly designated as Argentine Pearl Fish, is generally known, especially the silky blue of the male, so liberally sprinkled with countless pearl-like irridescent spots. Simultaneously the first details of their living habits became known; they are found in small-size seasonal water bodies in the Pampas. However only in 1933 were the first reports and illustrations made available by Thomas in a German publication. His data is embodied in my book "Der Fisch in der Landschaft" (The Fish as a Function of its Habitat).

The unusual skill displayed by the first aquarists still deserves our unstinted admiration as they succeeded in breeding them in spite of the extremely scanty information at their disposal. Their observations resulted in the following details coming to hand. The eggs are deposited in the mud which is protected from drying out completely by a hard crust forming on the surface. They are capable of withstanding the high temperatures caused by the rays of the sun. Irrespective of the length of the dry period (it differs greatly in the various parts of the South-American continent) the eggs start hatching only after sufficient water has accumulated to soften the hard crust of the mud holes. Within a short time the young fry grow up and mature, probably feeding on the many immature forms of the mosquitoes hatching at the same time. During the spawning time, which may extend over a long period of time, the eggs are buried in the mud. The parent fish subsequently die from exhaustion or because of the drought. No fish survives in the mud. Many questions have remained unsolved so far in this connection.

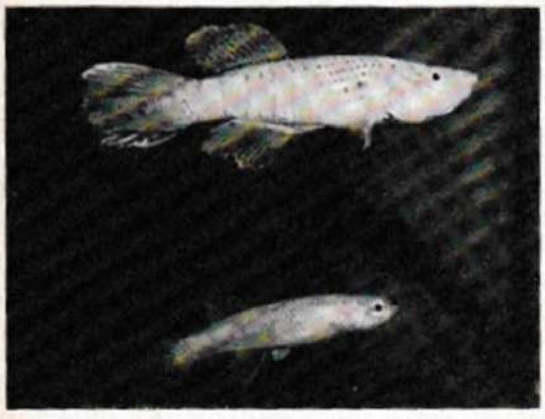
According to observations made in aquaria it seems that the eggs must pass through a dry period even if it is only a short one. If that is actually the case it would mean that only one generation could live in a given water hole during a rainy season. This problem requires systematic and exact study to establish the following points:—

1. How long can a *Cynolebias* fish live? Does the lifespan vary with different species?
2. How quickly do the fish reach maturity? Does this length of time depend on prevailing temperature?
3. Over what length of time does the spawning period extend? How many eggs are deposited within one period?
4. What factors exert an influence on the maturation time of the eggs? Is a dry period absolutely necessary? What influence do different temperatures have on the time required for maturation? What is the minimum time required for maturation? Do chemical factors exert an influence in this connection, e.g. salt or saltpetre (potassium nitrate) content?
5. How long do the eggs retain their vitality? Are they capable of surviving more than a single drying period whilst embedded in the mud?

The name of Alfred Adloff, who used to live at Porto Alegre in Southern Brazil, is closely associated with the early research work done on these fish. After about three or four species had been described as occurring in Argentina, Adloff sent the first specimens to Hamburg in 1920 which he had found among native fishes near his home. Among them

there was a slightly deviating type of unusual slimness which Regan classified in a group by itself. It was *Cynopœcilus melanotænia*. Recently, however, Myers recombined it with the species *Cynolebias*. In 1934 Dr. Ahl came out unexpectedly with the first description of a species *Cynolebias schreitmülleri* found near Rio de Janeiro, which has not been found again up to the present time.

During the same year Hamburg Aquarium made available to me a single male and several female specimens belonging no doubt to the *Cynopœcilus* Genus; they were said to have been found at the same spot. The poor condition of the fish when I received them did not allow more than a short description and a cursory sketch. In spite of further efforts no more specimens of this species could be located and it looked as if it were lost altogether. Then, in 1942, an American officer, Major Thomas D. White, who had become interested in this matter, reported that he had found three species jointly with Mr. H. Griem, Rio, in the immediate neighbourhood of that city. Among the fish observed by them there was the species described by me, *Cynopœcilus marmoratus*, so my description was now officially justified. The fishes were thereupon recognized as *Cynolebias marmoratus*. As this particular fish is undoubtedly the most beautiful among all types found so far I want to repeat the complete and original description of the first specimen. "With its cylindrical longitudinal shape the fish shows a great similarity to the species of *Rivulus*. The male of the species is particularly remarkable on account of its beautiful colours. The back of the male is light brown. Two dark wine-red lateral stripes, sometimes interrupted, reaching from gill covers to the base of the tail. The space between



the stripes is bright yellow. Dark red slanting stripes on yellow gill covers. Lower lips and surroundings of eyes dark red. All fins, except the pectorals, are light brown. Dorsal fin with pale red markings; part of the fin is very long, the rays of the front part ending in red dots. Anal black-edged, not so long. Caudal leaf-shaped with dog-toothed edge, upper half with red dotted lines radiating from base, lower half pure white with black border. Two inches. Female plain brown with round fins, slightly smaller."

Further Species Discovered

Later on further discoveries were reported by Myers and Cervalho from Southern Brazil, and even from the State of Ceara, near the Amazon lowlands. In 1932 the *Austrofundulus transilis* Myers was described for the first time. Only one specimen had been found in the State of Guarico, Venezuela. In 1942 more specimens were found. Dr. Schultz brought still another type to Germany when returning from Venezuela. To judge from their habitats, these fish must also be regarded as annual fish.

To my great surprise Dr. Myers does not list the magnificently-coloured *Pterolebias* species in his survey, although all observations made so far by Roloff, Grelck and others with *Pterolebias longipinnis*—first imported into Germany in large numbers in 1949—lead to the conclusion that it is an ecologically-related type.

The African continent plays a role for it is from there that we get another set of beautifully-coloured short-lived fishes, e.g. the species *Nothobranchius* and *Aphyosemion*. Whilst all *Nothobranchius* types must be regarded as doubtlessly belonging to this group there exist some differences in the various *Aphyosemion* types. Dr. Myers would like to classify *Aphyosemion cæruleum* and *Aphyosemion arnoldi* as "annual fishes". It must be assumed, however, that the eggs of quite a number of other species are capable of surviving drought periods.

Importations by Air

All problems relating to these fish have become highly interesting to aquarists as, towards the end of last year, large numbers of the various kinds of *Cynolebias* were imported into Europe. By air express a certain number of

Photographs] [*W. Hoppe*

Left: A pair of Blue Gularis (Aphyosemion cœrulem). *Male is the upper fish. Size is* 4-5 *in. Above:* Pterolebias longipinnis *pair. Male is to the left. Length is up to* 3 *in.*

Cynolebias bellottii and also *Cynolebias nigripinnis* were brought to Hamburg. Attempts at breeding both species met with full success. In particular, it was found that it was comparatively easy even for aquarists with only a few tanks to breed the small *Cynolebias nigripinnis* which had been unknown up to then. The male reaches a total length, in exceptional cases, of 1½ in., while the female never grows bigger than 1¼ in.

Colouring of Both Sexes

The males of this species are especially attractive on account of their really splendid appearance. Innumerable pearl-like spots, arranged in transverse stripes on a velvety blue, nearly black, background reflect their iridescent light. The gill covers are of a bright light blue colour, the same as the border rim of the dorsal fin. The females show a dark marble-like design on a dark yellow-brown background so that one could mistake them for females of the species *Elassoma evergladei*. This very beautiful, if rather small, fish cannot only be kept in water of any type but it is also very prolific. If my observations prove true they live much longer in captivity than the equally-beautiful *Cynolebias bellottii*.

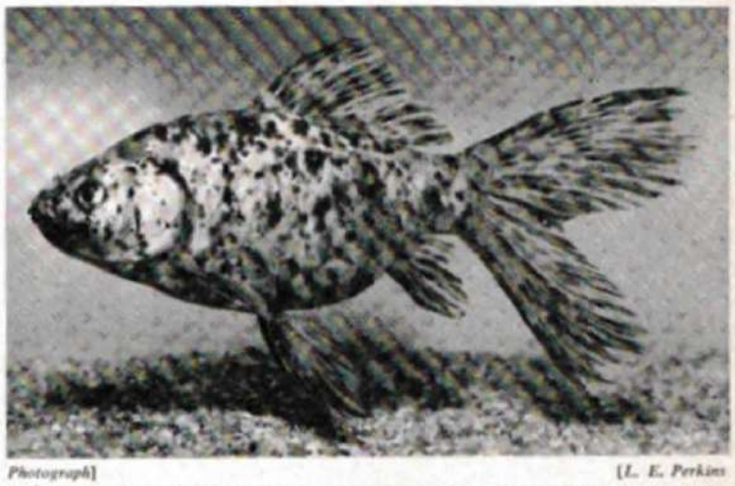
Both species are now stocked by European aquarists' suppliers, thus offering a welcome opportunity for aquarists to add their share of knowledge to the solving of the biological points of the "Annual Fish" still shrouded in mystery.

Notes for Novices (11)

Stocking a Garden Pool with Fish

IF brilliant colouring is the criterion when stocking a pond with fish—and there is a perfectly good reason why it should be—it is not necessary to go to endless trouble and expense trying to obtain less readily-available species. Why brightly-coloured fish are desirable in a pond is that, viewed from above, they always offer contrast to the plants whilst silvery or greenish fish generally have olive or olive-brown backs which, seen from above, are none too interesting.

Pride of place for pond occupants must go to the more hardy and less bizarre varieties of Goldfish. They are usually in good supply and include the Common Goldfish, the Comet, the Scaled Fantail and, for a touch of delicate colour, the Shubunkin. Avoid, without exception, Telescopic-eyed types, Veiltails, Orandas and Lionheads for all-the-year-round pond residence. There are a few native and foreign coldwater fish which are also interesting but we will deal with Goldfish first.



Photograph] [L. E. Perkins

The multi-coloured Shubunkin, a favourite fish for modestly-sized ponds.

The Common Goldfish is too well-known to require description but it might be as well to point out that it is not only found in red-orange colouring. Some fish of this variety are off-white or yellow whilst others may have black and white markings on their basic body and fin colour. The Common Goldfish is hardy and inoffensive and under good conditions in a large pond will grow up to a foot long.

Characteristics of the Comet Variety

The Comet Goldfish is available in approximately the same colourings as those of the Common. Its outstanding feature is a lengthy, deeply-forked caudal fin. In comparison the body is quite small and slim. It is a fish of great activity, and like others possessing this characteristic, it reacts unfavourably to overcrowding. Given plenty of room, there are few finer fish.

The Scaled Fantail (which is the fancier's way of saying a Fantail with the body colouring of Common Goldfish rather than that of the Shubunkin) has a rounded body and short, divided caudal fin. A strain which has been acclimatised to pond conditions will winter outdoors but the fish is naturally slower in movement than, say, the Comet, so it is best not to mix the variety with such fast-swimming types. Calico Fantails (similar in colour to the Shubunkin) are generally less hardy and will not usually weather a winter in the pond.

The colouring of the Shubunkin is a pastel mixture of blue, black, mauve, red, brown and yellow. Not every specimen shows all these colours, but blue is particularly favoured. The reason why the fish is termed "scaleless" is that the amount of reflecting tissue present is less than in the so-called "scaled" types of fish. This gives a non-shiny effect. A more apt description is "calico" or "harlequin". Shubunkins are available in two varieties, London and Bristol. The former has body and fin shape comparable to the Common Goldfish whilst the latter has a larger caudal fin and slightly higher dorsal.

Importations of Goldfish frequently come into this country from the Continent. Most of the fish arriving in this way are Common Goldfish from Italy. It will be appreciated that such fish have been used to higher temperatures than they are likely to experience at any time here, except during the summer months. For this reason it is important that foreign stock is introduced to the pond early in the summer so that it has ample time to become acclimatised and also to build up food reserves for tiding it through the winter. In this way losses will be kept down to a minimum.

Photograph] [L. E. Perkins

A well-shaped Common Goldfish which has yet to change colour.

The alternative procedure is to purchase home-bred stock —year-old fish seem preferable—and, generally speaking, the initial extra cost will be more than justified. It is important to ensure that, if the fish have been kept in aquariums, they have not been subjected to artificially-high water temperatures except in the first few weeks of their lives. Fish which have become used

to heated water throughout the year will not take kindly to year-round life in a pond.

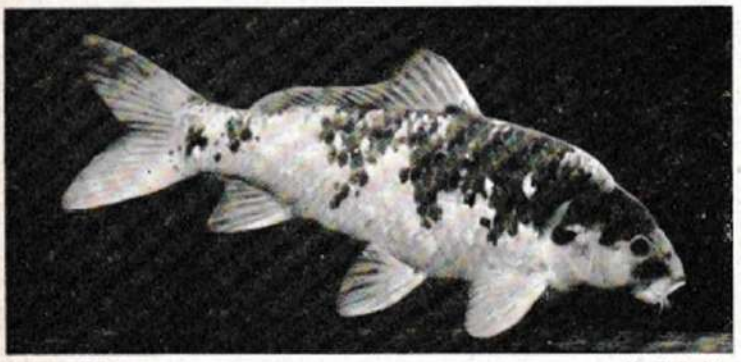
Although we have recommended year-old fish when a wide choice is available, fish of any size—provided they are not excessively old and large—will soon settle down. Very young fish will suffer if they are mixed with adult specimens so try to ensure that all the fish are of comparable size. In any case it is decidedly risky to attempt to bring fish less than two inches long through the winter.

With the "scaled" type of fish, as described for Common Goldfish, Comets and Fantails, the bright colouring does not show itself from birth. The fish will have to be at least four months old before they change their dull olive-brown colour for the more colourful adult hues. It may be much longer before the colour change takes place and some fish never alter. Fish which are obviously a few years old and have not changed colour should not be purchased. Apart from the obvious reason that they are less colourful they will also pass on the undesirable late or non-change of colour to their offspring, should they breed.

The Sprightly Orfe

Among other fish eminently suited to pond life is the Golden Orfe (*Idus idus*), streamlined in shape and lively in movement. It is largely a surface feeder—and therefore swims in the upper stretches of water. Its activity gives a correct indication that it is a fish which requires plenty of room with no suggestion of overcrowding. The colouring is a light gold but a silver variety of *I. idus* is sometimes available.

The Rudd (*Scardinius erythrophthalmus*) is a desirable native species. The colouring is greenish-brown on the back, paling to silver on the underparts. The eyes and fins are reddish. Even more attractive is the Golden variety which has burnished gold body colour, paling a little ventrally. The fins and eyes are reddish. A fish of somewhat similar appearance, the Roach (*Rutilus rutilus*), does not do too well in a pond, particularly the average-sized garden one. The reason is that it is primarily an inhabitant of slow-moving rivers and large lakes and does not seem to like small pools where it is particularly susceptible to attacks of Fungus.



Photograph] [*L. E. Perkins*

Hi-goi Carp, a hardy type of pond fish. Note the presence of barbels.

Both types of Tench (*Tinca tinca*), the Green and Golden, live well in ponds but they are primarily bottom-feeders and are only likely to be seen in the evening when they do sometimes come nearer the surface. The scales of this fish appear small and in the Green Tench the colour is olive-green whilst in the Golden variety it is orange-yellow, sometimes with dark blotches, particularly on the back.

An eminently suitable fish for ponds is the Hi-goi Carp (*Cyprinus carpio* var. *auratus*). It could be casually mistaken for a Goldfish but identification is quite easy as the Hi-goi has two pairs of barbels whilst the Goldfish has none. Colours may be golden-red, yellow, silver or steel-blue, sometimes with dark markings.

Several other types of Carp do well in ponds but they are not over-colourful. Large specimens are also slow of movement. The Common Carp (*Cyprinus carpio*) is quite deep in body and the colour is an olive-brown. Leather Carp, a variety of the Common, are similarly shaped but the scales are few in number and very large. The Mirror Carp is extremely like the Leather but has large reflecting scales, few in number, which run in rows along the sides in the region of the lateral line. The Crucian Carp (*Carassius carassius*) is deeper bodied and lacks barbels, but in other respects it is similar to the Common Carp.

It is important that all fish should be quarantined for about a fortnight before introduction to the pond. This is to allow any latent disease or parasites to show themselves. Quarantining is particularly necessary for newly-imported stock and for fish taken from wild ponds, although the latter are not recommended for garden pools as a general practice.

During the fishes' sojourn in their quarantine quarters (a large bath is suitable) they should be subjected to three or four disinfecting baths. These can either be prepared by mixing 2½-3 ounces of salt to a gallon of water, allowing the fish to remain in the solution for about an hour on each occasion, or by using potassium permanganate. In both cases the substances must be well dissolved before the fish are introduced but this is particularly important for potassium permanganate. The best way is to make up a stock solution consisting of 15 grains of potassium permanganate to a 100 cu. cms. of water. Then 4½ cu. cms. of this solution is added to a gallon of water and the fish introduced for up to half-an-hour. If they show distress remove them immediately and use a less concentrated solution.

When selecting fish go for those which swim vigorously with fins erect. Pass over any with drooping or bloodshot fins or which show difficulty in rising from the bottom of the aquarium—usually a sign of swim-bladder trouble. There should be no white spots on the fins or body except in mature males where gill-covers and pectoral fins often have white pimples, called sex tubercles. Their presence is quite normal.

The number of fish for a pond cannot really be gauged from the old-fashioned formula of 1 in. of fish to one gallon of water. In a pond having average overall dimensions of 6ft. × 5ft. × 1ft. 6in. for instance, one would, working to this formula, be able to accommodate about 90, 3 in. fish. In reality 25 such fish would be a lot happier in such a pond and there would then be a generous allowance for growth.

With regard to feeding, provided the pond is not overstocked, the fish will find many naturally-occurring livefoods during the Summer months, e.g., Mosquito larvæ, Bloodworms and Glass-worms. They will no doubt only require feeding about two or three times a week at this time. Chopped Earthworms are a most nourishing addition to the diet and these, with occasional feeds of prepared foods, *Daphnia* and *Tubifex* are ideal.

In cold weather two feeds per week are all that is required as the fish are in a less active state. In really cold spells do not feed at all as the fish will be entirely inactive. During late Autumn give the stock as much nourishing food as they will eat and this will then ensure that they have plenty of food reserves on which to draw in the Winter months. Following the Winter, during which little food is taken, the fish may be in poor condition and might even show a touch of Fungus. Several weeks of generous feeding with chopped Earthworm will usually clear up the trouble completely.

New Cure for Fin Rot

Phenoxetols as Treatment for Bacterial Fish Diseases

By Ian M. Rankin

AQUARISTS often bemoan the fact that Penicillin is not available for treating the bacterial diseases of fish without realising that it is of doubtful use in this particular field. Penicillin has definite limitations, as have all the drugs in the pharmacopœia, and it is wrong to regard it as a cure-all. The bacterial diseases of fish are usually caused by gram-negative* bacteria. Penicillin's main use is with those diseases which arise from gram-positive organisms and, while it is true to say that fish suffer from infection by these organisms, cases are relatively rare and usually due to radical causes.

Identification of bacteria types is admittedly difficult, and may only be achieved by those who possess the necessary experience and specialised equipment. Fortunately the symptoms of bacterial disease are usually clear and obvious and, as there is a very good chance that a particular disease is due to gram-negative organisms, treatment may be carried out with materials that will combat these. Experience and research in the medical field shows that a certain group of drugs is very active against Penicillin-resistant gram-negative organisms of a similar kind to those associated with many fish diseases. This is Phenoxetol, and related compounds. There are three different compounds in this group:—

PHENOXETOL (Phenoxetol B.P.C.). "The anti-pyocyanea compound". Medically this material is used, for instance, in conjunction with Penicillin for the treatment of mixed infections of wounds and ulcers. From the aquarist's point of view it is most useful as a curative for White Fungus and Fin Rot. It appears to have a bracing effect on fish.

PROPYLENE PHENOXETOL. "The active agent against gram-negative bacteria". This material has stronger activity than Phenoxetol against certain bacteria, but has a rather depressing effect on the fish.

PARA-CHLORO PHENOXETOL. "The anti-fungus agent". This is the most effective of the three Phenoxetols in many respects. It is found to be effective against *Ichthyophonus hoferi* in vitro, but its action in cases of fish suffering from *Ichthyophonus* disease is not yet known.

Fin Rot is a serious disease, typified by the slow rotting of one or more of the fins. A slight "milkiness" in the caudal fin is usually the first sign of trouble and is followed by the appearance of blood spots and putrefaction of the fin. The condition is generally associated with fish who are in low health. Protracted low temperature, dirty living conditions, gas embolism, damage and weakness caused by other disease, may be predisposing causes. In Veiltail stock, even if a cure is effected, it may cause permanent malformation of the all-important caudal fin. Although not normally an infectious condition the disease may attain epidemic proportions in the tropical tank sometimes attacking the members of one particular species. Black Mollies appear very susceptible to contamination of this kind, and have been known to die within 24 hours of their inclusion in a tank where Platies were suffering from Fin Rot.

The causative organism of Fin Rot is not yet identified, but it is reasonably certain that bacteria are connected with the condition, either as cause or carriers. Research is made difficult because there are many commensal or "friendly" bacteria on and around fish—thus cultures made from diseased sections may contain many different types and variants of micro-organisms. It involves a considerable amount of work to sort out the bacteria in a large number of cultures to find which organism occurs uniformly throughout and will produce disease under experimental conditions.

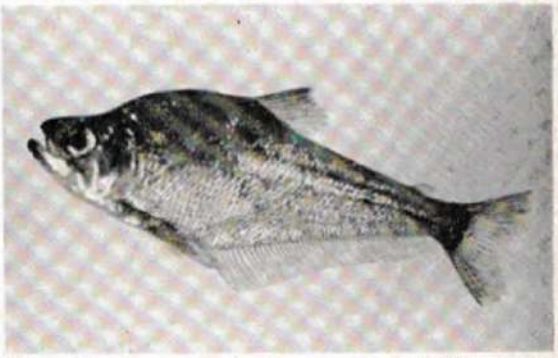
Cultures from Fin Rot sections have revealed motile, gram-negative organisms which are easily destroyed by the Phenoxetols. An extract from my casebook will illustrate this:—

Fin Rot, Case 2: Goldfish, caudal fin almost completely lost. Successfully treated in tank with Phenoxetol. Initial culture on blood agar.

Result of test on culture two, carried out by Dr Erich Boehm, F.R.I.C. The organisms were killed by

1.25% Phenoxetol	within 5 minutes
0.75% Propylene Phenoxetol	within 5 minutes
0.30% Para-Chloro Phenoxetol	within 5 minutes
0.75% Phenol (Carbolic)	after 2 hours.

The test shows that Para-Chloro Phenoxetol was the most effective agent against these organisms *in theory*, as was also shown in actual practice. It is a peculiar property of phenolic bactericides that halving a given dose more than halves the antibacterial activity, thus Para-Chloro Phenoxetol



Photograph] [*G. J. M. Timmerman*

A species of Charax *with dorsal and caudal fins infected by Fin Rot disease which is believed to have a bacterial cause.*

was a great deal more effective than the other materials. It is of interest to note that the organisms must be very hardy to resist the strong carbolic solution for two hours. Dr. Boehm also pointed out that they survive a temperature of 100 deg.C. (moist heat) maintained for 20 minutes and that they cause an infection of the eye in guinea pigs. My in-vitro results show that more than ten times the therapeutic dose of Phenoxetol is necessary to inhibit the growth of these organisms, and yet the fish are obviously cured by the normal amount. The reason for so large a disparity is not yet fully understood, but it is hoped an explanation will be found later.

Stock solutions of the substances are made-up as follows:—

Phenoxetol: 1 cu. cm. Phenoxetol + 99 cu. cms. of water (1% v/v)

Propylene Phenoxetol: as for Phenoxetol (1% v/v)

Para-Chloro Phenoxetol: 0.1 gram of Para-Chloro Phenoxetol dissolved in hot water with vigorous shaking, and diluted to 100 cu. cms. (0.1% w/v). Allow to cool.

Phenoxetol may be used in the concentration 10 cu.cms. of stock solution per litre of aquarium water, and the same applies for Propylene Phenoxetol. Para-Chloro Phenoxetol is used at 50 cu. cms. of stock solution per litre or, for greater convenience, the required weight is calculated (0.05 grams

* A full explanation of see WATER LIFE, December 1950, page 285.

per litre), dissolved in hot water, and slowly added to the tank water. It is a simple matter to ascertain the number of litres in a tank, by calculating the volume of water in cubic centimetres and dividing the result by 1,000. Thus a tank measuring 24×12×12 in. or 60×30×30 cm.=54,000 cubic centimetres—divided by 1,000=54 litres of water, excluding any space taken up by rock or gravel.

The dose may be added direct to the tank (it should not damage plants) if epidemic conditions exist, or single cases may be treated in glass or enamel containers. It is not esssential to have the doses absolutely correct, and considerable latitude is allowed in the amounts quoted. It is important that the fish receive an adequate supply of oxygen, especially if Propylene Phenoxetol is used. None of the Phenoxetols decomposes rapidly, so it is unnecessary to make further additions unless the disease proves resistant. The temperature should be maintained at or above 60 deg.F. Generally Fin Rot cases improve after three days of treatment but, if no progress is apparent after this period, the affected portion of the fin should be cut away.

Cases of White Fungus normally improve within 24 hours in Phenoxetol and four to five hours in Para-Chloro Phenoxetol. This will depend on the kind of Fungus causing the infection. The therapeutic action of the Phenoxetols may be accelerated by the addition of a small quantity of calcium chloride or sodium chloride (salt). It should be remembered that both Fin Rot and Fungus may occur as secondary conditions to other diseases, and treatment will not cure them unless the primary disease is dealt with also.

It is difficult to assess the reaction of all fish to treatment with the Phenoxetols, and most of the research has been connected with varieties of Goldfish. Where tropical fish are concerned it is advisable to add the total dose in two parts, with a 24-hour interval between each. This is important with Para-Chloro Phenoxetol, where a slow drip addition is probably the best method. Young Veiltails remained in Phenoxetol for a month without showing signs of discomfort and Red Swordtails were "dropped" in Para-Chloro Phenoxetol and are growing well at the time of writing. Phenoxetol has been used in conjunction with quinine dihydrochloride for the treatment of White Spot and its complications in adult Veiltails. All three Phenoxetols may be used in conjunction with Acriflavine and Penicillin (doses not yet known) but not with Formaldehyde.

Other diseases for which the Phenoxetols may be effective are:— *Ichthyophonus*, bacterial Dropsy, Mouth Fungus, "Bloom" Disease, Scale Protrusion and bacterial and Fungus diseases generally. Aquarists who obtain results with any of these are asked to inform the Editor of this journal as, even if the results are negative, the information is of value.

More Experiments Necessary

Although Para-Chloro Phenoxetol has been found effective in some cases of resistant White Spot it may not be recommended for this disease until further experience is obtained. The Phenoxetols can generally be regarded as ineffective against diseases of animal origin and Para-Chloro Phenoxetol is the only one that shows some activity in that field. It should be remembered that these drugs were designed for use against the fungi and bacteria, which are included in the Plant Kingdom.

Phenoxetol and Propylene Phenoxetol may be obtained in bottles of 25 cu.cms. and Para-Chloro Phenoxetol in 25 gram lots. These are the smallest packs available, and although prices may appear high at first sight so little of the material is required that with the most expensive, Para-Chloro Phenoxetol, it only costs about eightpence to dose a 24×12×12 in. tank.

The author wishes to thank Dr. Erich Boehm, F.R.I.C. and Mr. W. H. Cotton, F.Z.S., F.R.M.S. for their kind co-operation and assistance.

— Know Your Fishes —

No. 29

Plecostomus plecostomus

Photograph] [*G. J. M. Timmerman*

If there was ever an ugly duckling of the aquarium then the Catfish *Plecostomus plecostomus* is certainly it. Yet, like the ugly duckling, it is quite harmless although its eventual large size does not make it the best of occupants for a well-planted community aquarium of fishes.

The species belongs to the New World Spiny Armoured Catfish Family—the *Loricariidæ*. The bodies of Loricariid fish are covered, except on the underparts, with bony plates possessing small spines. Fish of this Family can withstand many hours of exposure out of water. They are capable of making audible grunting sounds which can be clearly heard after they are caught.

The head of *Plecostomus plecostomus* is broad and comparatively flat whilst the rear-part of the body is quite slim and tapering. The mouth forms a sucking disc on the underside of the head. Because of this sucker-like mouth, Loricariid fish (including *P. plecostomus*) do not inhale water in the usual way. It is taken in through the upper half of the gill slits and expelled through the lower half.

Body colour is grey-brown and dark markings occur on the back sides. The head, particularly, is peppered with small black dots and these may continue in approximately horizontal lines along the sides. Faint dark and light spots, also arranged roughly in lines, are present in the fins. The caudal fin often shows dark vertical barring. An adipose fin is present and the dorsal fin is large.

As the modification of its mouth would suggest *P. plecostomus* is a great eater of soft Green algæ and will clasp either rockwork, sides of the aquarium or plant leaves with its mouth whilst clearing them of algæ. It does not damage plants except in its grubbing movements at the bottom of the aquarium when they may become uprooted. This is the reason why only small specimens, say up to 4 or 5 in., are really suitable for planted tanks. In Nature the species grows up to 15 in. long but such a length is not achieved under aquarium conditions and specimens rarely exceed 8 in.

Apart from algæ, which is a necessary item in its diet, live and prepared foods are taken voraciously. Temperature range is 65-82 deg.F., with 75 deg. a suitable mean. The species has never been bred in aquariums. It is largely nocturnal in its activity.

The habitat ranges southwards from the Panama slopes to Uruguay. Class: *Pisces*. Order: *Ostariophysi*. Suborder: *Siluroidea*. Family: *Loricariidæ*. Genus: *Plecostomus*. Species: *P. plecostomus*.

South Africa's Rising Interest in the Hobby

A Record of Post-War Progress

By N. G. Rose

HALLO, England; I am writing from South Africa or, more precisely, Johannesburg, for that is where I am living. It is July (mid-winter) here at the moment, though in comparison you might think it were summer. The ground temperature at noon today was about 70 deg. Even so we have to use heaters in our tanks. I have known the temperature to drop as low as freezing point quite often. Heating is actually one of our biggest problems, because one never knows when there will be a wide temperature fluctuation. We have a warm day, but a very cold night sets in just as soon as the sun goes down; the temperature can drop as much as ten degrees in as many minutes. A thermostat is almost an essential. Even those people who heat their fishrooms by means of central heating, use supplementary electric heating, as the drop in temperature can be much too fast for a coal stove to combat.

We also have a water problem. The water varies continually, and no fishkeeper can just draw water from a tap and be sure that the *p*H and hardness will be the same today as it was yesterday. On this page appears a water analysis which may be of interest. I am indebted to Mr. Brittan of the Rand Water Board for the data. Beyond these difficulties, the conditions here are much the same as in England.

The hobby was first introduced in to this country some twenty years ago—when a "madman", at great expense, bribed a sailor to bring him out a few Guppies and Platies, I think from England, but I am not sure. This, I believe, was the start of a hobby which has become one of the largest home interests in South Africa. Three years later about fifteen aquarists (out of around seventeen) got together and formed a society with the high-sounding name of "The South African Aquarists' Association". Their purpose was primarily to spread propaganda on the hobby and do anything they could to advance the "culture of tropical fish". I am afraid they were not too successful, but they did not give up. By the end of 1939 there were about thirty members, and there everything was suspended until after hostilities ceased.

AVERAGE COMPOSITION OF JOHANNESBURG WATER DURING 1951

	FROM ZUURBEKOM WELLS	FROM VAAL RIVER SOURCE		
		Lowest	Highest*	General
Solid Residue on evaporation	14.2	7.3	57.8	18.9
Alkalinity (Calcium Carbonate equiv.)	12.2	2.7	7.0	5.1
Hardness (Calcium Carbonate equiv.)	13.9	4.5	25.0	10.2
Calcium	2.7	1.7	7.0	3.0
Magnesium	1.7	0.2	1.7	0.6
Sodium & Potassium, expressed as Sodium	0.2	0.7	4.4	2.0
Bicarbonate (HCO_3)	14.3	3.3	8.5	6.2
Sulphate (SO_4'')	1.4	1.1	21.9	6.1
Chloride (Cl')	0.6	0.8	5.0	1.8
Silica (SiO_3)	2.0	0.8	1.2	0.9
Oxygen absorbed from permanganate (¼ hour digest in boiling water)	—	0.09	0.27	0.16
*p*H	7.8	8.2	9.5	8.7
Electrical conductivity (micro-mHos at 20 deg C.)	233	95	710	245

* The individual lowest or highest value of each separate constituent did not necessarily occur at the same time. The highest values were exceptional and occurred over short periods.

HARDNESS OF WATER SUPPLIED FROM THE VAAL RIVER SOURCE
(expressed as parts of Calcium Carbonate per 100,000)

Number of days on which hardness was:—	YEAR ENDED 31st MARCH				
	1947	1948	1949	1950	1951
Up to 6	—	12	46	5	40
Over 6 up to 8	81	107	123	148	87
Over 8 up to 10	153	129	122	136	95
Over 10 up to 12	81	67	42	35	74
Over 12 up to 15	40	24	28	7	34
Over 15	10	27	4	34	35
Minimum hardness	6.5	6.0	5.0	6.0	4.5
Maximum hardness	18	32	18	47	25

Strength of the Association

In 1948 the hobby started to "catch on", and membership rose steadily until today there are close on 300 active members of the South African Aquarists' Association. The society has held three public exhibitions, and their standard has been up to most overseas exhibitions. Naturally they have been small affairs, although the next one should be on a much larger scale—I believe the show committee expects a bigger entry than ever before.

Since 1947 the hobby has grown to a phenomenal extent. There are about two thousand enthusiasts in Johannesburg alone. Societies have been started in Cape Town, Pretoria, Durban, Bloemfontein, and other centres throughout the Union and southern Africa. We are lucky in our transport facilities; most of our towns are connected by air and therefore it is possible to send fish quickly and safely everywhere in the Union with very little risk of casualties. The hobby is going well not only in the Union, but as far afield as the Belgian Congo, Southern Rhodesia, South-west Africa, Portuguese East Africa, and many other territories.

As you will realise, this is no small country and, consequently, our population is continually moving. A firm opens a branch in new territory and immediately staff have to be moved from head-office to run it. As a result one of the most common questions I am asked is, "How can I move my fish . . .?" Wherever our aquarist friends move though so in their trail they leave a few disciples.

Now I would like to introduce you to a few of our leading lights and pioneers. Mr. S. D. Naude has been keeping tropical fish for eighteen years, and is one of our most successful fish breeders. By profession, Mr. Naude is a builder, but I do not think he is ever as happy as when in his fishrooms. He raises about one thousand fish a week, and is one of our largest wholesale suppliers; but, above all, he is a fish-fancier. I was at his home in Pretoria the other day, and he showed me around. It was an experience I shall not forget in a hurry. I saw tanks of Angel Fish (*Pterophyllum*) of all sizes, tanks containing Bloodfins (*Aphyocharax rubripinnis*), in fact, tanks with very nearly every variety.

The average person is well pleased if he raises 50 Black

Widows (*Gymnocorymbus ternetzi*) at one spawning, but I saw spawnings of two hundred and more. I also saw Johannes. Johannes is a Zulu. He has worked for Mr. Naude for about fifteen years, thirteen of which he has spent looking after the fishrooms. That day, Johannes proudly showed me Angels, Bloodfins, and many other varieties which the "Baas" had allowed him to try and breed. In the second room, he showed me the results and, believe me, they were worth seeing! The African native has a flair for

Photographs] [*G. J. M. Timmerman*

Lemon Tetras, a species which has been bred in S. Africa.

keeping things alive. It is quite amazing to see how a native will care for, and usually heal, a sick animal—sometimes even after the vet. has given up hope. I asked Johannes how he managed to do it. He said is was nothing to do with him. "The fish do it all by themselves Baas", he informed me, "all I do is to keep their houses clean and tidy". And there, I think, is the answer to most problems.

Among the most active members of the South African Aquarists' Association is the present vice-president and past-chairman, Mr. Walter Meano, who, with his wife, maintains a fair-sized fishroom (about 120 tanks), varying in size from about 5-150 gallons. The room they use was specially built in the garden of their home, and is profuse in tropical plants as well as exotic fish.

Mr. Meano started out as a Goldfish fancier, and has since been converted to tropicals. He is one of the "pioneers" of the hobby, having been an ardent aquarist for the past eighteen years. He is eminently successful as a breeder of Angel Fish, and was one of the first to really breed them in any quantity here. Recently he has also had considerable success with Glowlight Tetras (*Hyphessobrycon gracilis*), Neon Tetras (*H. innesi*) and Lemon Tetras (*H. pulchripinnis*). The Glowlights and Lemon Tetras have been bred in good quantities—his best being 161 in one hatching.

Breeder of Neons and Penguin Fish

Among others of our more prominent aquarists stands Mr. Glueck. By trade an engraver, Mr. Glueck shows the same meticulous interest in his fish as is needed in his work. He is only one of the "Guppy converts". His son came one day with a jam-jar and six Guppies. Today, their fish-room boasts about 180 tanks. Mr. Glueck does not specialise in any one species of fish, but is amazingly successful with whatever he touches. He has bred Neons and Penguin Fish (*Thayeria*) galore, among many others.

Last, but far from least, I would like to introduce you to Mr. Jack de Bruijne. I think that Jack de Bruijne warrants the title of "the most useful man ever to have joined the Aquarists' Association". He is today our chairman, but he is also Senior Bacteriologist to the South African Institute for Medical Research. He is at present carrying out invaluable research into fish diseases, and it is interesting to note that he has shown, among other things, that "Wasting Disease" is not Tuberculosis, as is often thought. He has examined many fish and has found a number of causes for this condition, amongst which is a form of muscle disease known as Myxospiridiosis. He is now busy preparing a paper which should prove most interesting.

There has been surprisingly little research into South African water life. This is primarily due to the risk of disease and the expense, but also, a certain extent to Government action. It is illegal to remove native fish from their home waters. The Piscatorial Society have had to import their own fish, breed them here, and then release them in enclosed water, as there is another law in operation which prohibits one from stocking running water with fish. There are many reasons for these regulations, most of them good ones, but they are hard on the amateur research worker. To be so near to untold jam, and not to be even allowed to get one's fingers sticky, is just too much. It is possible to get a permit, but such a permit is not very elastic, and requires all but a diplomatic corps to fill in the papers.

The risk of disease is yet another deterrent—one *can* run the risk of malaria, blackwater fever, and, worst of all, bilharzia. However, even so small an amount of research as does go on, has had results. We have, for instance, discovered a fish of the Cichlid Family, locally called Kirpa. This little fellow is rather like a Firemouth in shape and in colouring somewhat similar to an exaggerated *Aequidens portalegrensis*. At first we were quite pleased with our find, until the unfortunates who had put them in with other fish, quite quickly found that the other fish had disappeared!

Red-tailed Tetra

We also have discovered a Tetra which, when full grown, is about 2 in. long, and has a reddish tinge to the fins, particularly noticeable in the tail fins. This fish has become known as the Red-tailed Tetra. We also have a series of fish known as Gillie-Minkies, which are of the Barb group. They are long in shape, usually olive green, shading to an underside of silver. They have either a black lateral line running along the body, or else a series of dashes, as though pieces of this line were missing.

There are really beautiful fish in Africa, some of which have already been exported but I suspect that not even the surface has as yet been touched. There are also livebearers here; the *Gambusia* for one. Large quantities were imported originally to destroy mosquito larvæ but subsequent examination has shown that either the Cuban Gambusia has developed differently in African waters, or else a variety

A pair of the brilliant but pugnacious Jewel Fish (Hemichromis bimaculatus), *a Cichlid found in tropical areas of Africa.*

already existed here. I have heard stories of fish very similar to the Guppy being found in waters close to Durban in Natal.

Certainly one fish already has been named after the district. In Natal the first Peacock Cichlid (*Tilapia sparrmani*) was found. Unfortunately up to date most of the fish found in Africa have been of the more vicious types—like the Jewel Fish (*Hemichromis bimaculatus*)—but we are redeemed a little

by such fish as the so-called Rainbow Panchax (*Nothobranchius rachovi*). Then there is the *Epiplatys chaperi*, another beauty. Next, the Lyretail (*Aphyosemion australe*). All these prove that there is more gold in Africa than most aquarists ever thought. I do not know if it will be possible for some years yet to get many of these specimens over to England, but if there is anyone sufficiently optimistic and keen to try, I am sure the effort will be worth while.

Earlier on, I mentioned that the expense of an expedition would be great. This is due to the immense distances one would have to travel before one could get to any suitable spots. A friend accompanied me on a prospecting trip last Easter. We went up to the Northern Transvaal, starting off on the Saturday afternoon and returning to Johannesburg on the Monday evening. Yet, in that short time, we travelled some eleven hundred miles. When I first arrived in Africa from England, I was quite amazed at the way people talked about travel. They spoke of going from Johannesburg to Durban (over 400 miles) much as I would have, had my wife suggested driving down to Brighton from London.

Unfortunately, Johannesburg is too high to be of the slightest use from the indigenous fish point of view. We are close on 6,000 ft. above sea-level, and our temperatures are not much higher than those of the average English summer—whenever, that is, England has one ! The sun, however, is very strong, and during the summer months sun-glasses are a necessity and not a luxury.

There are some extremely interesting sea fish around these shores. The Monodactyl and *Ambassis natalensis* are the best known. The first is a fish rather like the Scalare in shape. The second is almost a duplicate of the *Ambassis buruensis*. These have recently been acclimatised to freshwater and are being introduced to the South African aquarist making a most interesting addition to our collections.

A particular friend of mine, Mr. White, late of the Nottingham Aquarists' Society, has asked me to pass on his regards to all the folks at home. I shall be pleased to hear from anyone who might like to hear more of the African field of activity. Letters should be sent c/o the Editor of WATER LIFE.

Systematic Study of Pond Life

2. Zonation of the Pond into Four Distinct Sections

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

IN my last article I gave some idea of the methods that can be used for gaining an insight into the *kinds* of creatures that live in ponds. In this contribution I want to deal more particularly with the various zones in which they live. These may be summarised broadly as:—

1. The surface-film of the water.
2. The open water.
3. The bottom of the pond and the vegetation rooted in it.
4. The bottom mud.

Each of these zones has its characteristic forms of life which are peculiarly adapted to live there.

Surface-film

On the surface of all water is a film which, although not differing chemically from the rest of the water, is in a peculiar physical state of tension. It behaves as a skin and can support light objects above it and will enable small submerged creatures to hang suspended from it as if held by a sticky material. Most of us, in childhood, have observed the properties of this film by floating a needle on a tumblerful of water.

The surface-film supports a varied fauna. In the first place there are several groups of insects, mostly belonging to the Order *Hemiptera* (or true bugs: insects with piercing mouth-parts). These are adapted for living in their strange environment by having long legs which, by distributing their already slight weight over a large area, enable the creatures to walk as confidently on the water surface as if it were ice. The legs, moreover, are often provided with water-repellant hairs which prevent the limbs from getting water-logged and breaking the surface-film.

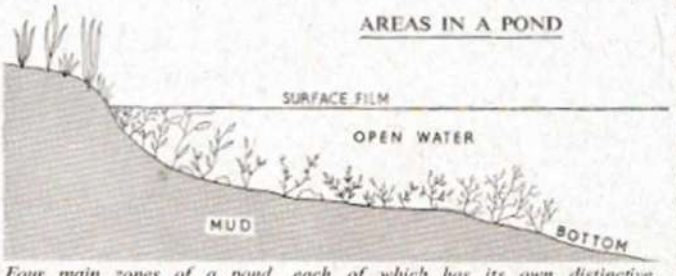
The best-known members of this fauna are the Water Skaters (*Gerris*) which may be seen gliding quickly over the surface of most ponds or on the still waters of slow streams. The Water Crickets (*Velia*) and that remarkable insect the Water Measurer (*Hydrometra stagnorum*)—so thin that it does not seem possible there can be any room whatever for internal organs—are other surface-film dwellers.

Photograph] [J. Clegg
A Water Measurer.

The underside of the surface-film also supports its own characteristic fauna, the best known members of which are the larvæ and pupæ of Gnats such as *Culex pipiens*. They hang suspended from the film for much of their life, the larvæ upside down and the pupæ head upwards. Both are assured of an adequate air-supply from the atmosphere, the one drawing food to its head by creating currents in the water, the other awaiting its final transformation to the winged and aerial insect.

Open Water

The open water of the pond, usually towards the centre where it is relatively free of water plants, supports on the one hand the largest and on the other the smallest of the pond organisms. The fish—by far the largest predators—mainly live there but in striking contrast are those minute animals and plants, collectively called plankton (Greek = wandering, roaming) because they appear to float about aimlessly in the water. In recent years much has been found out that has rather upset our ideas on the aimlessness of their drifting as we shall see in a later article. Single-celled animals and plants (*Protozoa* and algæ), Rotifers



Four main zones of a pond, each of which has its own distinctive flora and fauna frequently present in very great numbers and variety.

or "wheel animals" and crustaceans, such as *Daphnia* and *Cyclops*, form the bulk of this community in the open water, perhaps the most important of all the communities from the fact that it provides the main food supply of the pond.

Bottom of the Pond

The bottom of the pond, which includes not merely the surface of the mud but also the leaves and stems of the plants rooted in it, affords, as all pond-hunters know, the richest variety of creatures. The plants themselves provide support and niches where the creatures can be relatively safe from their enemies. It is somewhat of a revelation to a novice to pull up a water plant and examine it closely with a hand-lens over a white dish. The number of creatures that can be attached to it is often almost unbelievable—sponges, *Hydra*, Rotifers—particularly those in cases such as *Floscularia* (*Melicerta*) *ringens*, flatworms, leeches, threadworms, moss animals (*Polyzoa*), perhaps a few crustaceans such as the Water Louse (*Asellus*), water spiders, many kinds of insects and, of course, snails of several species.

The plants are serving not merely as supports but in many cases are providing food directly, or indirectly, by giving anchorage to minute attached plants, such as Diatoms which form the diet of the smaller creatures.

The surface of the mud itself supports many animals, such as the scavengers, the Water Louse (*Asellus*) or, if a stream feeds the pond, perhaps also the Freshwater Shrimp (*Gammarus*). A new member of this group, which has been noticed only in the last few years but which is now spreading quickly, is *Eucrangonyx gracilis*, a creature so like *Gammarus* that is has probably been overlooked in the past, but which will well repay close study. Other members of the bottom fauna in large ponds and lakes with muddy bottoms are the freshwater mussels. They need a substratum which is soft so that their muscular foot can be embedded firmly in it for anchorage. There they remain, shells slightly gaping, passing over their body a constant current of water bringing vital oxygen and minute planktonic plants and animals for food.

The Bottom Mud

Finally, there is what might seem the most unpromising zone of the pond, the mud itself. Yet even here there is a surprising number of creatures which, in order to exploit the rich food supply in the form of detritus—broken-down and partly decomposing plant and animal remains—are highly specialised to overcome the disadvantages of living there. Most important among the hardships to be endured is the lack of oxygen. The process of bacterial decomposition always going on in the mud, uses up much of what little oxygen there is and the creatures living in the mud must therefore be able to exist in conditions of serious oxygen deficiency. The familiar "Bloodworms", the larval stages of two-winged flies such as *Chironomus*, many of which live in the mud in little tunnels, have a blood rich in the red pigment hæmoglobin such as we ourselves have. This material has a great affinity for oxygen and enables the "Bloodworms" to make the most of the little oxygen available. The same pigment is present in some of the true worms (relatives of the Common Earthworm) which live in the bottom mud, such as the Sludge Worms (*Tubifex*). In addition these latter creatures have long hair-like "tails" which are projected into the water above and, by constantly waving about, exploit as wide an area as possible in search of the vital oxygen. Food supply is so abundant in the mud that those creatures which are adapted to the difficult conditions there can exist in great numbers and most aquarists must be familiar with the great quantities of *Tubifex* that can be obtained from some muddy areas.

In most of these zones there are, of course, smaller micro-habitats, each of which would be a rewarding study in itself. For instance, the undersides of stones on the bottom would probably be found to harbour a characteristic fauna—flatworms, leeches and other creatures or their eggs—as would the underside of floating leaves (the larvæ of China Marks Moths, *Polyzoa*, etc.) or the inner tissues of some of the tall water plants (certain species of "Bloodworms", caterpillars of some moths, leaf-mining beetles). Or again, each of the plant-zones mentioned in the last article could be made a complete study in itself. But the four main types of habitat described will serve as a start in our systematic study of pond life and, when we are familiar with the characteristic creatures in them, it will be time enough to specialise in one of the micro-habitats.

Large Wainscot Moths

— By —
H. C. Huggins, F.R.E.S.

Photograph] [*L. E. Day*

IF you look over the yellowing reeds standing in shallow water on a cold night in October you will probably see a large whitish moth on a stem or leaf. This will be the Large Wainscot Moth (*Rhizedra lutosa*), which is the last of the Water Moths to appear on the wing. Like all the Wainscots it bears a strong protective resemblance to a reed and, when the leaves and stems are well bleached in the autumn, it is not easy to see by the light of a torch.

The Large Wainscot varies greatly in size, a small male measuring perhaps only 1¼ in. across the wings, whilst a large female may be an inch larger. Its colour also is very varied, some specimens being wholly pale cream, except for a few tiny black spots, whilst others are very heavily suffused with black. Another range of variation goes from cream to a deep reddish-brown.

The food of *R. lutosa* is the Common Reed, on a leaf of which the egg is laid in the Autumn. In the Spring the young larva makes its way into the root of the reed, where is feeds usually under water, until the time for pupation comes. Unlike most internal feeders, which generally effect their transformation in the larval burrow, it then leaves the root and pupates underground or, if necessary, ascends the stem and makes its way to the ground.

This moth species is normally a very sluggish creature and no net is necessary for its capture. It flies for a short time around the reeds at late dusk and then settles on them. It may be placed in a box without much trouble. It has, however, a powerful and sustained flight at times and may possibly migrate, as it has been seen flying round electric street lights, which have a strong attraction for it, at considerable distances from the nearest reeds.

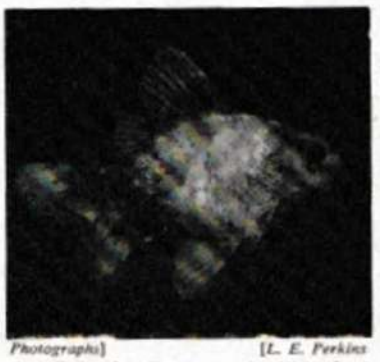
Perhaps the oddest feature is its habit of frequenting poor and miserable reed-beds instead of large and flourishing ones. To search for it in a fine well-grown reed-bed on the edge of a lake or broad, is to court disappointment, in such a place it will usually be very scarce.

If, however, a ditch can be found leading from such a locality, with a fringe of scattered reeds, *R. lutosa* may be sought with some confidence. It is particularly common where such ditches run by the side of river-walls, or where they follow railway lines, especially in coastal districts. On the edge of these it can be found from late September till early November usually on reeds, where it feeds, but sometimes on species of Reed Mace, Willow-herb, or even on blackthorn bushes overhanging the water.

Finnage of Fancy Goldfish

By N. E. Perkins

BEFORE considering the finnage of present-day Goldfish types, perhaps it would be as well to review briefly the development of fins in general for only by so doing can the significance of what has occurred be properly appreciated. It is generally agreed that the prototype fish was finless and moved by serpentine motion. This motion, by creating different pressures in the surrounding water, had caused the fin-fold which later developed. A remarkable, yet simple, experiment was carried out by Mr. J. T. Cunningham. He took a penholder, covered it evenly with wax and, holding it by one end, moved it rapidly from side to side in a basin of hot water. The result was the appearance of a vertical "fin" above and below which, in the space of five minutes, had increased to about ½ in. in depth. If we examine a fish for the first few days of its life we shall find a very similar appearance, except that the growth cannot be attributed directly to pressures but to the inheritance of the past, gradually occasioned over the ages by environmental pressures.



Photographs] [L. E. Perkins

A well-developed, nine-week old Veiltail.

At some period in the distant past the continuous vertical fold became divided underneath to form two median folds, one on either side of the fish, so that a far greater stability was thereby achieved. This single dorsal fold and double ventral fold can be seen today in the embryo fish. As the young fish develops so the fin-folds become divided, parts disappearing altogether so that the normal finnage, customary to the species is finally left to develop. It is here that trouble is encountered when breeding the more fancy varieties of Goldfish for they are not a separate species from the common ancestor, *Carassius auratus*, but are merely the result of selection from time to time of such variations as have arisen. To fix such variations so that they become a permanent and reliable feature of the fish would be a difficult and long job even if no fish were used except those conforming exactly to the desired standard. As the position is at the present time, with the general shortage of specimens resembling the standards, the object is well nigh impossible to attain. It is made the more difficult as quite excellent specimens can be obtained from crossings of very poor fish which, unless one knows that this has occurred, can lead to the rapid deterioration of otherwise fair stock. The only remedy is to continue with fish that one has previously bred and to refrain from introducing any new blood; only thus can one be sure that each generation has conformed as nearly as possible, to the desired standard.

With the continued selection for longer finnage a peculiar situation has arisen. Contrary to the growth of wild fish, the long-finned fancy Goldfish continue to develop finnage in excess of body growth throughout their lives, some to a very marked degree. This is a result of selective breeding. That the creatures in question require a little more attention than the varieties of more orthodox shape goes without saying, but the aquarist is quite prepared to give this attention and, in fact, enjoys doing do, it being sufficient reward to see the graceful movements of these amazing specimens.

There is a period in the life of such fish when they can be said to be at their best, depending on the rate of fin development of the fish in question. Usually this period is between 18 months and 3 years, most specimens tending to deteriorate (from the show point of view) after this. The deterioration is caused in two ways. Firstly by damage which results in uneven growth and, secondly, by the development becoming somewhat excessive with the result that the caudal and dorsal fins droop because the rays are not strong enough to support the increased area of fin. In either case the real beauty of the fish is gone and it does appear that there is ample room for experiment to produce fish which will mature later but maintain their carriage longer. Their fins can also be ruined in early life by attacks of Flukes, these creatures causing the fins rays to break off or grow twisted. It will be seen that unless one is prepared to give a great deal of attention to the fish, it would be better to concentrate on species or varieties a little less exacting in their requirements.

The characteristics of a species are controlled by many diverse causes which act in much the same way as pressure and mould upon plastics, the genetical factors being but a result of the inheritance of the effect of these pressures. The existing variety of species and possibility of variations among them illustrate perfectly that environment is a major cause of variation. It is, of course, possible to consider genetics alone provided the time under review is of short duration but let that time cover ten thousand or more years and environment might affect the genetical factors unbeknown to the experimenters.

When we apply the genetical theory to specialised breeding we are but employing a condition of things that has itself been formed by environmental pressure and when we consider the fluid nature of life as regards change and the reciprocal action of cause and effect, the problems are by no means as simple as we could be led to believe. To attempt to prophesy the cause of living matter when the only steady feature about it is its continual change and modification is not easy but to recognise some

(*Contd. on p.* 263)

Left: a two-year Veiltail. Right: a Veiltail five years of age, showing excessive finnage development.

Breeding Chinese Bubble-eyes

First Recorded Spawnings in Great Britain

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

IN the last issue of WATER LIFE I mentioned that Mr. T. Horeman had kindly allowed me to borrow the specimens of Bubble-eyes that he had imported from China. One pair has now spawned twice and I thought a few notes on the fish and their young would prove of interest.

Like Celestials, these Bubble-eyes have comparatively long bodies (depth is half of the length), their divided caudal fin is not excessively long, and there is nothing exceptional

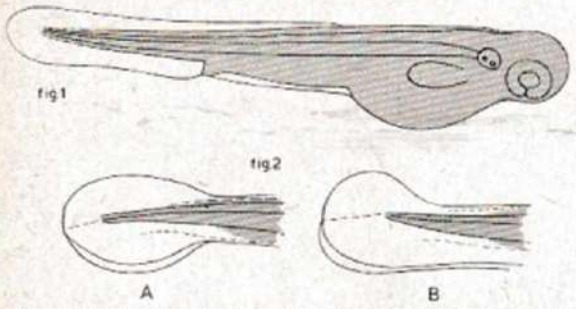


Fig. 1. Singletail at the time of hatching. Fig. 2A: enlarged caudal region of an unusual Bubble-eye on hatching. Note that both the upper and the lower parts of the fin fold do not extend forwards. This specimen developed a divided caudal fin but no dorsal or anal fins. Fig. 2B: enlarged caudal region of a normal Bubble-eye at hatching. The lower part of the fin fold extends well forward, whilst the upper part does not.

about the other fins except for the absence of the dorsal. The dorsal and anal fins of a fish, and to a lesser extent the pelvic fins, act in the same way as the centre board of a yacht and prevent the fish from being swept sideways. In Bubble-eyes, however, with their lack of dorsal fins it is noticeable that the fish "skid" sideways when attempting to make a sharp turn.

Nature of the Bubbles

The bubbles are not really part of the eyes but fluid-filled bags around a normal eye—the greatest development being on the underside.

The fish on loan to me, which had been in containers for three months on their journey from China, were in good condition but not ready for breeding when I first received them. A few weeks elapsed before the first spawning occurred, and when it did take place many eggs proved to be infertile.

The temperature of the water containing the eggs fluctuated between 61 and 83 deg. F. The alevins hatched in three days and most of them were free-swimming on the fourth day.

On hatching, young Bubble-eyes appear similar to Common Goldfish when they are attached to the side of a tank but, on being examined under a microscope, a number of differences may be observed. The dorsal fin fold seen in the Common Goldfish is absent in the Bubble-eye while the lower fin fold is divided (Figs. 1 and 2). As the fish develops the end of the tail turns up and the upper single part of the tail-fin fold becomes relatively insignificant. In addition the divided underpart of the fold turns round so that it is at the end of the tail. The actual structures themselves do not turn but they move because they are attached to regions which become bent by differential growth.

In some of my newly-hatched alevins a few traces of the "missing dorsal fin fold" could be seen. Such specimens eventually have "spike dorsals" or bumps on the back. In all the young fish there was none that would develop a true dorsal fin.

Fig. 3. shows outline drawings indicating the changes in shape that occurred during the first five weeks. Although no real bubble exists, the eyes of fish when about ½ in. long did not appear normal as there were pale pink, crescent-shaped regions beneath each eye. When the fish were approximately an inch long, however, the bubbles had definitely formed and in some cases bulged out from the general surface of the body.

The fry changed colour remarkably quickly. After five weeks the colour change of one specimen had been completed while at seven weeks approximately twenty per cent had begun, or completed, their colour change.

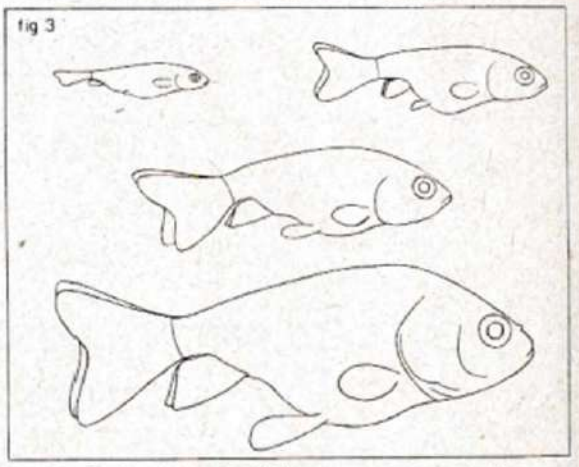
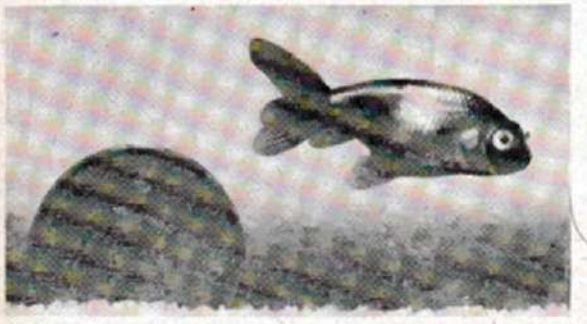


Fig. 3: development of Bubble-eyes—variations in shape as the fry grow to a total length of 2¼ in. Sketches by the author.



Photograph] [L. E. Perkins

Two-month-old Bubble-eye from the author's spawning.

Possible Greater Body Depth

Although it is too early to say with certainty how the young will progress, it would not surprise me if the body shapes were deeper than those of either parent fish.

It would seem that what I have been able to do could be emulated by other aquarists. Adult specimens are available and when paired up and given the right conditions there is no reason to suppose that they could not be induced to spawn quite readily. It would be interesting to receive reports from breeders on the results they obtain.

Amphibians and Reptiles of the British Isles

5. Common and Sand Lizard and the Slow-worm

By Alfred Leutscher, B.Sc.

Gravid female Common Lizard (Lacerta vivipara). *These lizards are found all over Gt. Britain. Photograph by S. Crook.*

So far in this series of articles we have been considering the eight species of amphibians which are native to Britain. To complete the picture we must now turn to the reptiles—recognisable by their scaly covering—and here the numbers are even less. We can boast only six present-day species.

The days of dinosaurs, crocodiles and tortoises in these islands now belong to the distant past, and to-day we are left with a poor legacy. Three lizards and three snakes are all we can show for a great Class of animals which once dominated the earth. Snakes and lizards, which make up the Order *Squamata* (from the Latin—*squamus*, a scale), are of comparatively recent origin. They evolved somewhere towards the end of the Dinosaur age, during the Cretaceous Period, about 70 million years ago. Were it not for the Ice Age, which swept this country millions of years later, the numbers of native lizards and snakes might have been very much greater, but the intense cold drove them all away. It was only after the last wave of ice had retreated, about ten thousand years ago, that a few species managed to wander back, and this had to take place during the short period of a few thousand years before Britain broke away from the Continent and became an island. Since Ireland separated first, it received the fewest species. To-day it has only one native reptile, the Viviparous Lizard (*Lacerta vivipara*).

This well-known lizard may be found on the mainland almost anywhere from Land's End to John o' Groats, both at sea level and on mountain tops. In Europe it ranges from the Atlantic sea-board, across Europe and well into Asia, and from the southern mountains to some way within the Arctic Circle. In length it measures up to 6 in., provided that the tail is still intact. The colouring is extremely variable, and not easy to describe even in general terms. The ground colour may be some shade of grey, yellow, brown, even reddish or black, and marked with longitudinal rows of light spots often with a dark, vertebral line. The flanks each have a broad dark band edged with whitish lines above and below. The lower-parts in the male are usually brighter—an orange or vermilion—heavily spotted with black. Some males reflect a beautiful green tint in certain lights. The female below is much paler—a yellow, orange or grey—with fewer spots.

The Common Lizard will often be seen during a walk in the countryside basking with its little body flattened against a log or wall. It is by no means easy to catch but, if one sits quietly near its home, it will soon come out and even crawl on to a hand or clothing. It lives in dry, sunny places, such as in hedgerows, heaths, commons, woodland glades, waste land and gardens. The young are born alive (ovoviviparous) as the name suggests. They are "laid" in a transparent bag from which the youngster struggles out. This usually happens in July or August, when the females can be found swollen with young. It is even possible to predict the numbers of young, by counting the bulges in the mother's body. From seven to nine is an average family, and the babies at birth are almost black in colour. Sometimes eggs containing yolk are laid, and these have actually been found in high places, such as the Pyrenees. It appears that these mountain lizards have retained the primitive, egglaying habits of their ancestors. I have induced British specimens to lay eggs, by keeping them in cool and damp surroundings.

Photograph] [*L. E. Day*

Sand Lizard (Lacerta agilis), *an attractive species that, unfortunately is becoming very localised in its distribution.*

The Sand Lizard belies its scientific name of *Lacerta agilis*, and is by no means as swift as its smaller relative. The size here can be up to 9-10 in. especially on the Continent. It is mainly a W. European species and recognised by the much blunter head, more thickset body, and, to some extent, by the colouring. Here again this is variable. The male is usually a grey-brown or reddish, with bright green sides and underparts during most of the summer.

Photograph] [*L. E. Perkins*

Slow-worm (Anguis fragilis). *This specimen has lost its tail and shows only a developing stump in its place.*

Left: a typical area where Common Lizards might be found. Right: the type of country side inhabited by Slow-worms

Photographs] [*L. E. Day*

It can easily be mistaken for the Continental Green Lizard (*L. viridis*), which occurs now and then in this country as an escapee. Specimens liberated here and there, as in S. Devon in 1937, can still be seen. The female Sand Lizard is more uniform in colour, grey or brown, with the flanks sometimes marked with rows of conspicuous "eye-spots" (dark brown patches with white centres).

Mating of this species takes place in late spring, the mother laying her clutch of eggs in June or July, often in captivity, by digging a nest in the loose soil and then covering them up. The nest is often dug under a log or stone. An average of eight to 10 eggs is laid, the young appearing in August. They look like pale replicas of the parents.

By nature the Sand Lizard is a gregarious reptile and lives in colonies. In this country it seems to prefer sandy and heath-land country, such as sand-dunes and where heather grows. The distribution in Britain is very patchy, and many of the old records are now unreliable. It is a sad fact that our discovery of the seaside for holiday resorts (this goes back little more than a century), has resulted in the extermination of many old haunts. Very little coast-line suited to this lizard is now left undisturbed. Here and there it can still be seen, and the most likely area is its main stronghold in the south, on the dunes and heaths around Poole Harbour in Hampshire and Dorset. Other localities are the Frensham area of Surrey, and parts of the Lancashire coast. The collecting of specimens, either for the vivarium or for sale in pet shops, has not helped in retaining it as a native species, and it is to be hoped that this lizard will be given all the protection it needs, before we lose the species altogether.

Both these lizards should be readily recognised in the field. It is the third species, the Slow-worm or Blind-worm (*Anguis fragilis*), which may lead to confusion. Its serpentine body and absence of visible limbs has probably caused the destruction of many a useful Slow-worm, in mistake for a snake, which is a pity since this creature devours a great number of slugs and other garden pests. A good-sized specimen measures eighteen inches, with tail complete, which is not often the case as a surprising number of Slow-worms seem to lose their tails. A stump-like substitute then grows in its place. The lizard-like characters may be seen on the head, such as the scale pattern, the moveable eyelids, and the fixed jaw bones which can only be moved for opening and shutting the mouth. This limits the size of the prey. In snakes the belly scales, or scutes, are broad in shape, whereas in the Slow-worm, the small, tight-fitting scales are more or less uniform in size all over the body.

Colour is again variable and may be in grey, brown or even black, sometimes with dark, longitudinal lines along the body, especially in females. The smaller male has a more noticeable neck region and is sometimes scarred due to bites from its rivals. Specimens are sometimes found with a scale here and there, coloured a deep blue. These very beautiful Blue-spotted Slow-worms are more usually males.

Slow-worms may be found almost anywhere in Britain, except Ireland, in places where they are undisturbed. Damp woods, borders of lanes and fields, waste ground, railway cuttings and country churchyards are some of the most likely places in which to find them. In dull or very hot weather they will retire, and are fond of burrowing into soft soil or crawling into rodent burrows. They can often be found hiding under planks, stones or sacking which may be lying about on farm land. A search in a rubbish dump near a village or wood will often reveal a Slow-worm or two.

The babies are pretty little creatures and easy to identify by their colour. This is a silvery grey above, with a dark spot on the head which extends along the back as a thin, black line. Families of about ten or more appear in August. They are born alive.

The Lizards (Sub-order *Sauria*) are well known to reptile lovers and usually make very satisfactory vivarium pets. For reptiles they show a good deal of intelligence, and display a lively interest in their surroundings. Their hearing is keen and they tame readily. When keeping them as pets their love of sunshine must be borne in mind. A complete lack of this may lead to trouble eventually. This is due to deficiency in vitamins provided by sunlight, and skin complaints can arise in the form of ugly lumps and blemishes. Dry vivariums should be used. A common fault is to keep lizards in damp conditions so that the skin is never quite dry. This encourages fungus infection, and the creatures then have difficulty in sloughing (i.e., shedding their skin). A vivarium containing dry sand, moss and heather, placed in a sunny spot and provided with a small drinking dish, is quite sufficient. Variety in diet is beneficial. Both Common and Sand Lizards will eat all kinds of insects, Meal-worms, spiders, occasional Earthworms and even sweet fruit.

By contrast the Slow-worm prefers shady and damper surroundings. A good layer of leafmould can be placed in the vivarium, with hiding places of stone, bark, etc., and a drinking dish. It likes to burrow sometimes for day on end, coming out to feed on slugs and Earthworms and even small pieces of raw meat when tame. It usually becomes tame readily, and will entwine one's fingers with a surprising grip, rarely biting, and moves about in a deliberate fashion. It is an ideal children's pet and has lived for 46 years.

Photograph] [*L. E. Perkins*

The head of a Slow-worm with the scale pattern, an identifying characteristic, clearly visible.

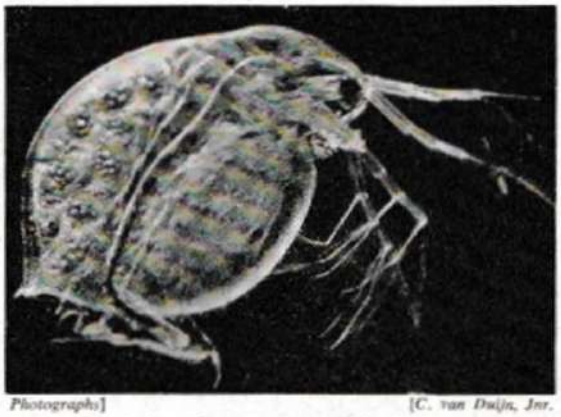
Daphnia and *Cyclops*

Detailed Description of their Anatomy, Feeding and Reproduction

By C. van Duijn, Jnr., A.M.Tech.I. (Gt. Britain), F.R.M.S.

THE importance of "Water Fleas" as a livefood for fish is generally realised but the natural history of these creatures is less well known —even amongst aquarists— although it is very interesting. For studying "Water Fleas", the cheapest form of microscope will suffice, since generally no higher magnifications than about 20-50 times are required for revealing their anatomy completely and these magnifications are sufficient for observation of the much smaller young stages, the so-called nauplii.

The popular name "Water Fleas" has been given to these organisms and their characteristic movement shows some resemblance to the hopping of a common flea. In addition, there is some colour affinity. But further than this there is no relation whatsoever between real fleas and the "Water Flea" or *Daphnia* ! *Daphnia* are Crustaceans and are therefore related to crabs and lobsters, whilst real fleas are insects.



Photographs] [*C. van Duijn, Jnr.*

Female Daphnia *with ova in an early development stage.*

If we observe a *Daphnia* under the microscope our attention will be drawn first to the large forked antennæ at the head, which are used for locomotion. In the head, a facet eye is clearly visible. This eye may be turned in several directions by means of small muscles which are attached to it. If we watch it carefully, we will see a sudden trembling movement sometimes, which we could interpret, somewhat imaginatively, as winking ! Of course, a "Water Flea" cannot wink in reality for it does not possess eye-lids.

Apart from the large facet eye, a *Daphnia* has another eye of much smaller size, situated further inside. This small eye is not a compound one. It remains from the larval stage.

In the middle of the body we see the intestine, which will generally appear of a dark colour, owing to its contents. The colour of the contents may vary from black or brown to greenish, the latter colour predominating after the little animal has consumed a good meal of unicellular Green algæ.

Male Daphnia longispina *Magnif.* × *approx.* 16.

At the upper side of the intestine the liver may be noticed, while in the neighbourhood of this organ the scale gland is situated. As its name indicates, this gland serves for producing the chitin scale which surrounds the whole body except the head. The scale has a ginglymus (a turning joint) at the dorsal side, so that it may be opened at the ventral aspect, thus enabling the intestine to excrete the undigested parts of the food to the outside, while the young "Water Fleas" may leave the body of their mother in the same manner.

At the ventral side of the intestine a number of legs will be visible. A real *Daphnia* has five pairs of them, but in other Genera, e.g. *Diaphanosoma*, there may be a different number. The legs do not serve for locomotion and their most important task is as breathing organs. For this purpose every leg has a built-in gill.

The reproductive organs are situated at the dorsal side of the intestine. In the female the ovaries lie against the intestine, while in the male the testis occupies the same place. In the female, an oviduct goes from the ovaries to an open space where the ova are deposited. The ova remain in this brooding space during their whole development. Hatching of the young also takes place in the body of the mother.

At the upper side of the brooding space of the female, or at the upper side of the testis in the male, the lively-beating heart may be seen. A "Water Flea" does not possess blood vessels; the colourless blood streams freely through the body cavity, propelled by the heart. Thus, all internal organs are embedded in a continuous stream of blood from which they may take the necessary oxygen and feeding substances whilst, in addition, carbon dioxide can be removed from the tissues.

Ephippium of a Daphnia *containing two eggs.* (*Magnif.* × 36)

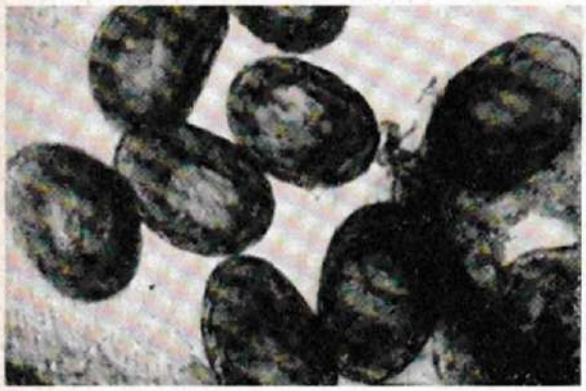
A remarkable fact to be noted about *Daphnia* is that at most times of the year only *females* may be collected. This is due to the particular reproductive cycle of these organisms. "Water Fleas" are able to reproduce parthenogenetically, i.e. by means of females only. Females develop ova which do not require fertilisation for their production and their development takes place in the brooding space. The young will hatch in the brooding space and remain there for a short period, after which they are moved to the outside by active movements of the mother, assisted by antennæ movement of the young themselves. One of the accompanying photomicrographs shows a young "Water Flea" at the moment it is leaving its mother's body. I consider myself very fortunate to have been able to photograph this particular moment of emerging.

The above-mentioned ova, which do not require fertilisation, are distinguished from other kinds by the name subitane ova, derived from a Latin word meaning "unexpected", indicating that this reproduction phenomenon was completely un-

expected at the time it was discovered. The young "Water Fleas" are called nauplii (plural of nauplius) as is also the case with young of other Crustaceans. The nauplii of the "Water Flea" differ in several respects from their parents. The facet eye is still absent and they possess only 3 pairs of legs. Their antennæ are also of a simpler structure. After some changes of scale there comes a greater resemblance until at last they will have reached the adult form.

The nauplii, produced by the asexual method, are generally all females, which will reproduce themselves in the same way. This reproduction cycle continues as long as external conditions are favourable and all this time no males will be found. But if conditions become adverse, i.e. owing to great cold in winter or abnormal heat in summer, a generation consisting of both males and females will appear. Then the females produce a different kind of ova, which does require fertilisation for development. These ova are generally called "winter eggs" because they are produced largely in winter, this being generally the season in which unfavourable conditions prevail. But, as has been stated previously, the occurrence of "winter eggs" is not restricted to the winter season; they will be found whenever conditions are bad and therefore they may sometimes occur more abundantly in a hot summer than in an average winter.

While subitane ova are always produced in greater numbers in each female, the number of winter eggs is small, being only two or three in every individual. The winter eggs



Subitane ova of Daphnia *in the brooding space,* ×*approx.* 90.

are enclosed conjunctively in a hard scale, which has been named ephippium (after a Greek word, meaning "saddle") with respect to the particular shape, resembling the saddle of a horse.

Death of the Female

After a certain stage of development of the ephippium has been reached, the female dies and its dead body sinks to the bottom of the water, where it will decay, so that the ephippium is set free. The eggs remain in a resting stage until external conditions become favourable again and then the embryos develop so that in due course a new generation appears. This new generation consists entirely of females, which will reproduce asexually until other bad circumstances start the sexual cycle again.

The ephippia show extraordinary resistance to all kinds of bad influences.cold and h They can resist great eat and dehydration. Theyore resis are also much mtant to

Birth of a "Water Flea". The young Daphnia *can be seen emerging from the mother creature's body.*

chemicals than "Water Fleas" themselves. Upon boiling with strong hydrochloric acid the ephippia do not seem to undergo any visible change, although it is doubtful whether they would still be able to hatch after this treatment !

Now we know these particulars about the life cycle of "Water Fleas" we can see the reason why they may suddenly disappear from a ditch or pool, where they were once abundant, while after some time they will reappear as if by magic.

After having dealt with the anatomy and reproduction of *Daphnia* we can go into another interesting phenomenon, namely that of cyclomorphism. By this term is meant a periodical change of shape (morphological cycle). The general shape of the body, and especially that of the head, may vary with the season of the year. Thorough investigations have revealed that this particular behaviour depends on small changes in specific gravity of the water with rising or falling temperature. The little animals remain hovering in the water mainly by their antennæ movement, but they are aided in this by the upward force of the water and also by the friction forces between their body and the water. The first force depends on the specific gravity of the water and on the volume of the body, while the second depends on the surface area of the body and the viscosity of the water. Both viscosity and specific gravity decrease with increasing temperature, consequently the upward forces would become less unless they were balanced by a change in the shape of the animal, as actually occurs.

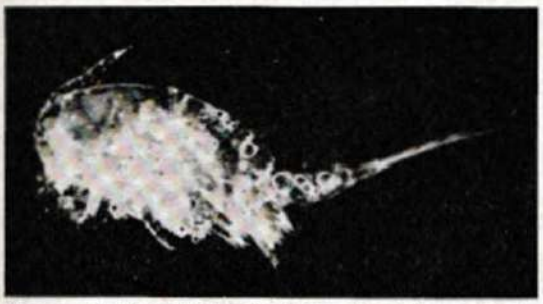
Adjustment of Body Shape

Since the changes in water temperature take place gradually over the whole year, the animals adapt their body shape gradually to meet these. Thus they are not hampered in maintaining their hovering power almost constant the whole year round. Such cyclomorphism may also be noticed in a number of tiny creatures living in the water, such as Rotifers and others.

Daphnia feed on unicellular algæ, protozoans and also on non-living organic matter, so far as it is suitable for digestion. Owing to this, they may be used to good advantage for cleaning a tank or pond, where the water has turned green as a result of abundant growth of unicellular algæ. Introduction to a tank with small fry is to be avoided, for, if the young fishes are still unable to eat them, the "Water Fleas" will consume the infusorians on which the fry depend, thereby causing starvation of the young fish.

Alona testudinaria, *a species of "Water Flea" related to* Daphnia *and* Cyclops. *Note the dark eye. Magnif.* ×150.

A further kind of small Crustacean may be described in this article, although it belongs to another Family and is not a true "Water Flea". I refer to *Cyclops*



Above: side view of a male Cyclops. *Magnif.* × *approx.* 48. *Right: a* Cyclops *nauplius,* × *approx.* 75. *Both photographs and those of* Alona *and an entire female* Daphnia *taken by means of dark-ground illumination.*

and its relatives which are often associated with *Daphnia* in pools and ditches and play an important role as a livefood for fish. *Cyclops* may also be found in waters where *Daphnia* do not occur. They can be found the whole year round, but seem to be more abundant in Spring.

Organs of Locomotion

Cyclops, like *Daphnia*, has two antennæ for locomotion, but they are of a much simpler structure. The legs are also situated at the belly and serve for breathing but, apart from this, they are also used for capturing small food animals. Some species have a red eye, which shows itself in a very beautiful way when dark-ground illumination is used.

Cyclops does not show such an interesting life cycle as *Daphnia*, only one kind of egg is produced and it requires fertilization. Therefore males and females will always occur at the same time. The female carries the eggs in two small receptacles or egg sacs attached to its abdomen. Some related types possess only one egg sac, e.g. *Diaptomus*.

The young *Cyclops* differ much more from their parents than young *Daphnia* do so they have to pass through a more intricate process of metamorphosis. The photograph in this column shows a *Cyclops* nauplius. From this photograph it is obvious that we could mistake the animal for a quite different creature if we were not aware of its eventual development into an adult *Cyclops*.

The heart of *Cyclops* lies at its back, but it cannot be observed as easily as in *Daphnia*. The intestine, however, is generally clearly visible. Near the sides of the intestine there are often a large number of fat droplets; these show themselves as small, yellowish drops. From this observation we may conclude that *Cyclops* is a highly nutritious food for fish

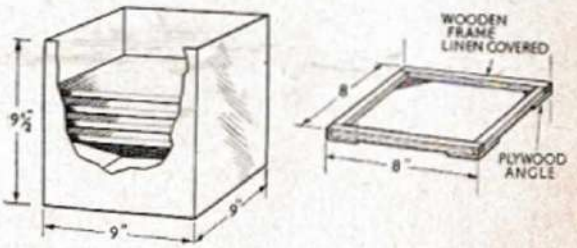
Transporting *Daphnia*

Converting a Biscuit Tin into a Useful Container

By F. R. Tilley

HAVING experienced the difficulty of transporting *Daphnia* from pond to home, and arriving tired from carrying a large can of water, then disappointed on finding half of the *Daphnia* dead, I decided the time had arrived to experiment. I used a small biscuit tin, complete with lid, and a bundle of lichen moss. The moss was soaked on arrival at the pond and then a quantity of it was laid in the tin. *Daphnia* were collected and sprinkled as evenly as possible over the moss. Then another layer of *Daphnia* was added and so on until the tin was full. On arriving home the contents were placed in a tank and I was very pleased to discover that all the *Daphnia* were alive. However, I found that every time I wanted to feed my fish, I had difficulty in separating the *Daphnia* from the moss.

I experimented again and obtained a deeper biscuit tin and several lengths of ¼ in.-square wood. With the wood I made 12 square frames, ⅛ in. smaller all round than the inside of the tin. On to each frame I tacked a square of linen (an old sheet is quite suitable). Plywood angles were used to keep the trays apart but I have since proved that these are not absolutely necessary. A layer of wet cotton wool in the bottom of the tin helps to maintain a moist atmosphere.



Left: exploded diagram to show the position of the trays within the tin. Right: construction of a wooden frame.

One tray at a time was floated near the edge of the pond when *Daphnia* were collected. The *Daphnia* were placed on the tray and they soon sorted themselves out much better than when packed in moss. I found by further experiments that this method was by far the best and the linen stayed damp for several hours.

Although this latter type of container is more expensive to make, the weight of the contents is 75 per cent less than that of customary water and can. In addition all the *Daphnia* are alive on reaching one's destination.

Finnage of Fancy Goldfish

(*Continued from page 257.*)

tendencies which, as regards the length of man's memory, are reliable and to use these judiciously is all that the most interested breeder of animals can do. Obviously, if we desire to do something then we must have some plan or system of work. That some oversight or weakness in the plan occasioned by our lack of knowledge as to the true nature of the forces at work prevents our immediate understanding is probably something to be thankful for, since the pleasure in these matters lies in the very difficulties and uncertainties which we are trying to overcome.

Fishes of the Genus *Mollie*

Six Species

By Alwyne C. Wheeler and Raymond W.

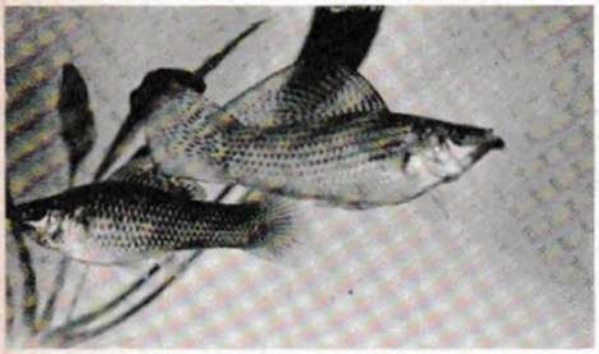
Male of the black variety of Mollienesia latipinna.

Photograph by G. J. M. Timmerman

SINCE 1945 the ban on the importation of live animals, including fish, has been considerably relaxed, and many uncommon species, from the Old and New Worlds, are now available. A number of fish have appeared that are new to the aquarist as well as some new to science. Amongst these are many relatives of well-known aquarium fish which are not readily recognised.

To give the aquarist some guide in identifying the more unfamiliar aquarium members, this brief sketch of the Genus *Mollienesia* is made. It does not claim to be a comprehensive review, but is, rather, a collection of the scattered literature on the subject.

The Genus *Mollienesia* belongs to the *Microcyprini*



Photograph] [*G. J. M. Timmerman*

Female and male M. latipinna. *Note that the dorsal fin does not commence until well behind the gill covers.*

(Tooth-carps) an Order that includes many fishes known to the aquarist. It is the Family *Poeciliidæ* that enjoys most popularity for to it belong such fish as *Lebistes* (Guppies), *Xiphophorus* (Swordtails and Platies) and the Genus *Mollienesia*. All are ovoviviparous (livebearing) fish, found in the Southern United States, Central America, and the northern part of South America. In all members of this Family the anal fin of the male is modified as an intromittent organ (gonopodium). This fact is of great importance to the expert ichthyologist when classifying the different Genera.

Of the Genus *Mollienesia* many species have been described, and of these *M. sphenops* and *M. latipinna* particularly have been divided into numerous sub-species. In the wild the variation in these two species is great. Many populations confined to streams and lakes have evolved distinct races from that of the "typical" form. The precise identification of these natural sub-species is of little importance to the aquarist. Needless to say the varieties found in the wild must not be confused with the "man-made" ones; the latter are largely the result of breeding from "sports" or of hybridising two species. It seems likely that all the known species of *Mollienesia* can be kept in the aquarium, but those which are abundant in the wild have become better known to the aquarist.

The list of aquarium species is short and includes *M. sphenops*, *M. latipunctata*, *M. petenensis*, *M. velifera*, *M. latipinna*, and the so-called '*M. formosa*'. *M. dominicensis*, a species confined to the mountain streams of San Domingo and Haiti, was collected by Herr Roloff in 1937. Presumably it was introduced into Europe, but nothing has been seen of it as an aquarium fish. Aquarists will do well to look out for it, as the species may have been introduced in recent importations.

Sketch-map showing the

The whole Genus *Mollienesia* can be divided into two distinct groups, the short-fin and the sailfin species. To the first group belong *M. sphenops* and the rarer *M. latipunctata*. All the short-fin species have between 8-10 (occasionally 11) rays in the dorsal fin, whilst those of the sailfin group, *M. velifera*, *M. petenensis*, *M. laitpinna*, and '*M. formosa*' have between 11 and 18 dorsal rays. Nineteen rays have been recorded for certain specimens of the sailfin group but this is due in some instances to the last ray splitting into two.

Mollienesia sphenops (Common or Shortfin Mollie) was first given its name by a great French ichthyologist, Baron Cuvier, who, in 1845, obtained large numbers of specimens from Vera Cruz. The species, where found, is very abundant. It is also very variable; the olive brown back and lighter belly are often covered with black markings of some sort. These may vary from a few spots and blotches to a reticulated pattern covering both fins and body (the perfect black melanistic form is occasionally found in the wild, and it is from this sport that the black aquarium *M. sphenops* has been derived.) The females are usually more drab than the males and the markings are often less distinct.

Two aquarium varieties worth mentioning are the Red-tailed Mollie and the Liberty Mollie. Both were developed in America. The former appeared about 1934 when specimens from Yucatan were sent to W. T. Innes. There are variegated and blue strains of this variety, but the colour of the fins is generally the same. The male fish has the centre of the caudal deep black, contrasted by an orange margin that is confined to the edge of the fin. A reddish hue around the operculum can sometimes be seen in daylight. This

*The authors of the above paper who, it will be noted, have consistently used the *Mollienesia* spelling, point out that in the 1821 Journal of the Academy of Natural Sciences, Philadelphia, where the original text on Mollies by Le Sueur is published, there is a number of mis-spellings and the ending of the Generic name appears in three places as *-esia* and in one as *-isia*. This information was also given by Reeve M. Bailey and Robert Rush Miller, in *Copeia* 1950, No. 4, December 22, p. 318. In view of the fact that in the first text mention of the Genus in the 1821 Journal (at the head of a page and in bold type) the ending is given as *-esia*, it is proposed to employ the *Mollienesia* spelling in future in WATER LIFE.

ienesia*

es with their Colour Varieties and Hybrids

W. ngle

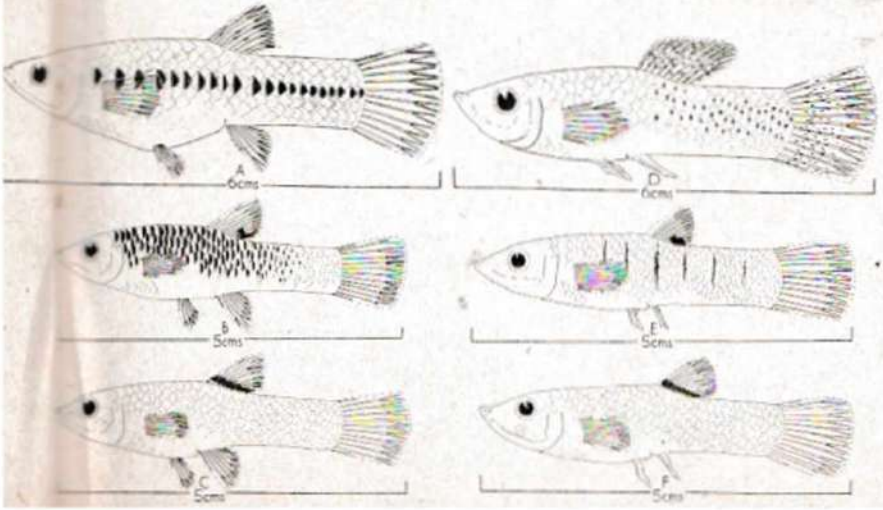
coloration is usually absent in the female fish.

The rather spectacular colour of the Liberty Mollie is again best seen in the male fish. The dorsal is bright red with longitudinal rows of black spots or blotches, below which is a large row of yellow blotches. In contrast, the base of the dorsal is deep black. The caudal takes the same pattern as the dorsal but is without the yellow markings. The Federation of British Aquatic Societies' show standard for the variety calls for dorsal and caudal fins the inner thirds of which are black, and the remainder yellow ground overlaid in the outer third with red. The female fish is again of a drab colour, but often shows an iridescent blue streak on the belly.

the distribution of Mollie species.

M. latipunctata is as limited in its distribution as *M. sphenops* is widespread. It seems only to occur in the Rio Tamesi and its tributaries, a river north of Tampico, Mexico, and was first recognised by Dr. Seth Meek who described it from specimens obtained in May 1903. He called it, however, *Poecilia latipunctata* and only in later years was it placed in the Genus *Mollienesia*.

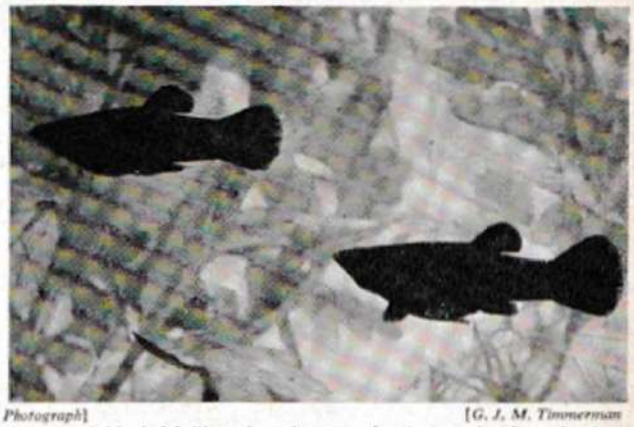
There are several characters that distinguish *M. latipunctata* from *M. sphenops*. The female has a longitudinal row of black spots, each about the size of the eye, along the sides of the body. These are smaller in the male and are scattered over the hind portion of the body, dorsal and caudal fins. These spots are not so obvious in the corresponding fins of the female. It is of interest to note that this species was introduced as an aquarium fish into America about 1930 and seems to be popular there. British aquariums appear to lack this species, but it may have been introduced into this country unbeknown since the war years.



THREE SHORT-FIN SPECIES.

A .. .. M. latipunctata *female*.
B .. .. M. dominicensis *female*.
C .. .. M. sphenops *female*.
D .. .. M. latipunctata *male*.
E .. .. M. dominicensis *male*.
F .. .. M. sphenops *male*.

All drawings illustrating this article by R. W. Ingle.



Photograph [*G. J. M. Timmerman*

A pair of black Mollienesia sphenops *showing good colour density.*

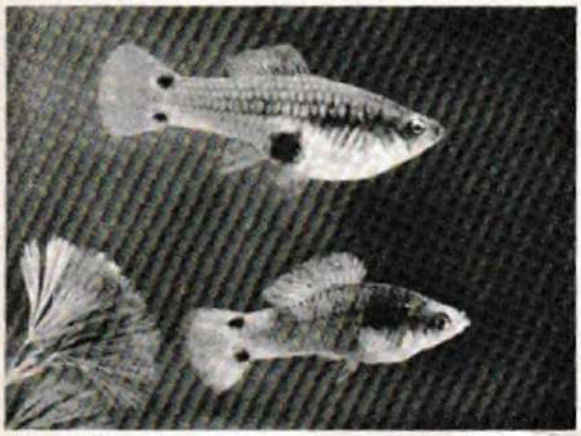
Of the sailfin Mollies, *M. velifera* is probably the most sought after. It is more robust and larger than its relative *M. latipinna* and the male's magnificent dorsal fin, which begins over the head and reaches nearly to the base of the caudal, is marked with dark ringed spots. The dorsal of the female commences just behind the base of the pectorals and is not so long as the male's. *M. velifera* lives on the Yucatan Peninsula, where it was first collected in 1910 by Herr J. Paul Arnold, a Hamburg aquarist. Generally it does not appear to be a common fish, and only occurs in moderate numbers in certain localities. Worthy of mention is the uncommon melanistic wild form, known to the aquarist as the Black Sailfin.

Discovery of "Spike-tailed" Species

A fish named the "spike-tailed" Mollie made its appearance in American aquariums about 1938; but specimens were first made known to science as early as 1861-62. Its introduction to the aquarist was through W. T. Innes, and in a 1938 issue of *The Aquarium* he briefly described this species as the "Spike-tailed Mollienisia." The fish was none other than *M. petenensis* confined to Lake Peten in Guatemala. The name "spike-tail" is given due to the fact that the male fish has the last few rays of the lower edge of the caudal fin darkly coloured, giving the impression of a developing spike or sword. This is absent in the female which is very difficult to distinguish from *M. latipinna*. There appear to be no records of *M. petenensis* ever having reached British aquarists but, again, specimens may have arrived in recent importations.

M. latipinna is undoubtedly the best known sailfin, and is also the most variable. Some sub-species are small and have poorly-developed fins, whilst the salt-water races of Key West, Florida, have fins comparable with those of *M. velifera*, with which they are easily confused. *M. latipinna* has fewer rays in the dorsal, which begins further back on the head, and which

(*Continued next page.*)



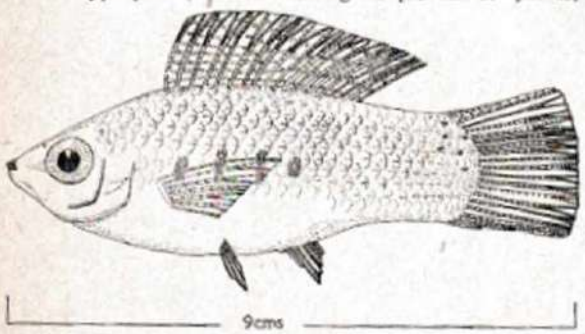
Photograph] [*G. J. Timmerman*

Male and female 'M. formosa'. *This fish is actually a hybrid between* M. latipinna *and* M. sphenops.

makes it appear somewhat shorter than that of *M. velifera*. Besides being the best known sailfin, this species has a historical interest as it was the first *Mollienesia* ever to be described. It is to Le Sueur that we owe the name *Mollienesia*. He recognised in the specimens sent to him a new Genus of fish, and named them after his friend Monsieur Mollien, one of Napoleon's ministers of finance.

There are numerous "man-made" varieties of *M. latipinna*. The pure black sailfin is the most popular. Black or partly-black specimens are sometimes found in the wild, especially in saline conditions. By careful interbreeding of these melanistic forms the pure black *M. latipinna* is obtained. They are, however, apt to be rather small and average about 3 in. A recognised variety of this form is the Orange-banded Sailfin. This fish has an orange band along the top margin of the dorsal that was said to be obtained by breeding Sailfins in an outdoor pool. The most popular variety of *M. latipinna* is the Perma-black and this is a hybrid between *M. latipinna* and *M. velifera*. The small size and poor development of black *M. latipinna* is overcome by crossing it with black *M. velifera*. The progeny have the staple blackness of the former, and the well-developed fins and size of the latter species.

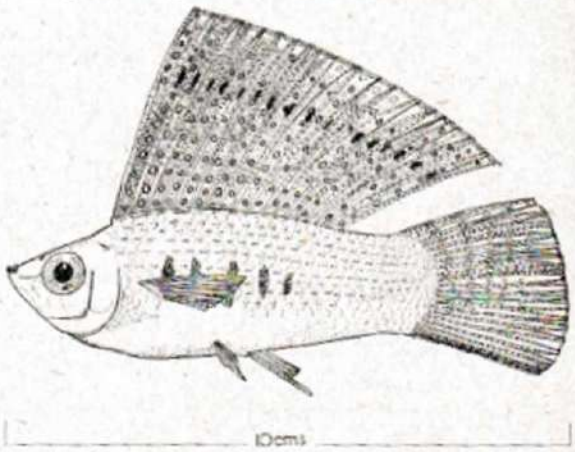
It is appropriate, when discussing the question of hybrids,



Female M. velifera. *The dorsal starts just behind the gills.*

to mention the last of the aquarium Mollies, the so-called '*M. formosa*'. This species was described by Dr. Girard of Philadelphia in 1859 from specimens collected in the lagoon at Paolo Alto. For many years it was believed to be a valid species, until in 1930 the eminent American ichthyologist, Dr. Carl Hubbs, brought to light the fact that no male '*M. formosa*' was available as a preserved specimen. He later showed that '*M. formosa*' possessed characters of both *M. sphenops* and *M. latipinna* and that it was a hybrid between these two species. This was confirmed by inducing the two species to breed together in the aquarium, thus producing an '*M. formosa*' hybrid resembling those found in the wild state. It is only when *M. sphenops* and *M. latipinna* are found together that they interbreed and produce '*M. formosa*' of both sexes. Throughout the rest of its geographical range '*M. formosa*' is represented only by females.

For some time scientists were puzzled by this peculiar situation, and it was only extensive experiments that gave something like the answer. In the laboratory *M. sphenops* and *M. laitpinna* crosses produce '*M. formosa*' of both sexes. The male fish are often poor specimens and sometimes die before reaching maturity. If the hybrid females are back crossed with either *M. sphenops* or *M. latipinna* males the offspring are all female '*M. formosa*'. This condition persists in all crosses of this type, and it appears that in the wild state '*M. formosa*' reproduces by continually interfreeding with male *M. latipinna* in the northern areas and with male *M. sphenops* in the southern range but, where the two species interbreed, '*M. formosa*' of both sexes are found. This phenomenon has been attributed to a genetical abnormality, the details of which are outside the scope of this article. Briefly it is believed that in the cross of *M. sphenops* and *M. latipinna* the hybrid '*M. formosa*' accumulates an amount



Male M. velifera. *Dorsal starts just over the gills.*

of "foreign" protoplasm. When back-crossed with males of either species the spermatozoa induce the ova to commence development but are unable to have any paternal effect in sex determination.

(To be continued.)

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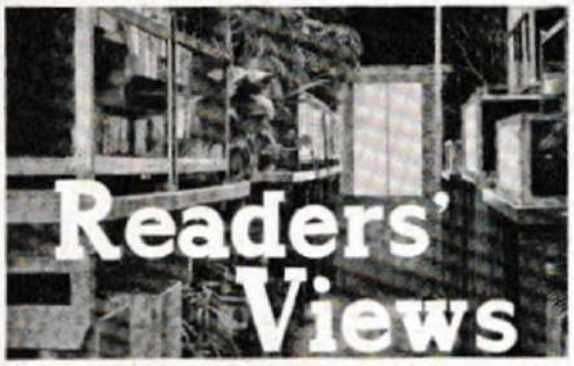


The Editor is not responsible for opinions expressed by correspondents

F.B.A.S. JUDGES' CONFERENCE

SIR,—You mentioned my views on rockwork in furnished aquaria in your report of the 1953 Judges' Conference and I also note that you enlarged on them in your feature "In and Around the Aquaria World" (WATER LIFE, June, 1953). Mr. Webley referred to the same subject in your last issue.

I feel that far too little trouble is taken to obtain really attractive rockwork for the competitive furnished aquaria. It has been said recently in high judging circles that there is a singular lack of originality in tank layout, a trend towards uniformity of design which seeks to follow the pattern of previous winners. Surely the use of well-chosen rockwork tastefully and convincingly arranged is almost the only manner in which we may achieve an original layout without, of course, entering into the realm of surrealism where general impracticability far outweighs artistic merit.

Really beautiful rocks are almost never just picked up. To begin with one must go to the right places but even on our rugged coastline and upon the mountains it is rare indeed that one can "turn aside and knock off one of the many superfluous knobs and excrescences". Invariably the choicest pieces, those combining the most pleasing qualities of shape, tone and texture, are to be found only in the most inaccessible places or embedded in solid rock masses, possibly requiring an hour or more of careful cutting with hammer and cold chisel to remove intact, to say nothing of the miles they may have to be carried in a rucsac and a final trimming to suit the layout.

The acquisition of such rockwork establishes a fascinating sideline to the hobby of fishkeeping and the collector may come to regard such hard won exhibits as truly "precious stones", each one a lasting testimony of happy hours spent collecting in the remote coastal areas in the south of England, Wales, or Ireland and in the mountains of the Lake District and Scotland.

Blackpool. R. E. LEGGE

LOSSES AT MANCHESTER

SIR,—In your report of the British Aquarists' Festival held at Manchester you mention four societies outside the Federation of Northern Aquarium Societies who had success there.

Have you overlooked the fact that my society made 18 entries and, in one class alone, Lowersword Guppies, took all the awards? Incidentally, all but five of our 18 entries were lost yet you did not mention that fact in your report. How did these fish disappear?

I was unable to ascertain the reason for their loss when at the end of the show the time came to take the exhibits away. It would be interesting to have an explanation from the organisers of the event.

Cheltenham.

F. E. COX
Member, F.G.B.S.
(Cheltenham and Gloucester Section).

ANATOMICAL ANALYSIS

SIR,—In his interesting discourse on "Aquarists of the World" (WATER LIFE, Aug.-Sept. 1953) David G. Dixon gets the anatomy of our hobby wrong and leaves it incomplete.

Something more than a backbone is necessary, and the "quiet, unassuming, silent" aquarists are the flesh and blood of the hobby, not the backbone.

The skeletal support consists of the Federations, Associations, Societies and the Press. The muscles and sinews, giving movement to the mass, are provided by the Chairmen, Secretaries, Committees and Show Organisers—usually drawn from Mr. Dixon's "technicians".

Because time at society meetings and space limitations in the Press do not permit long recitals of the many points of agreement, expressions of disagreement are apt to appear disproportionate, but there is still much more harmony than discord.

Great Barr, W. L. MANDEVILLE
Birmingham.

SPONTANEOUS PARTHENOGENESIS

SIR,—I have followed with interest the opinions expressed in your columns about Dr. Helen Spurway's account of Guppies produced without apparent fertilisation. Complementary to Mr. A. G. Birch's views (WATER LIFE, August 1953, p. 224) I suggest that the original report (NATURE, March 7, 1953) gives insufficient details to allow us to come to any real conclusions.

Before we can be satisfied that what happened has been correctly interpreted we need to be told the exact conditions under which the specimens were kept, what equipment was employed, how many people were in charge of the fishes and the methods used when feeding and for transferring the fish from one container to another.

Why was it that there were no signs of gonopodial development until 51 days had elapsed? Guppy breeders do not normally leave the first sexing of their stock after 28 days. Why did the D.9 female hold her young until such a mature age? Generally, a female will drop her young at four months if fertilised at an early date. Is it possible that any of the females had been fertilised by the introduction of male sperm through the medium of the same net or nets used in tanks accommodating males and females separately? Was any water in a tank or tanks containing males transferred to the tank or tanks reserved for females?

Should Dr. Spurway want to make further attempts to prove that spontaneous parthenogenesis is possible, I feel certain that to help her with her experiments members of the F.G.B.S. would supply her with females that have been sexed at an early age.

Leicester. H. ESTERBOOK
East Midlands G.B.S.

NOT BARBUS MAHECOLA?

SIR,—The reference in your August-September issue to a fish termed *Barbus mahecola*, said to be common in India and Ceylon, together with an illustration and description of the young fish, confirms this fish to be the "Black-spot", a well-known light sporting fish of India and Ceylon, correctly named *Barbus filamentosus*.

Barbus (*Puntius*) *filamentosus* (Cuvier and Valenciennes) is well described in Day's "Fishes of British India", and the confusion has arisen because of the sexual differences of the adult fish. In "Records of the Indian Museum," XXXIX p. 22 (1937) and again in the same Journal XLIII p. 245 (1941) Hora points out that *Barbus mahecola* is actually the female *Barbus filamentosus* and not a separate species.

This Barb is very common in many parts of Ceylon, but is at its very best in Kandy Lake, in the central hill country, where it is the predominating fish. Adults attain a length of over 8 inches, the females being somewhat heavier and larger than the males. Externally the differences are very marked. The male is brighter coloured than the female and slimmer of body. His dorsal fin is bluish black and from 6 to 8 filaments grow out of its rays somewhat resembling the caudal filaments of *Belontia signata*. These do not appear till the third year when the fish is 5 inches long.

The dorsal part of the body is brownish green, shading to a mellow emerald green which is very attractive indeed; this colour gives way to yellow which finally fades to white on the belly. At breeding time the belly is suffused with light pink. The tail fin, at breeding time, is reddish, ordinarily it is amber coloured. At the tail base is an ovoid black splotch lying along the length of the lateral line, this spot giving it its popular name of "Black-spot".

I am glad this fish has reached the aquarium world. For years I have kept it and have collected specimens all over Ceylon where, in its adolescent stages, it has been incorrectly called *Barbus sinhala*.

RODNEY JONKLAAS
Zoological Gardens of Ceylon.

Dehiwala,
Ceylon.

(Further notes by Mr. Jonklaas on *B. filamentosus* will be published in our next issue. It is regretted that a number of interesting letters have had to be held over owing to lack of space.—Ed.)

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.

Sink Used as a Pond

I have a sink set up in the garden measuring approximately 4 ft. × 2 ft. It contains quite a lot of plant life, including a small lily. I have been feeding the six fish once a week on dried food. Last week I found two of the fish dead and there seemed to be a lot of stale food on the bottom.—(Mrs. D.C., Streatham, London, S.W.16.)

You do not say how deep your sink is, but if it is, in fact, a sink the capacity will be less than 50 gallons and more likely 20 gallons. This is really very small for an outdoor pond and would be affected by wide fluctuation in temperature. Four fish would certainly be the limit. As for feeding, you are definitely doing this in excess. A pinch of dried food once a week, and say one tiny Earthworm per fish twice a week, should be all the fish require. During the cold weather they will not need any food at all. The sink will require cleaning out in the Autumn and Spring.

Survival of Plants During an Absence

I am going away for a fortnight and wonder whether the plants in my tropical aquarium will survive if no artificial light is supplied during that period. The tank receives very little daylight. I am not worried about the fish as they are being well fed on livefood beforehand.—(G.F.C., London, N.W.6).

If your plants are in good condition and growing vigorously, they should survive without any artificial light, although they may look a bit sickly by the time you return. However, they should not be dead and will soon revive, particularly if the amount of light is increased for a short while. You could, of course, wire the lights up with the thermostat so that when the heater is on the lights are as well. There would then be periods of light and dark. It would be as well to make certain that such an arrangement would not cause concern amongst neighbours who might see the lights go on and off at unusual times.

Hyphessobrycon rosaceus

How may I induce Hyphessobrycon rosaceus *to breed?—(A.E., Stockton-on-Tees).*

Hyphessobrycon rosaceus is not one of the easiest fishes to propagate but it has been bred on a number of occasions. The males and females should be separated three or four weeks before it is proposed to attempt to spawn them. During this time they must be fed well on nourishing food for it is essential that both should be in tip-top condition, especially the male. Prepare a fairly large tank with a good thicket of fine-leafed plants, such as *Myriophyllum* or *Nitella*, in a partly shaded position (a little sunlight does no harm during spawning, but the tank should be shaded as soon as it is over). Desirable temperature is 78-80 deg. F., the water should be fresh but seasoned, and the base of the tank free from mulm. When the fish are in condition, place the male (some breeders use two males to one female) in the breeding tank two or three days before the female. The transfers are best done at night. If the fish are in condition, chasing will soon start and the male will entice the female into the plant thicket where about ten semi-adhesive eggs will be dropped. This will be repeated a number of times. The fish should be removed immediately after conclusion of the spawning. The eggs have a tendency to develop Fungus, hence the need for fresh water, but if all goes well they will hatch in about two days and the fry will become free swimming a few days later, when they should be fed on fine Infusoria. As the young fish grow, they should be given Rotifers, sifted *Daphnia* and small feeds of Brine Shrimps. It has been suggested that the salt from heavy feeding of Brine Shrimps affects the spawning capacity. Later they may be given Mikro-worms, chopped White Worms and some dried food. The males can be identified by the pointed dorsal fin, whereas the females have a red tip above a white edging to the dorsal fin.

Hatching Snake Eggs

An imported Italian Grass Snake recently produced three eggs. How may I tell whether they are fertile and what care would they need to encourage hatching?—(O.J., Ilford, Essex).

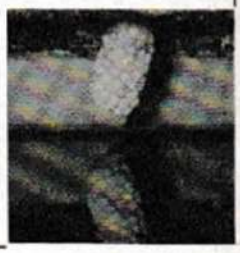
These Italian Grass Snake eggs could be fertile but we know of no way of telling this. They should be incubated in a perforated tin containing some moss (which is kept slightly damp) in warm surroundings of about 80 deg.F. Grass Snake eggs in this country are often laid in manure piles during September and take, on an average, ten weeks to hatch. The question of food for baby Grass Snakes is still something of a mystery. Some authorities believe that they do not feed until the following year and then on tadpoles, insects or baby frogs and toads. Snakes do not require much room in captivity.

Requirements of Infusoria Snails

Can you give me some information on the general management and breeding of Infusoria Snails (Ampullaria)*?—(W.W., Portsmouth).*

The best way to keep *Ampullaria* snails is to place them singly in half-gallon jars or small aquariums, feeding as much lettuce as they will eat. In about five days, with a temperature about 65 to 70 deg.F., the jars should contain good cultures of Infusoria ready for feeding to young fish fry. About once a week, two-thirds of the culture should be thrown away and replaced with fresh water. If this is not done the cultures may become foul, smelly and useless. Aeration will help to prevent this happening. Any old useless plants can also be added to the cultures as the snails are avid vegetable eaters although they have been known to eat *Daphnia* as well.

Their shells should feel slightly springy but they are easily damaged if dropped on a hard surface. In order to keep their shells in good condition it is essential that the snails be kept in alkaline water. Several inches should be left between the surface of the water and the top of the container since these snails lay their eggs above the water surface. A large cluster of eggs is laid and in about a fortnight the eggs hatch and the young snails fall into the water. A cover should be placed over the container to prevent the snails from climbing out. *Ampularia* snails can breathe atmospheric air and can therefore live in conditions that have become quite foul. These snails, with the exception of *A. cuprina*, should not be placed in a furnished aquarium, as they will soon strip it of plants. *A. cuprina*, on the other hand, is a good seavenger living on dead or decaying plants, algæ, dead fish, dead *Daphnia* and various livefoods. The eggs of this snail are white, whereas those of the others are red.



The adult Ampullaria *snail is shown on the left. Right is a cluster of* Ampullaria *snail's eggs laid above the water surface. When the eggs hatch the young snails drop back into the water.*

Photographs] [*G. J. M. Timmerman*

WATER ANALYSIS

Samples should be sent in a clean pint bottle, well packed, 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 F.H., London, S.E.27. It had been drawn from a well by means of a pump and it was wondered whether the water was suitable for filling a pond.

Test for impurities:— Appearance: clear. Odour: none. Total mineral content: not possible to determine. Organic matter: sample too small for determination. Nitrogen compounds: 0.000008 per cent, satisfactory. Ammonium compounds: 0.000002 per cent, satisfactory. Poisonous metals: none detected. *p*H: 8.1, satisfactory. Chlorine, as salt: 0.005 per cent, satisfactory.

Suggested corrections:— The results obtained from the chemical analysis of this sample of well water reveal that it is a pure and very suitable supply for a pond.

In and Around the Aquaria World

— By W. J. Page —

SOCIETIES affiliated to the Association of S. London Aquarist Societies gave good support to the annual interclub show held at Sutton. A.S.L.A.S. judges placed the awards. Kingston A.S. gained most points (72), followed by Mitcham A.S. (54) and Sutton and Cheam A.S. (31). Present at the prizegiving, I was pleased to note that as many as twenty-two societies were participating in this event.

* * *

AFTER much thought and organisation, behind the scenes, the Aquatic Traders Association has introduced a "gold seal" scheme in its attempt to guarantee the quality of the articles marketed by its members. The plan is to invite manufacturers to have their apparatus tested by an independent panel of examiners and if of an acceptable grade to award the article a gold seal. If the scheme works aquarists will know that articles bearing the seal are considered reliable by the examining panel.

* * *

DETAILS are given on page 277 of the insurance scheme adopted by the F.B.A.S. and which has been devised by the Union Assurance Society Ltd. Mr. G. H. Jackson, of the company, has explained to me in detail how it works. One thing that should be made clear, I think, is that aquarists wanting cover but possessing more than five tanks should not be put off by the fact that the rates for their collections are not quoted in advance on the proposal form. There are good reasons for this. Firstly, it keeps the scheme simple and easy to operate for owners of not more than five tanks whose risk the Company can visualise. Secondly, it is felt that amongst owners of larger collections there is more variety and individuality which makes "grouping" for quotation purposes impracticable. The Company asks for details in such cases so that the appropriate quotations may be given. It should not be assumed that the larger collection automatically attracts a higher rate; the five-tank rate may well apply if the circumstances warrant it. In any case, quotations can be asked for, through the F.B.A.S., without obligation and I think fishkeepers would be unwise not to find out how much it would cost them to take out a policy.

* * *

THE aquaria world heard with surprise the news that Mr. R. E. V. Billings, well-known to club members, particularly in the London area, had been committed to prison for contempt of court. Due apology purged the contempt and his release was ordered. The trouble arose, I am told, through Mr. Billings' failure to comply with a court order to deposit within a given time a statement of accounts in connection with entries sent to him when acting as show secretary for the 1952 Exhibition of the National Aquarists Society. I understand that a sworn affidavit has now been made and the information sought by the N.A.S. has been or will be forthcoming.

Mr. Billings had volunteered to take over at short notice when the appointed official had to withdraw to do military training. The fact that he did not render a report or return documents at the end of the show led to the N.A.S. taking legal proceedings that have had these consequences for Mr. Billings.

Photograph] [I. M. Rankin

Lord Kingsdale, D.S.O., presents the prizes at A.S.L.A.S. annual interclub show. A fishkeeper, Lord Kingsdale is President of Redhill A.C. and resides in the locality.

The action by the society was made, I am given to understand, with the greatest possible reluctance but the Council felt it their duty to take it. Knowing, as I do, the parties on the two sides, I am certain the proceedings have been embarrassing to both and I can only express the hope that, once everything is settled, this chapter of events will be regarded as closed.

* * *

AS a follow-up to my notes on the National Aquarists Society's show last June, I can give two pieces of information, one regrettable though expected, the other reassuring. First, the 1953 event made a loss, the contributory factors being those given in these columns. Secondly, notwithstanding this setback, the Council on June 14 (the day after the show) met and decided to hold a 1954 event in the same hall and on the customary mid-June dates. Everyone will applaud the decision to go ahead with what has become firmly established as one of the leading exhibitions in the fishkeeping world.

The society's annual meeting is due to take place in October. Normally, under its rules, the resignation of Mr. L. B. Katterns as President would be automatic as would election of the vice-President to the chair. But Mr. W. A. Bone had to retire last year as vice-President owing to ill health and, recently his successor, Mr. George W. Kingston has relinquished the position, resigning also from the Council though retaining N.A.S. membership. Should there be nominations both for the posts of President and Vice-president all will be well for the former will serve for two years as such and the latter will do the same, with the added commitment of taking over as President for the following two. If no other nomination for the presidency is made, the Council could, no doubt, persuade Mr. Katterns to continue in office for another year. I would not be surprised to see that happen and would hazard a guess that Mr. W. Cleveland, a respected member of the Council, would be willing to stand as second-in-command.

Another change that has taken place, is that of the editorship of the N.A.S. Bulletin. Mr. George Hervey, a keen member of the society and well-known in the aquaria world as joint author with Mr. J. Hems of a 232 page book on Goldfish and a bigger work on freshwater tropical aquarium fishes, has taken over.

* * *

WHAT jolly company Mr. Hervey can be! Mr. C. E. C. Cole and I travelled to and from Birmingham with him when the three of us took part in the second annual convention of the Midland Association of Aquarists' Societies. Reminiscences flowed and on both the outward and homeward journeys the railway carriage at large was entertained by his running commentary.

Brum proved to be a convenient meeting place for Mr. Hervey and his co-author, Mr. J. Hems now living at Leicester. I remember the latter when he resided in London. At the time, when I was editing the aquaria section of *Cage Birds and Aquaria World*, our sister journal now re-titled *Cage Birds and Bird World*, Mr. Hems was a regular contributor of articles on tropical fishes.

The second member of the trio, Mr. Cole, who contributed his share of the conversation, has long been associated with the hobby and, although not so active these days as its assistant technical director, is still keenly interested in the Goldfish Society of Great Britain. At the present time he is engaged on preparing papers on pond life and, not content with his existing ponds, has recently bought some ground on which there is a large pond, almost a miniature lake. It has been untouched for years and much hard work has been put in, clearing it ready to keep and breed fish in it. A local government officer, Mr. Cole spends most of his spare time studying aquatic life and his work with the microscope is well-known. Articles by him have appeared in WATER LIFE and I hope to use more shortly.

* * *

THE M.A.A.S. Convention's chairman, Mr. H. Cadwallader of Handsworth, who directed the programme so well, is a schoolmaster by profession. He is fully aware of the potentialities of the Association.

Mr. W. L. Mandeville, who looks after the judges' panel, has a large and varied collection at his Great Barr home. W.L.M. is full of vitality and foresees great progress of the organised hobby in the Midlands. He is assisted in the work of increasing the usefulness of the judges' panel by Mr. D. A. Attewell of Walsall.

* * *

THERE are close links between the hobby in Bristol and Birmingham. Mr. Zenas Webb who judges or exhibits regularly at Bristol, lives at Moseley. He is a life member of the Midland Aquarium & Pool Society, whose annual exhibition at Birmingham proved a financial success.

Another having close association with

the west as well as the Midlands is Mr. W. Butler noted as a Goldfish exhibitor, whilst a third is Mr. T. L. Dodge, the M.A.P.S. secretary and show secretary. He lived for some years in Bristol but is now well-established in Birmingham. Mr. Dodge has worked hard for the society and has earned a break; not that he is going to take one. Instead, acting on the old saying that a change is as good as a rest, I hear he is contemplating withdrawing as show secretary of the M.A.P.S. to give more time to the work for the lecturers' service of the M.A.A.S.

Birmingham's premier show is well backed up by the trade and their stands made a very good setting to the competitive classes. Particularly attractive stands were those of Shirley Aquatics Ltd., and Stuart Erskine. Mr. Colin Roe of Shirley had on view some Bubble-eyed Goldfish sent to him by air from Malaya. They had been in the possession of a Chinaman located by Mr. Roe. It will be recalled that we mentioned the import of some Bubble-eyes by Mr. Roe over a year ago.

In Mr. Erskine, the hobby in general have a most useful individual since he co-operates with the local aquarists as their trade representative. As such he has an official standing in the organisation and his liaison helps to preserve the interests of both aquarists and traders. The fishkeepers of Brum and district know that they have need of the trade and vice versa. Such mutual understanding does much to keep up the interest of the hobby there.

* * *

FOLLOWING my day's outing to Birmingham, I had another "busman's holiday" in the form of a visit to Nottingham A.S. show. There, on the platform of the Albert Hall, next to Mr. J. Carnell, who had judged the competitive classes, I heard the Sheriff of Nottingham, who presided at the opening ceremony, speak very strongly in favour of the good work done by the society.

The show was declared open by Mr. George Cansdale who had arrived shortly beforehand from Lincoln where he had been fulfilling a similar engagement the previous day. He remarked on the fact that he had seen an Archer (Fish) in the hall, had met the Sheriff and that all he wanted now was to meet Robin Hood. Mr. Cansdale proved a great draw for many came to see in person a greatly-liked lecturer on television programmes. He readily complied with calls for his autograph and at one time a queue of several hundred children and a sprinkling of adults passed by the table where as fast as he could write, T.V's Zoo Man signed the show catalogues his admirers had bought.

Always out to attract the public, the promoters, under the leadership of Mr. H. P. Lymn, chairman, this time had a four-month old lion cub on view in an enclosure, and, at times, on a strong lead, walking round, allowing itself to be fondled and played with by the children. More in the aquatic line, a large Bubble-eye Goldfish took pride of place in a 9 ft. long aquarium and equalling the interest shown in the amphibians and reptiles was the attention paid to one of the marine tanks in which a Horse-shoe or King Crab, *Limulus polyphemus* took pride of place. The popular names are misnomers, for this creature is not a true crab but an arthropod, a relative of the arachnids or spiders, hailing from the Eastern coasts of North America.

IT was possible to crowd into two or three hours recently a visit to Fish Tanks Ltd., a cinema programme, a West-End lunch and a brief preview of the Radio Show: all strictly on business, of course. Whilst Mr. Rex Dutta, proprietor of Fish Tanks Ltd. was busy at Earls Court making up for lost time after the electricians' strike, Mr. Ashdown and I accompanied Mrs. Dutta to Studio One where we saw her and her husband feature in a Pathe Gazette film showing their "fish hospital".

Thence to the Trocadero where we joined Mr. Dutta for lunch—and made frequent glances at the several decorated aquaria, popular with patrons of the Salted Almond. Mr. Dutta, who installed these tanks, knows I dislike rockwork of gaudy and varying colours in aquaria but although he has not persuaded me to change my mind I must confess that they did not look so out of place in the well-lighted surroundings of a popular and good quality restaurant.

Next, on to Earls Court, where we saw another colourful creative effort by Fish Tanks Ltd., a large tank of tropicals, seen through a circular aperture, with a grid giving the impression of the latitudinal and longitudinal lines of the globe. This tank which attracted considerable attention was used to advertise Philco "Deep Sea" television.

* * *

ANOTHER aquatic note was struck at the Radio Show on the Vidor-Burndept stand. Radioactive tracers are becoming more and more useful to medicine and industry. How such tracers can be detected was demonstrated with the aid of an aquarium. Two Geiger counter tubes were mounted in the tank which contained a number of fish, including two Goldfish. On these two specimens, a tracer was attached to the caudal peduncle and when one of the fish passed one of the tubes the movement was recorded on a loudspeaker, was seen on a meter and made a light appear. The exhibit showed in a simple way how instruments can locate objects to which has been added a radioactive isotope. In this case, the "objects" were living fish and their constant movement set up a merry series of crackles on the amplifier, jerks of the meter needle and a rapid succession of flashes from the light bulb.

* * *

RECENTLY I had lunch with Dr. Myron Gordon, geneticist to the New York Aquarium. He has been lecturing at five centres in this country. I had previously been in correspondence with him on a number of occasions and he had contributed some interesting articles to WATER LIFE. During his stay in Britain he visited Dr. Helen Spurway, wife of Professor J. B. S. Haldane, and saw the Guppies which gave rise to Dr. Spurway's report leading to the current discussion on the possibility of spontaneous parthenogenesis. I am hoping in due course to get a reply from Dr. Spurway to the questions raised about the series of events resulting in the report appearing in *Nature*.

* * *

A GO-AHEAD atmosphere pervades Bethnal Green A.S. When I went along to the fourth annual show, I was impressed by the friendliness and keenness amongst the members. The entries for the show were good and of a great variety although, like the society, I was a little disappointed by the poor response in the interclub classes. Some very good teams were entered in the breeders' section. An outstanding Red won the cup for Mr. G. B. Thornton in the open London class for Fighters. It probably gave the best fish in the show, a mature Sailfin Mollie, shown by Mr. C. Louden, a good run for its money.

The society is lucky in having a live committee and perhaps I am not wide of the mark in saying that in addition to the lead given to members by its band of officers, it owes not a little to the incentive shown by its instructor (it is run as an evening activity under L.C.C. control), Mr. H. Allies, whom I have known for some time and who will be remembered as chairman of Harrow A.C.

It fell to my lot to present the prizes, a duty I was happy to perform. The awards were well distributed on the whole, despite the success of one exhibitor, Mr. H. Law, who had a "field day" with his tropicals. Before giving out the trophies cups, prizes and cards—and what a grand lot there were—my first task was to hand a large bouquet to Mrs. Woods, who was in charge of the F.B.A.S. publicity stand. It was a kindly thought on the part of the promoters to give recognition to Mrs. Woods in this way.

* * *

JUST one week later, I was presenting the prizes at another show, this time, the successful annual event of the Federation of Guppy Breeders' Societies. Well over 450 specimens graced the benches at St. Martin's School of Art in Charing Cross Road in Central London. The total entry was less than some had anticipated but nevertheless was a good one, bearing in mind the quality of the exhibits, particularly those that were given prizes. I am always impressed by the degree of interest shown by those who keep and exhibit Guppies. I noticed that members of affiliated provincial clubs did well in the awards list.

Unusual in design, Shirley Aquatics display was judged to be the best trade stand at Birmingham Show. On the last day, the decorative roof and front facia boards were removed to facilitate a rush of sales direct from the display tanks.

AQUATIC PRESS TOPICS

Barb × Goldfish Youngsters Produced?

"A TALL tale"—I know what will be the reaction of most fishkeepers when this story is related so let me preface it with W.T. Innes' own comments:—"The following account of the cross-breeding of such remotely related fishes is remarkable to the point of being difficult to believe. However, specimens of the cross are in the possession of Dr. Charles M. Breder, Jnr., of the American Museum of Natural History, New York. Dr. Breder has examined these fish and informs us that in his opinion they are valid Goldfish-Barb crosses". To that nothing can be added except that some of the youngsters were photographed and these pictures appeared in the Innes' journal. The essence of Mr. J. E. Kauffeld's account in THE AQUARIUM (U.S.A.) August issue is now given.

Last winter Mr. Kauffeld decided to attempt a cross between a female Oranda Goldfish and a male *Barbus binotatus*. The fish were hand-spawned and after a day the eggs were amber-coloured and appeared in good condition. At 78 deg.F. they hatched after three days. The fry adhered to the sides of the aquarium for a further three days before becoming free-swimming. They took Brine Shrimps immediately and grew rapidly. In less than a fortnight the tails of some fish had started to divide and shortly afterwards it was seen that there were four distinct body and tail developments. Two of the youngsters were Veiltails, with as fine tails and bodies as

Reviewed by —

L. W. Ashdown

Mr. Kauffeld had produced from good Veiltail stock; one of these had telescopic eyes and the other had an "Oranda hood" better proportionately than the mother fish had shown after a year. About three-quarters of the remaining fish had long Comet-like tail fins and very high dorsals. The other youngsters included some with the appearance of long-bodied Fantails and some which resembled ordinary Common-type Goldfish. All the young fish seemed to have inherited their father's speed of swimming movement—even the two Veiltails. Up to the time of writing none of the youngsters had shown gold-red colouring and all were a shiny olive-green. One misfortune occurred; this was when the aeration failed and twelve fish died including the two young Veils. Mr. Kauffeld now waits to see whether the survivors prove fertile.

MEMORY is supposed to give us a rosier impression of past incidents the longer they are stored but I did not think that my recollections were entirely at fault when viewing some Glass Catfish about two or three years ago. For, frankly, I was disappointed. In 1948 I had seen an earlier shipment of these fish and they definitely lived up to their name: the body was crystal-clear for most of its length and the skeleton was easily visible, the only parts where there was some opacity were the head and extreme fore-end of the body in the region of the internal organs. The fish which arrived later, *circa* 1950-51, were decidedly opaque with some body markings. They still justified their title of Glass Cats, as the body was certainly semi-transparent, but their body colour relationship with the earlier shipment was something akin to that of the X-ray Fish (*Pristella riddlei*) and the Glass Fish (*Ambassis lala*). There seemed to be two distinct species of these Catfish, very similar in body shape and most other external attributes, but differing in colour. Unfortunately both were running under the title of *Kryptopterus bicirrhus*. It was all very confusing.

Mr. F. Mayer (Hamburg, Germany) helps to throw some light on the apparent discrepancy in an issue of the AQUARIUM JOURNAL (U.S.A.). Mr. Mayer records that some American aquarists insist that the particularly transparent fish grow up into the more opaque, marked fish. This is possible and Dr. G. S. Myers, managing editor of the Journal, is looking into the possibility. Mr. Mayer goes on to give what seems to be a more likely solution when he says that Meinken identifies the opaque fish as *Kryptopterus macrocephalus*. These opaque fish are larger than *K. bicirrhus*, 4 in. compared with 2½ in., have a smoky blue colouring on the back, a faint colour all over the body and two black lateral stripes. The stripes run from the head to the tail (the lower one being broader) and terminate in a triangular mark at the base of the tail. Both are composed of small black spots and the space between the two lines is silver-yellow. Another very narrow black line runs lower down from the forward part of the body to about three-quarters along the base of the anal fin. All the fins are clear except for a suggestion of barring in the anal.

That is the position at present. Whilst the possibility that both colour-types are mere colour varieties of *K. bicirrhus* cannot be ruled out entirely, evidence seems to suggest that the "gem" is *K. bicirrhus* whilst the more readily-obtainable "Striped Glass Catfish" is *K. macrocephalus*.

From Continental Journals

Plant Antagonism

EXPERIMENTS and tests have been carried out recently by the scientific department of the V.D.A.—the German Aquarists' Association—to decide the old question whether a definite antagonism exists between *Vallisneria* and *Cryptocoryne*. The experiments were carried out under proper laboratory conditions, using absolutely uniform tanks, water, light and other conditions. Without wishing to go into the details of the experiments I would just like to give here the results which proved that neither Genus of these plants produces any materials harmful to the other, i.e., there is no antagonism between them. On the other hand the acidity tests have shown that there is a definite connection between the degree of acidity and the growth of these plants. The tests give a very interesting picture and indicate that Cryptocorynes flourish in water of low acidity, whilst *Vallisneria* flourishes in water of high acidity so this seems to explain why in many tanks these two groups of plants do not get on together. The above information was published in the August issue of DIE AQUARIEN-UND TERRARIEN ZEITSCHRIFT (DATZ).

— H. O. MUNRO.

National Exhibition of Cage Birds & Aquaria

January 7 - 8 - 9, 1954 Olympia, London, W.14

THE next National Exhibition of Cage Birds and Aquaria takes place on January 7, 8, 9, 1954, in the National Hall, Olympia, London, W.14. Our sister journal *Cage Birds* will sponsor the bird section for which a record entry in excess of 8,000 is anticipated.

WATER LIFE will be responsible for the aquaria display and has again invited the valuable assistance of the Federation of British Aquatic Societies, the Goldfish Society of Great Britain, the Federation of Guppy Breeders' Societies and the British Herpetological Society.

The aquaria section will occupy approximately 3,000 square feet, a considerably bigger area than last year, and the space available will be largely devoted to competitive classes for furnished aquaria (Interclub Tropical, Individual Tropical, Interclub Coldwater, Individual Coldwater, Junior Tropical and Junior Coldwater) and the instructional displays of the specialist clubs.

An innovation for 1954 will be a special Challenge Class in which Clubs can make one entry of a pair of livebearers (excluding Guppies), for which there is a standard recognised by the F.B.A.S. The prizes in this class will be awarded by F.B.A.S. judges but the results will not be made known until after 6 p.m. on the last day of the show.

From 2 p.m. on the opening day up to 6 p.m. on the final day, visitors will be invited to place the entries in the above Special Challenge Class in the same order as the judges, recording the points they award to each tank. The individual whose return is the same as or nearest to the official pointings will be given a cash prize of £3.3.0.

The Goldfish Society will again present a range of tanks telling, in sequence, the development of exhibition types. It is the intention of the Federation of Guppy Breeders' Societies to stage, on a competitive basis, furnished aquaria containing breeders' teams and the London Branch of the Herpetological Society will make as representative a display as possible for the time of the year. A novel, instructive exhibit is planned by the Federation of British Aquatic Societies and the combined effort of these specialist organisations plus the furnished aquaria classes and challenge class comprising WATER LIFE display will give the public a comprehensive picture of the scope of our hobby.

Preliminary details will be sent to all clubs and previous exhibitors in the near future. Although space is more than last year, it is nevertheless limited and entries should be sent in as soon as possible after the entry forms and schedules have been issued.

PRIZES :—

WATER LIFE Trophy for the best Interclub Furnished Aquarium; Awards of Merit and WATER LIFE Diplomas; Cash Prizes; Prize Cards.

ENTRY FEES :—

Interclub classes 5/-. Individual Classes 2/-.

ENTRIES CLOSE FIRST POST, DECEMBER 11.

The Exhibition will be open at the following times: Thursday 2.30-9 p.m. Friday 10 a.m.-9 p.m.; Saturday 10 a.m.-8 p.m. Further details will be announced in our next issue.

News from the North-west — *by "Aquaticus"*

Observations on Recent Aquarium Exhibitions

LABELLING of exhibits should receive careful attention by show secretaries. Indeed, a member could be detailed to pay special attention to see that all exhibits are fully and correctly labelled and not left solely with a catalogue number. The visiting public and the newspaper reporters may easily misconstrue particulars on inadequate labels. Even professional zoologists do not recognise fish unless they specialise in them. This point is raised because of what I saw at three recent public aquaria shows in different towns. At one a Squid was prominently labelled "Squib". At another a flora exhibit bore the label Companula for Campanula. I noticed when attending the Liverpool meeting of the British Association for the Advancement of Science, early in September, that the University's excellent but little-known aquarium of 18 tanks containing native fish, including Pike, Perch, Bream, Grayling, Carp, etc., bore not a single identity label, although a sign-card directed the zoology section to it as one of the official attractions.

When Chester Aquarist Society held its show at the Town Hall in August, one tank included the generally well-known Axolotl—but it was not well-known to the newspaper reporters who also have to write on weddings, town councils and football matches. Arising out of something one of the officials said, and the assumption that because it was a fish show anything seen swimming in a tank was a fish, the sub-editors handling reporters' "copy" produced a story headlined in dozens of northern newspapers: "The Fish That Won't Grow Up." After generations of naturalists have just about succeeded in teaching the public that a whale is not a fish, it now seems that they have got to start teaching them that the Axolotl belongs to the Class *Amphibia* and, with a certain glandular extract to help, it will grow up!

Exhibitions should be educational as well as competitive. Some brief, clearly-written facts about each animal or plant as a small tank label would be helpful.

The Chester Society now gets several fanciers from Wrexham where the much smaller Wrexham Aquarium Society is finding things difficult. The Chester Society is fortunate in having amongst its supporters Mr. Fred Williams, who is in charge of the new aquarium at Chester Zoo. Like his counterpart at Blackpool Aquarium (Mr. Legge), Mr. Williams is widely known as a judge at northern shows.

Southport Flower Show

At the renowned Southport Flower Show Perry's Hardy Plant Farm of Enfield was awarded a gold medal for its fine pool of Water-lilies and other plants. Its awards have been so consistent here since 1947 that again I looked in vain for any other exhibitor of aquatic plants outside the side-lines shown in the rock gardens. The Perry exhibit was composed of a large pool raised, as usual, on a bench at eye-level, not down on the ground. It contained the reddish pink Water-lilies, *Nymphaea Marliacea rosea, Escarboucle, James Brydon,* the yellow *Marliacea chromatella* and the white *Gladstoniana,* with the purple-mauve flowers of *Eichhornia crassipes* var. *major.* The so-called Parrot's Feather (*Myriophyllum proserpinacoides*) trailed out on to the limestones for effect. Bordering the pool were tall *Thalia dealbata,* the Sedges *Cyperus Haspan,* the Galingale (*C. longus*), and tall mopheads of *C. Papyrus,* the club-rushes *Scirpus Tabernaemontani* var. *zebrinus, S. albescens* and *Imperata saccharifiora.* Along the pool-border were several fern species, also *Calla palustris,* the Flowering Rush (*Butomus umbellatus*), the purple flowers of *Pontederia cordata,* the Sweet Flag *Acorus graminens* var. *variegatus,* the huge pennywort-like leaves of *Nelumbo nucifera,* the large elephant-ear leaves of *Colocasia antiquorum, Trapa natans,* two *Miscanthus* species and *Saccharum officinarum.* In flower show tradition, they were all labelled in Latin only. If the popular names had been given, it would have been seen that several of the plants, such as the Flowering Rush, Royal Fern, and Galingale grow wild in the ditches and ponds of this country.

A slip occurred in my June-July notes when I stated that Dr. F. N. Ghadially, President of the Sheffield A.S., was studying the tail-deficiency in Zebra fish instead of the Tiger Barb (*Barbus tetrazona*). Dr. Ghadially tells me that since he finished making his first film—"Breeding the Brown Acara"—a few months ago, he has started making another colour film on fish, reptiles and amphibians of interest to the aquarist, which he hopes to show at the next Northern Federation Assembly. He is also making a monochrome film dealing with the feeding of fish. Since his film on the Brown Acara was shown with success at an F.N.A.S. Assembly, Dr. Ghadially has been rather disappointed that only about eight societies have requested hire of this film, in view of the considerable trouble and expense he went to in producing it. Perhaps it is because few secretaries know it is available? Dr. Ghadially lives at 10 Sheldon Road, Nether Edge, Sheffield, 7, if they wish to contact him.

Accrington Show

Accrington is only a small town as Lancashire towns go, and it is tucked away in a bleak corner of the Pennines. However, when I visited its four-day annual show in the Town Hall early in September, I was most impressed by the enormous support this town of little more than 40,000 people gives the Accrington and District A.S. Walking round with Mr. S. Ratcliffe, the show secretary, I was informed it cost over £100 to stage the event—£10 a day for the hire of the hall, plus £5 for the first evening when apparatus was assembled, and the rest in electricity charges, hiring of materials, transport, etc. How does the society get it back? Last year 7,000 people paid to see the show, and the society donated £88 to the Lynmouth Fund! They run two competitions for £40 in prizes and two tanks. The society's total membership, however, is only about 50 and the subscription 5/- per annum. Last year membership was 80 and before that it had been 100. Part of the fall is due to the formation of an aquarists' society at Haslingden, whence some of their former members originated.

Accrington has a reputation for furnished aquaria, and this, their fourth annual show, lived up to the reputation. About 40 tanks, including some set up by their nine or ten junior members, were all furnished and there were no individual fish exhibits as the officials think they are less popular at a public show.

Entries came in from as far afield as Rochdale, Bury, Haslingden and Bolton and, in order to widen the educational interest, the Manchester Microscopical Society put on an exhibit which showed under the microscope anything from the multiple eyes of a water-beetle to the ever-obliging flea! The Accrington Naturalists' Society showed butterflies and moths, pressed wild flowers and local photographs. There were some cacti and young alligators and the local parks had helped out with tubs of evergreens for decoration. One of the most interesting of the exhibits was a miniature rock-garden of alpines, etc., complete with waterfall and a shallow glass tank serving as a table "lily-pool" containing a Water-dahlia (rather like a miniature pink Water-lily), Hornwort etc., and small Goldfish. All this occupied a metal cabinet-stand half the size of a card-table, with the front aspect occupied by an illuminated glass side of the pool.

Who are the sort of people behind such a vigorous society? At the top there is Ald. W. W. Cocker, O.B.E., the President. The chairman, Mr. F. J. Green, is a property repairer, the secretary, Mr. E. Smith, a clerk, Mr. S. Ratcliffe, the show secretary, a prison officer at Preston, and Mr. W. M. Scaife, the treasurer, an engineer by profession. Very energetic in the pre-show preparations was Mr. V. Stephenson, a member who combines very usefully his profession as an electrician. Many of the members are in shops or have their own businesses. They are rather pleased about the feat of one of their members, Mr. H. Crabtree, who recently hatched out some Grass Snake eggs in heated peat. Table-shows about every other month are among the main activities, but they also run an occasional quiz and a table-show of any six fish with the Blackpool and Fylde A.S. and other societies.

Midland Aquarists' Association Convention

THE second annual convention of the Midland Association of Aquarists' Societies was held on August 29 at the Midland Institute, Birmingham, when over fifty representatives from 15 societies, compared with delegates from only seven societies last year, attended and heard of the further progress made.

Mr. H. Cadwallader, the chairman, conducted the business extremely well and after Mr. J. Druce introduced those on the platform, Mr. C. E. C. Cole of Ilford read a detailed paper on "The Hobby—Past, Present and Future".

The Association has a lecturers' panel and its usefulness was made apparent by Mr. T. L. Dodge who looks after its arrangements. There has been a steady increase in the demand for this service over the year and, with more speakers enrolled, the panel will be able to widen its scope still further.

The second visiting speaker was Mr. G. F. Hervey, F.Z.S., who lectured on fish breeding, illustrating his points with blackboard drawings.

Mr. W. L. Mandeville gave an encouraging report of the work done by the judges' panel and it was obvious from his account that those who were examined before being recognised as M.A.A.S. judges were put through a stiff course. They will now be able to place the awards at all shows held by societies affiliated to the Association and as their ability becomes known will probably be in demand by outside show-promoting societies.

It was fitting that the certificates of competence issued to the new judges should be presented by Mr. Zenas Webb, who has been connected with the hobby for many years, is a leading Goldfish breeder, has close connections with Bristol A.S. in the west, and it, I believe, likely to be invited to further the interests of the Goldfish Society of Gt. Britain in the Midlands.

As the third visiting speaker, I was able to offer my congratulations to the M.A.A.S. on the progress it has made and on the value of its work. In so densely a populated area as Birmingham and district, it is natural that, like London, it should be served by a number of local societies. At the same time, it has been proved in more ways than one that some degree of co-ordination of effort is necessary. Ready co-operation between the member societies has brought about the formation of the M.A.A.S. and its usefulness has already repaid those responsible for its inception. The fifteen constituent societies support each other, whilst retaining their independent status in all local matters, interchange lecturers through the M.A.A.S. panel, have a number of trained judges to officiate at their shows and help to make sure that any exhibitions put on are backed up with plenty of entries. Evidence of this was the support given to the annual show of the Midland A. & P.S. held at the same time as the convention in the spacious minor hall of the City's exhibition centre (Bingley Hall). At a risk of being accused of repetition I would say that in my opinion there is room for other area organisations in other parts of the country. — W. J. PAGE.

Bombay A.S. Bulletin

THE members of Bombay A.S. are preparing the first issue of a bulletin which will be published regularly to record this Indian society's activities. Articles by members and others interested in the hobby will be included. The joint editors will be Mr. S. J. Dadyburjor, whose name has been given to a *Loubuca* species (*L. dadiburjori*) and Mr. H. G. Kevalramani, curator of the Taraporevala Aquarium.

Toxicity of Tar Acids

OUR Water Analyst who reported on the above subject in our last issue (p.223) has now sent the following note which supplements his observations on phenolic substances (tar acids):—"There is, I believe, a specially prepared bituminous paint from which all water soluble constituents have been extracted. This paint would no doubt prove to be non-toxic to fish life if used for waterproofing ponds."

SHOW REPORTS

Hendon's Furnished Aquaria Exhibition

SOME very high quality fish were seen at Hendon A.S. exhibition held in conjunction with the 1953 Hendon Borough Show. Six competitive classes attracted a representative though not over-large entry and the addition of a number of tanks containing fish owned by members of the society combined to make a display that earned well-merited praise from the visiting public.

Among the non-competitive exhibits we saw some very good Knife Fish and Reed Fish belonging to Mr. F. Oliver, the Marbled Cichlid which did well at Manchester and the N.A.S., owned by Mr. D. Cannon, and some well developed *Neolebias ansorgii* shown by Mrs. D. Robertshaw. Of especial interest was a shoal of *Laubuca dadiburjori*, the fish described by Mr. S. Dadiburjor of Bombay, after whom they are named, in the April 1953 issue of WATER LIFE. The specimens are the property of Mr. R. Skipper who is chairman of the society and who lives up to his name in the way he handles and directs the society's affairs.

Numerous tanks containing reptiles and amphibians were set up by Mr. D. O. Carr of Greenock, a keen member of the Scottish Aquarium Society and the British Herpetological Society. He travelled south to put up the section and to enter a tank on behalf of the Scottish society in one of the interclub classes, in return for the support given by Hendon members to S.A.S. shows in Glasgow.

The display was accommodated in a very large marquee, the tanks, seen through apertures in hardboard panels, lining the four walls. There was adequate space for the aquariums, all of which were furnished, to be seen in comfort. To the keen aquarist the standard of the fish and the competence of those who set up the competitive tanks gave much satisfaction; to the lay public the presentation of the show was most pleasing. Comments overhead confirm that the visitors, who were not dyed-in-the-wool fish breeders who want to compare rows of like fishes, are attracted by set-up aquariums, the plants, compost and rockwork, all contributing as much to the beauty of the exhibits as the fish themselves.

A show of this nature can only be achieved when there is plenty of goodwill and an adequate number of helpers. Hendon A.S. has both and the adult members, including a rota of lady stewards, were ably assisted by some of the junior members who spent many hours on the preparatory work before the show opened to the public.

COMPETITIVE CLASSES

INTERCLUB COLDWATER FURNISHED. Judges: Messrs. A. Boarder and W. Dacre. 1, Marble Arch A.S. (77 pts.). Two large red scaled Fantails, contrasting well with good variety of plants. Pebbles used seemed to be a little too bold for the overall picture. 2, West Middlesex A.S. (73). Solitary but shapely Bristol Shubunkin in a well-planted set-up. Neat, somewhat flat pieces of grey-green rockwork employed, resting on sand of fine texture. Design gave sweep to back right-hand corner, creating sense of depth. 3, Watford A.S. (72). Four well-matched, medium-sized London Shubunkins made a nice team swimming in the area left clear towards the centre of the tank. If anything, the planting looked more natural than in the 2nd prizewinning tank but suffered by being sparse here and there. 4, Harrow A.C. (68). Two big red Fantails looking rather lost in the very open centre. Not very impressive rockwork was used but the plants were in fine condition. Better design, giving more irregular placing of rocks and plants, avoiding the formal semi-circular appearance, would have earned more points.

INTERCLUB TROPICAL FURNISHED. Judges: Messrs. C. W. G. Creed and J. Carnell. 1, West Middlesex A.S. (73 pts.). Excellent plants, skilfully placed, with compost built up to create impression of depth and space made a nice tank, accommodating Harlequins, five species of Barbs (including some very fine *B. schuberti*) and *H. serpa*. Well deserved win. 2, Boreham Wood A.S. (72). Two exceptional Angel Fish caught the eye here but low rockwork, revealing inadequate single row planting at the back lost a few points. 3, Watford A.S. (68). Some nice Glowlights, Flames and Pencil Fish looked in first-class condition but somewhat scrappy planting of subjects, limited in variety, detracted from a well thought out design. 4, Ruislip A.S. (67). A varied collection of fish including Tiger and Nigger Barbs, Neons, a Black Mollie, Serpæ and Rosaceus looked well in front of some neat mottled rockwork. The plants shown were of a high quality but rather too few to complete the picture.

INDIVIDUAL COLDWATER FURNISHED. Judges: Messrs. Dacre and Boarder. 1, F. Oliver (81 pts.). Two neat but small red Fantails. Rather heavy rockwork and somewhat over-large specimens of *Elodea* which outclassed the other plants. 2, H. A. Hallett (75). Neat Sunfish in a wilderness of small plants giving a less tidy appearance. The good quality of the material here could have been used to a little better advantage, particularly as the rockwork was well placed, looking unobtrusive and natural in its setting. 3, T. Bain (73). Small Golden Rudd with large piece of not unattractive porous rockwork. More plants were needed to build up the background. 4, A. Stevens (71). Sunfish in a tank where good rockwork and carefully blended gravel were used. Faulty planting left patches that looked unnatural.

INDIVIDUAL TROPICAL FURNISHED. Judges: Messrs. C. W. G. Creed and J. Carnell. 1, 2 specials, T. Hobday (76 pts.). One of the best designs we have seen created by an individual exhibitor. Plants of good order presented the appearance of being well established and the rockwork looked very pleasing with its brown hue contrasting with the green of the plants. The collection of fish included Rosy Barbs, Scissortails, Red Swords., and small Three-spot Gouramies. 2, Mrs. Robertshaw (75). Another very good effect obtained with some very nice Bloodfins, Penguin Fish, Cherry Barbs and Lemon Tetras. The plants were very good but a little thinly planted here and there and the flat pieces of rockwork were perhaps a trifle big for the picture as a whole. 3, H. A. Hallett (73). Happy blending of plants and rockwork but spoiled, we thought, by a definite division, leaving blank space at the back between two attractively laid out sections. 4, P. O'Connell (71). Three large pieces of rockwork tended to predominate the scene but not sufficiently so as to detract from a good design, in which plants, fish (Neons and Serpæ) and compost were all of good quality.

MARINE AQUARIA. 1, J. Robertshaw (84 pts.). Well chosen pieces of coral, anemones and a Marine Angel Fish gave a typical seawater view. Very clear water. 2, B. Andrews (71). Several seaweeds and pieces of rock were used, with one or two anemones and a crab. More like an inshore stretch than a deep sea picture. Needed a filter to look at its best. 3, F. Oliver (68). Good build-up of rockwork but the fish, anemones and Hermit Crabs looking a little crowded. JNR. CLASS. 1, Master M. J. Darvell (61 pts.). A promising entry with Red Swords., Platies and Guppies, but too thinly planted. The runner-up, with 58 pts., is also to be commended on a good effort for a junior member.

HENDON SHOW OFFICIALS

Some of the Hendon Society's officers who were responsible for the very fine furnished aquaria display staged in a marquee at the recent local Borough Show.

Photograph [*T. Barling*

Increased Entry at Rochdale Society's Show

AT the Rochdale A.S. second annual open show there was a total of 321 entries, which represented a 20 per cent. increase over last year. In addition to the Rochdale exhibitors, entries were received from Bury, Haslingden, Manchester, Oldham, Nelson, Burnley, Eccles, Bolton, Stockton-on-Tees, Heywood, Salford, Radcliffe, Rossendale, Hebden Bridge, Middleton, Liverpool, Bacup, Blackburn and Ashton-under-Lyne.

The F.N.A.S. judges, Messrs. Legge, Snape and Warburton, officiated and commended the society on the general organisation and layout.

A notable point was that in the coldwater furnished class the first prizewinner gained 84 points and the second, 82½ points, whereas in the tropical furnished class the first gained 81 points and the second 79½ points. Best fish in show was a Thick-lipped Gourami shown by Mr. W. Swales.

A vivaria exhibition by Messrs. Barbrook and Oliver and the display by the Manchester Microscopical Society proved of interest to the visitors. Mr. Warburton distributed the prizes at the close of the show. The attendance was down by over 2,000 compared with last year.

PRIZEWINNERS

INTER-CLUB FURN. AQUARIA, TROP. (6): 1, Haslingden A.S.; 2, Rochdale A.S.; 3, Burnley A.S. OPEN FURN. AQUARIA, TROP. (17): 1, Mrs. J. Dodsworth; 2, N. Atkinson; 3, Mrs. D. Loder. MEMBERS' FURN. AQUARIA (14): 1, Mrs. I. M. Fletcher; 2 & 3, Mrs. J. Dodsworth. OPEN FURN. AQUARIA, COLDW. (7): 1, Mrs. I. M. Fletcher; 2, Mrs. J. Dodsworth; 3, W. Taylor. GUPPIES (25): 1 & 2, T. Ivill (Scarftails); 3, W. H. Tripp (Veiltail). SWORDS.: (16): 1, J. R. Shaw (Red-eyed Red); 2, F. Taylor (Tuxedo); 3, Mrs. I. M. Fletcher (Red). MOLLIES (17): 1, D. & H. Loder (*M. velifera*); 2, C. A. Blake (Black); 3, A. N. & K. Rycroft (*M. latipinna*). PLATIES (13): 1, A. N. & K. Rycroft (Black); 2, E. G. & J. Maynock (Tuxedo); 3, B. Taylor (*P. variatus*). BARBS (33): 1 & 2, C. E. Cotton (Spanner and Tiger); 3, A. L. Brocklehurst (*B. everetti*). CHARACINS (35): 1, J. R. Shaw (*Metynnis roosevelti*); 2, F. A. Kay (*Astyanax bimaculatus*); 3, C. A. Blake (Neon). FIGHTERS (6): 1, W. J. Leeming (Blue); 2, L. Wardle (Red); 3, A. N. & K. Rycroft (Red). A.O.S. LABYRINTH (33): 1, W. Swales (Thick-lipped Gourami); 2, D. C. Crisp (Pearl Gourami); 3, B. Taylor (Thick-lipped Gourami). CICHLIDS (13): 1, J. R. Shaw (Angel); 2, Mrs. D. Hinchliffe (Angel); 3, C. A. Blake (*Apistogramma ramirezi*). A.O.S. TROPICAL (24): 1, R. R. Walsh (Lyretail); 2, J. R. Shaw (Black-banded Sunfish); 3, Mrs. I. Shepherd (Lyretail). SHUBUNKINS (13): 1 & 3, A. R. Thompson; 2, Mrs. J. Dodsworth. A.O.V. COLDW. (22): 1, Mrs. I. M. Fletcher (Common Goldfish); 2, N. Gott (Fantail); 3, M. Close (Moor). BREEDERS' LIVEBEARERS (10): 1 & WATER LIFE Diploma, A. N. & K. Rycroft (*M. velifera*); 2, D. & H. Loder (*P. variatus*); 3, C. A. Blake Scarftail Guppies). BREEDERS' EGGLAYERS (17): 1, WATER LIFE Diploma & 3, C. A. Blake (*Apistogramma ramirezi* and Nigger Barbs); 2, A. N. & K. Rycroft (Blue Fighters).

Fantail Takes the Honours at Friern Barnet Show

Smaller Entry But Prizewinners of Good Quality

OVERALL size of the entry and quality of the exhibits was a little down at the Enterprise A.S. show held in Friary Park from August 20-22. Possibly the reason was that no show was held last year; a break in sequence frequently results in a poor response initially when such an exhibition is resumed. Nevertheless there were some very good exhibits on view. Count among them the first-prizewinning scaled Fantail in the Fancy Goldfish class which went on to take the WATER LIFE Diploma for best coldwater fish and also the award for best fish in show for its owner Mr. W. L. Wilson. Another top-quality exhibit in this section was a Perch shown by Mr. H. Shepherd which led the A.O.V. Coldwater class and was one of the best of this species seen at post-war shows.

Among the tropical livebearers Guppies were staged in good numbers. Albinos took first and second places in the Swordtail class. The leaders had delicate colouring and were also a little ahead on matching. Well-developed *M. velifera* led the Mollie class but it was difficult to judge their finer points as they were not showing too well when viewed. *P. variatus* took first and second places in the Platy class. Both showed their colouring well but the first prizewinners were ahead on shape and size.

Giant Danios Lead

Really fine Giant Danios held first three places in the Danio, White Cloud and Rasbora class. There was little to choose between the first two, both were of excellent size and condition, but the first pair were a trifle larger and had slightly better body shape. A Rosy Barb pair led the Barb class, Colour and body shape were good but matching not exceptional. The male fish in two Checker Barb entries were really fine but both were faulted owing to inferior females. Among the Characins, *H. rosaseus*, nicely shaped, excellently matched, but not showing their colour too well, were followed by a well-coloured pair of *Nannostomus anomalus*.

Good colour was shown by the leading Blue Fighter but it was down-pointed a little by red in the pelvics. The second in this class was another Blue with not such good body colour or pelvic fin shape. Three top-class exhibits headed the A.O.S. Labyrinths. First was a very nearly faultless Leeri, with beautiful body and finnage, and colour showing well. This was followed by a well-sized Kissing Gourami and a Dwarf Gourami, nicely coloured but with lateral stripes a trifle faulty. Another strong class was that for Cichlids. Somewhat unusual leader here was a fine Porthole Cichlid ? *Hemichromis fasciatus* which was awarded the WATER LIFE Diploma for best tropical fish in show. Second was a well-sized and conditioned *Cichlasoma festivum*. Catfish took first and second places in the A.O.S. Tropical class and an *Aplocheilus* was third.

Deserving winners in the Breeders' Coldwater were a sextet of Moor Goldfish—very well grown and matched. First in the Breeders' Livebearer class were an extremely sprightly and well-conditioned shoal of Blue-eyes (*Girardinus*). Mrs. B. Robertshaw took first four places in the Breeders' Tropical Egglayer class. Her first prizewinning entry of the difficult *Rasbora maculata* was especially interesting.

Strong Furnished Aquaria Class

Out of the five entries in the Club Coldwater Furnished Aquaria class, four—an extremely good percentage—were of a very commendable standard. The first prizewinner was shown by Stoke Newington and was most attractive with some nine contrasting plant species used effectively. The fish were Calico Fantails. Hendon, who was second, had a more novel design but, if anything, the straight-leafed plants and heavy rockwork tended to over-accentuate the focal point. Third was Hornsey with a pleasing but orthodox tank. Unfortunately the plants were too tightly packed but the Golden Rudd were good.

In the Club Tropical Furnished Aquaria Hendon led with an attractive layout. The plants and rock grouping gave an excellent impression of depth. The fish were fine Lemon Tetras and *Hyphessobrycon serpae*. Tottenham, second prizewinner, had a community of Barbs. The plants were clean and of good quality but rockwork and compost had an artificial appearance. Harrow was third with a tank where plants were nicely grouped but, this apart, a design was not too evident. Grey rock and compost, with Leeri Gouramies as the fish, did not give much contrast.

In the Individual Tropical Furnished Aquaria class 18 in. tanks were used. These naturally restrict the exhibitors' scope somewhat. First prizewinner was Mr. Collyer who achieved a natural effect with his planting.

The show was well staged in a marquee and once again Mrs. W. M. Meadows acted as show secretary. The entries in the Swordtail, Mollie, Platy, Danio, White Cloud and Rasbora, Barb and Characin classes were staged in pairs. Judges were Messrs. A. Boarder, C. W. G. Creed and W. G. Phillips.

PRIZEWINNERS

CLUB TROP. FURN. AQUARIA: 1, Hendon A.S.; 2, Tottenham A.S.; 3, Harrow A.C. CLUB COLDW. FURN. AQUARIA: 1, Stoke Newington A.S.; 2, Hendon A.S.; 3, Hornsey A.S. INDIVID. FURN. AQUARIA: 1, Collyer; 2, Briggs; 3, Kirkpatrick. SHUBUNKINS: 1, A. Defelice; 2, J. Franklin; 3, Mrs. Mepham. FANCY GOLDF.: 1, W. L. Wilson; 2, A. Defelice; 3, J. Franklin. A.O.V. COLDW. FISH: 1, H. Shepherd; 2, M. A. Green; 3, T. G. F. Oakes. GUPPIES (ROUND-, SPEAR-, COFERTAIL AND ROBSON): 1 & 2, S. Brown; 3, E. S. Lloyd. GUPPIES (TOP-, BOTTOM-, DOUBLESWORD AND LYRETAIL): 1, 2 & 3, A. T. Johnson. GUPPIES (VEIL-, SCARF-AND FLAGTAIL): 1, E. S. Lloyd; 2, J. H. R. Leggett; 3, E. F. Russell. SWORDTAILS: 1, G. S. Rutt; 2, F. H. West; 3, Mrs. W. M. Meadows. MOLLIES: 1, J. H. R. Leggett; 2, Mrs. W. M. Meadows; 3, Mrs. I. Seaman. PLATIES: 1, Mrs. N. Russell; 2, K. F. Nutt; 3, T. R. Oakes. DANIOS, WHITE CLOUDS AND RASBORAS: 1 & 2, J. H. R. Leggett; 3, Holdstock. BARBS: 1, Mrs. N. Russell; 2, C. Crowsley; 3, Holdstock. CHARACINS: 1, F. H. West; 2, R. Collyer; 3, Holdstock. FIGHTERS: 1 & 3, T. G. E. Oakes; 2, C. King. A.O.S. LABYRINTH: 1 & 3, F. H. West; 2, Holdstock. CICHLIDS: 1, Mrs. N. Russell; 2, J. H. R. Leggett; 3, M. A. Green. A.O.S. TROP.: 1, F. G. Wood; 2, J. H. R. Leggett; 3, T. G. F. Oakes. BREEDERS' COLDW.: 1, 2 & 3, H. C. Nutt. BREEDERS' LIVEBEARERS: 1, K. Nutt; 2, F. H. West; 3, Russell-Holland. BREEDERS' EGGLAYERS: 1, 2 & 3, Mrs. B. Robertshaw.

Goldfish Society's News

MR. R. J. AFFLECK, M.Sc., M.R.S.T., visited a recent meeting of the Goldfish Society of Great Britain's Hants and Sussex Section. Hostess was Miss D. Morris at her home in the Preston Park area of Brighton. Fish in large ponds and in a greenhouse were admired by the members. Mr. Affleck took along some of the Bubble-eye Goldfish from the first spawning he had from this variety (see page 258).

The North-west Section belatedly celebrated its first anniversary on July 13 by visiting the home of Mr. Zenas Webb and, after viewing this renowned exhibitor's stock, journeyed to Shirley Aquatics.

Bath's Well-supported Three-Day Exhibition

Photograph] [*W. Morris*

Opening ceremony at Bath society's show. Left to right: Mrs. W. J. Hindson, (chairman of the show committee), the Mayor of Bath, Mr. L. Cryer (chairman) and Miss. A. Gurney, secretary.

BATH A.S. staged a three-day show in the Pump Room, Bath, recently. There were 223 exhibits in the 24 classes and premier honours went to an Angel Fish owned by Mr. W. E. Ridler. It was awarded a WATER LIFE Diploma. Judging the exhibits were Mrs. W. Meadows and Mr. A. Boarder. The Mayor opened the event and the Mayoress presented prizes on the third day.

PRIZEWINNERS

CLUB FURN. AQUARIA: 1 and Sydney Cup, Keynsham A.S.; 2 and 3, Bath A.S. INDIVID. FURN. AQUARIA (TROP.): 1 and Mrs. Gurney Cup, Mrs. D. Hindson; 2, Miss A. Gurney; 3, L. Powell. INDIVID. FURN. AQUARIA (COLDW.): 1 and Mrs. Gurney Cup, L. O. Emery; 2, D. Benson; 3, F. L. Edwards. MALE GUPPIES: 1 and Hindson Cup, W. J. and D. Hindson; 2, W. R. Smart; 3, G. S. Stone. SWORDS., MOLLIES & PLATIES: 1, D. Benson; 2, R. Janes; 3, V. F. Legge. A.O.S. LIVEBEARER: 1, W. J. and D. Hindson; 2, Miss A. Gurney; 3, F. L. Edwards. DANIOS, RASBORAS & WHITE CLOUDS: 1, R. King; 2, Gregory; 3, Mrs. Hemming. BARBS: 1 and 3, Miss A. Gurney; 2, W. E. Ridler. LABYRINTHS: 1, W. E. Ridler; 2, R. Janes; 3, Miss A. Gurney. CHARACINS: 1, D. Pitt; 2, Mrs. Hemming; 3, C. B. Baynton. CICHLIDS 1, Robert Membery Cup and W.L. Diploma, W. E. Ridler; 2, Mrs. Hemming; 3 and B. W. Moore Trophy, W. J. and D. Hindson. MALE FIGHTERS: 1, Mrs. Hemming; 2, W. E. Ridler; 3, G. J. Lloyd. A.O.S. TROPICAL FISH: 1, Mrs. Hemming; 2, Miss A. Gurney; 3, L. Powell. BREEDERS' LIVEBEARERS: 1 and A. C. Gurney Cup, R. Janes; 2, D. Benson; 3, C. B. Baynton. BREEDERS' EGGLAYERS: 1, A. C. Gurney Cup and Campion Breeders' Trophy, W. J. and D. Hindson; 2, G. B. Todd; 3, Miss A. Gurney. COMMON GOLDF.: 1, D. Benson; 2 and 3, G. S. Stone. SHUBUNKINS (5 IN.): 1, B.A.S. Cup and 3, L. C. Emery; 2, P. J. Simmons. SHUBUNKINS (3 IN.): 1, L. Cryer; 2, F. Brain; 3, W. A. Savage. FANTAILS: 1, Primo Cup, 2 and 3, A. W. Rudge; B. W. Moore Trophy, B. W. Moore. A.O.V. GOLDF.: 1, L. Powell; 2, L. Cryer; 3, L. G. Emery. POND OR RIVER FISH: 1 and 2, P. J. Simmons; 3, L. Powell. BREEDERS' SHUBUNKINS: 1 and Mrs. V. W. Gardener Cup, F. Brain; 2, D. Benson; 3, A. W. Rudge. BREEDERS' A.O.V. FANCY GOLDF.: 1, Hindson Cup, 2 and 3, A. W. Rudge. AQUATIC PLANTS: 1, W. J. and D. Hindson; 1 and 3, D. Pitt.

Newport Wins Inter-society Cup at Welsh National Show

CHIEF prizewinners at the second Welsh Aquarists' Show, run by the Welsh National A.S. at Cardiff on August 21-22, were Messrs. J. Martin (with a Moor which was best fish in show and best coldwater fish), R. F. Jones (with a Red Sword., best tropical fish), S. Steer (best furnished aquarium) and Miss C. Lewis (with a Common Goldfish, best junior exhibit). The Newport A.S. won a Challenge Cup in the inter-society furnished aquaria contest for Welsh societies where five clubs competed.

The show was well attended and many new members were enrolled. The judge was Mr. E. Chapman.

PRIZEWINNERS

COMMON GOLDF. UNDER 3 IN. (4): 1, Miss C. Lewis; 2, Miss A. James. COMMON GOLDF. OVER 3 IN. (6): 1, G. Cornish; 2, Mrs. V. C. Vokes; 3, F. Rochell. SHUBUNKINS UNDER 3 IN. (8): 1, 2 & 3, I. Smith. SHUBUNKINS OVER 3 IN. (25): 1 & 3, I. Smith; 2, F. Chapman. A.O.V. FANCY GOLDF. (5): 1 & 2, J. Martin. A.O.V. COLDW. FISH (4): 1, J. Amesbury (Catfish); 2, F. Rochell (Rudd). SWORDS. (8): 1, R. Jones (Red); 2, W. H. Jones (Black); 3, A. Malcolm (Red). MOLLIES (5): 1, J. Martin (Sailfin); 2, M. E. Lewis (Speckled). GUPPIES (16): 1, R. S. Wigg; 2, R. F. Jones; 3, J. Martin. A.O.S. LIVE-BEARER (4): 1 & 2, M. E. Lewis (Blue-eye and Moon Platy). LABYRINTHS (3): 1, J. Martin (Leeri). CHARACINS (7): 1, M. E. Lewis (*H. pulcher*); 2, R. F. Jones (Neon); 3, S. Steer (Beacon). BARBS (10): 1, F. Chapman (Half-banded); 2, R. S. Wigg (Tiger); 3, M. E. Lewis (Cherry). DANIOS ETC. (5): 1, M. E. Lewis (Pearl); 2, F. Chapman (White Cloud); 3, B. Vickery (Pearl). A.O.S. TROP. (3): 1, M. E. Lewis (Australian Rainbow). FURN. AQUARIA, COLDW. (3): 1, R. Brotherton. FURN. AQUARIA, TROP. (5): 1, S. Steer; 2, J. Amersbury.

Large Entry at Wembley A. & P.A. Event

AT the third annual show of Wembley A. & P.A. Mr. M. Green's *Cichlasoma festivum* took the WATER LIFE Diploma for best fish in show. In the 23 classes, 340 exhibits were staged and judging was carried out by Mrs. B. Robertshaw, Mrs. W. M. Meadows, Mr. W. G. Phillips and Mr. A. Boarder. The awards, which consisted of cups, plaques, medals and special prizes, were presented by Mr. and Mrs. Steve Race. A tape recording machine enabled visitors to give their impressions of the show.

CLUB FURN. AQUARIA (TROP.): 1, W. Middx. A.S.; 2, Marble Arch A.C.; 3, Hendon A.S. CLUB FURN. AQUARIA (COLDW.): 1, Hendon A.S.; 2, W. Middx. A.S.; 3, Willesden A.C. INDIVID. FURN. AQUARIA (TROP.): 1, T. Hobday; 2, A. Baldock; 3, A. Williams. INDIVID. FURN. AQUARIA (COLDW.): 1, S. Wingrove; 2, Hennessey. COMMON GOLDF.: 1, S. Wingrove; 2, M. Price; 3, E. Harris. SHUBUNKINS: 1, & 3, E. Harris; 2, Miss E. Hill. FANTAILS: 1 & 2, T. Fromant; 3, W. Smyth. BRIT. COLDW. FISH: 1 & 2, G. Leveridge; 3, E. Davison. SWORDS.: 1, M. Green; 2, Joyce; 3, D. Cannon. PLATIES: 1, G. Newcombe; 2, C. Lacy; 3, A. Williams. MOLLIES: 1, G. Eastop; 2, C. Brown. MALE FIGHTERS: 1, C. King; 2, Mrs. E. Lynch; 3, Rundle. A.O.S. LABYRINTH: 1, W. Holdstock; 2, J. Dyde; 3, W. Peplar. DANIOS, WHITE CLOUDS & RASBORAS: 1, W. Holdstock; 2, A. Whatford; 3, Mrs. M. Hemming. BARBS: 1, W. Holdstock; 2 & 3, S. Samson. CATFISH: 1, D. Cannon; 2, S. Wismark; 3, M. Green. CICHLIDS: 1, M. Green; 2, D. Cannon; 3, Mrs. Hemming. CHARACINS: 1, A. Whatford; 2, Mrs. M. Hemming; 3, Mrs. E. Lynch. LYRE- OR SWORDTAIL GUPPIES: 1 & 2, C. Farmer; 3, M. Pavitt. ROUND-, SPEAR-, COFERTAIL OR ROBSON GUPPY: 1 & 2, P. Pavitt; 3, C. Farmer. FEMALE GUPPIES: 1, P. Pavitt; 2, C. Farmer; 3, M. Pavitt. A.O.S. TROP.: 1 & 2, R. Churchman; 3, Mrs. M. Hemming. PLANTS: 1, H. Harris; 2, R. Churchman; 3, C. Lacy.

Southend Annual Show Prizewinners

ALL trophies up for competition at the annual show of Southend, Leigh A.S. changed hands. Successful exhibitors were Mrs. Sweetenham (Flamboro' Cup, best tropical fish), Mrs. Penfold (Brooks Shield, best furnished aquarium), Mr. W. Hoare (Abbott Cup, highest points), Mr. G. Willis (Du Boisson Cup, best Black Widow, and Brooks Shield, runner-up in furnished aquaria), Mr. D. Connor (Coronation Cup, breeders' livebearers), Mr. I. Cotgrove (Barnes-Oake Cup, breeders' egglayers), Mrs. S. Greaves (Jones Cup, best coldwater fish), and Mr. G. Pryor (Saunders Cup, runner-up in coldwater fish classes).

PRIZEWINNERS

GUPPIES: 1, Mrs. Gibbs; 2, S. Layzell; 3, W. Hoare. A.O.S. LIVEBEARER: 1, Mrs. Penfold; 2 & 3, D. Connor. FIGHTERS: R. Barnes; 2, Mrs. Gibbs; 3, W. Hoare. GOURAMIES: 1, M. C. Mash; 2, W. Hoare; 3, A. Hayes. ZEBRAS: 1, P. Blomfield; 2, W. Hoare; 3, M. C. Mash. WHITE CLOUDS: 1 & 2, W. Hoare; 3, Mrs. Outing. BARBS: 1, M. C. Mash; 2, L. Willis; 3, S. Layzell. BLACK WIDOWS: 1, R. DuBoisson; 2, G. Willis; 3, P. Blomfield. A.O.S. CHARACIN: 1, R. DuBoisson; 2, P. Blomfield; 3, M. C. Mash. A.O.S. EGGLAYER: 1 & 3, W. Hoare; 2, L. Willis. ANGELS: 1, W. Hoare; 2, Mrs. Gibbs; 3, R. DuBoisson. A.O.S. CICHLID: 1, Mrs. Sweetenham; 2, R. DuBoisson; 3, H. Giles. COMMON GOLDF.: 1 & 2, W. Hoare; 3, M. C. Mash. BRISTOL SHUBUNKINS: 1 & 3, G. Pryor; 2, S. Greaves; A.O.V. FANCY GOLDF.: 1, M. C. Mash; 2 & 3, W. Hoare. COLDW. FISH: 1, S. Greaves; 2, J. McNaughton; 3, M. C. Mash. FURN. AQUARIA: 1, Mrs. Penfold; 2 & 3, G. Willis. BREEDERS' LIVE-BEARERS: 1 & 2, D. Connor; 3, W. Hoare. BREEDERS' EGGLAYERS: 1, I. Cotgrove; 2 & 3, R. DuBoisson.

F.B.A.S.—Quo Vadis?

ALTHOUGH the article by Capt. L. C. Betts under the above title in the August issue of WATER LIFE has been read "with interest and care" by at least one official of the Federation of British Aquatic Societies, an invitation to reply to the points raised has been declined. The decision reached has been approved by the Federation's Judges and Standards Committee. It is, however, pointed out by the secretary of that committee (Mr. J. H. Gloyn) that a basic points system for judging fishes for which no standards yet exist was published late in 1951 and was referred to at the first Judges' Conference held in March 1952. Under this system a maximum of 100 points are divided as follows:—Body 20, fins 20, size 20, colour 20, condition and deportment 20. With a general guide of this sort (always assuming, of course, that the judge is familiar with the characteristics of the particular fish he is called upon to judge), it is found that the resultant placings are fair. The system, which does not supplant the idea of separate standards but serves as a standby until further standards are evolved, is still regarded as provisional but experience is showing it to be practicable. The disadvantage is with the exhibitor who, having no standard outline and accompanying written guide to refer to, has nothing to tell him the grounds on which the judges allocate the points within the five divisions of up to 20 each.

Shubunkin Standards

MR. E. R. Blunsden of Westbury-on-Trym, well-known as a pioneer of the Bristol Shubunkin Standard, takes us to task over the caption to the front page of our last issue. He writes:—"I feel I must disagree with your statement that the Shubunkins shown on the cover of your August-September issue are representative of the Bristol Standard type. It is only necessary to compare them with the standard drawing. The top of the body should have an evenly increasing contour to the first ray of the dorsal; the dorsal fin should start at the highest point and the head should be rounded and in alignment with the body. In the fish depicted the head is too pointed; the top portion of the body shows a hump at the shoulders—a serious fault; the body is too deep and the tail not at all typical of the Bristol type. I doubt whether any competent judge of Shubunkins would consider giving such fish any award." We had been careful not to say that the fish were prizewinning Bristol Shus. Mr. L. E. Perkins, the photographer, points out that the lower specimen was bred from the strain produced by his brother (Mr. Norman Perkins), a member of the Goldfish Society. He adds "I see no reason for your correspondent to make comments. The luxuriant caudal and dorsal fins surely fit the fish for the Bristol rather than the London category?"

N.A.S. Council

IN readiness for the October A.G.M. the National Aquarists Society has invited nominations for President, vice-president, secretary and four Council members. The secretary (Mr. L. A. White) and Councillors W. C. Cleveland, C. R. Macdonald, A. C. Marjoram and A. W. Willson are due to retire but are eligible for re-election. The growing interest shown by members in the Society's happenings may mean that new names will be put forward and that some close figures in the postal ballot will result.

If the new vice-president is one of the existing Council members, at least five nominations for the four vacancies will be needed.

Good Progress in Guppy Federation's Membership Drive

Demise of N. Surrey Section — Eastern Counties Restricts its Numbers

AT the July Assembly of the Federation of Guppy Breeders' Societies Mr. Roach announced that he hoped there would shortly be 100 provisional members although numbers were depleted when new Sections were formed. Mr. Roach said that, despite the high cost of producing the Federation's bulletin, he would shortly ask for it to be enlarged so that its high standard could be maintained and reports and articles could continue to be included.

Increased overseas membership was also reported and there seemed a possibility of sections being formed in Canada, the United States and Southern Rhodesia.

Due to the expense involved, the idea of holding a Federation Convention had to be shelved but the management committee were going into the possibility of an overnight coach trip to Manchester or Southport being arranged so that London members and the committee could meet Northern Guppy fanciers.

The *N. Surrey Section* has ceased to exist and some of its members have joined the W. London Section whilst others have become provincial members. *South London Section* now meets at New Cross House, 316 New Cross Road, S.E.14. Officers elected at the Section's A.G.M. were: chairman, Mr. W. Howe; vice-chairman and treasurer, Mr. A. Littlewood; secretary, Mr. H. Pearson and show secretary, Mr. C. Collins. Membership of the *Eastern Counties Section* will be restricted to 40. This Section presented a cup for competition at the annual show in the Golden Female class. Messrs. D. Johnston and W. Myers have been presented with gold pins—a notable achievement.

At the September 12 Federation Assembly the trainee judges took their final examination and it was then decided to run a breeders' furnished aquaria contest in the Federation's Section of the forthcoming WATER LIFE Display.

Extreme pressure on space has resulted in reports of Southampton A.S., Portsmouth A.C., Romford A.S., Blackburn A.S., Midland A. & P.S., Nottingham A.S., Bethnal Green A.S., A.S.L.A.S., and East London A. & P.A. shows being held over until the next issue.

Netherlands Congress Welcomes Visiting Aquarists

THE Nederlandse Bond Aqua Terra held its first National Conference in August at Haarlem, the arrangements being in the capable hands of the Haarlemse Aquarium Vereniging. The project was well attended and several aquarists from the German Federation, from Belgium, England and from France were present.

On the first day the Conference assembled and after an introductory speech, went to the Town Hall, which dates from 1602, where they assembled in the famous Hall of Knights. The Deputy Burgomaster addressed the members and wished them every success with the Conference. He then went with the members to the other side of the Town square, where he officially opened the Haarlemse Aquarium Vereniging Show.

Next morning Mr. E. Prager, President of Haarlemse A.V., addressed members of the N.B.A.T. on their Federation's activities and their magazine "Het Aquarium". Mr. Tolk, vice-president of the N.B.A.T. formally declared the Conference open, and Mr. Keller, President of the German Federation, replied on behalf of representatives of other countries.

The next item was a colour film showing "Bettas" in all aspects of their lives; fighting, nestbuilding, mating and "bringing-up the family"; this film was made by Dr. Lodewyks, President of the N.B.A.T., who was unable to be present. Another colour film shown was loaned by the Hungarian Legation.

Prof. Dr. A. Stolk, gave a talk, illustrated by slides, on the "Embryonic Development of Livebearers". Prof. Stolk is not only a Doctor of Medicine but also of Biology. One point of special interest, was, that the sex organs can be destroyed by certain diseases.

Mr. Dubois gave a very interesting account, well illustrated with colour slides, about collecting fishes in the Belgian Congo. He was followed by Dr. A. Melchior who gave a talk illustrating the superstitions and beauty in East Africa. Mr. C. W. G. Creed of the Federation of British Aquatic Societies then gave his talk on "The English Way of Judging Tropicals". He explained the methods of showing fish, and pointed out that to date all our standards were based on cultivated fishes which had come under the influence of man. He stated that further standards were in course of production. He then explained, with the aid of charts, the English methods of pointing fishes and furnished aquaria.

After dinner the members were taken by coaches to a restaurant in the Haarlem woods where the rest of the evening was enjoyed in dancing and a cabaret show.

The Sunday proceedings were opened with a lecture by Dr. E. Meder of Germany on "Nature and Wildfishes". This proved to be a very stirring talk dealing with all aspects of Nature. Dr. Meder gave several hints on breeding unusual fishes such as *Cynolebias bellottii*, etc. Mr. H. Th. Snijders gave a talk round a collection of colour slides which were available to Federation Clubs, pointing out that with the aid of the slides many club members should be able to give a talk to members of their own clubs.

Dr. H. C. D. de Wit gave an instructive description of the *Cryptocoryne* plants, using some specimens to illustrate his points. Dr. P. A. Florschutz followed with an account of an expedition to Surinam. The final talk was given by Mr. Oskam on "Decorative Water Plants". This talk was illustrated with colour slides of furnished aquaria and plants. Hints were given on the growing of various types of plants, and how they could be used to best advantage in the aquarium.

The Conference was then closed by Mr. Prager. Dr. Kramer, of the German Federation, thanked the N.B.A.T. for their invitation to attend the Conference, and also mentioned about the friendly atmosphere which had prevailed throughout the Conference. He said that he had also been asked to express thanks on behalf of the representatives of the other countries present.

Haarlem Show

THE aquarium show staged by Haarlem A.V. to coincide with the N.B.A.T. Conference was held in the Old Fish Hall in the shadow of the Cathedral. This show was remarkable for the large size of the aquariums on display, those of three feet and four feet were most in evidence. One aquarium which held entries for the breeders' class contained about 1200 fishes of only three varieties. One of these was over 700 Penguins, or should we call them "Hockey-sticks"? the name by which they are known in Holland.

Mr. C. W. G. Creed, F.B.A.S. judge, had been invited to assist in judging the fish classes in conjunction with Dr. Merckens. The furnished aquaria classes were judged by Messrs. Oskam and Snijders.

BREEDERS (difficult): 1, Van Den Wateren, *Hyphessobrycon innesi*. 2, Wille, *H. heterorhabdus*. 3, Van Den Nieuwenhuizen, *Telmatherina ladigesi*. 4, Wille, *Rasbora maculata*. BREEDERS (not-so-difficult): 1, and 2, Wille, *Neolebias ansorgii* and *Thayeria obliqua*. 3, Van Laere, *Melanotænia nigrans*. 4, Ruurda, *Hyphessobrycon serpa*. SINGLE FISHES: 1 and Haarlem Prize donated by the Burgomaster, Van Den Nieuwenhuizen, *Telmatherina ladigesi*. 2, De Vries, *Apistogramma agassizi*. 3, Pieterse, Red Platy. 4, Prager, Red Betta. PAIRS: 1, Weydeman, Black Mollies. 2, Verdam, *Nannostomus anomalus*. 3, Prager, *Aplocheilus lineatus*. 4, De Vries, *Colisa lalia*.

FURNISHED (mixed): 1, Van Den Nieuwenhuizen. 2, Wille. 3, Heidweiller. FURNISHED (geographical): 1, Van Den Nieuwenhuizen. 2, Van Den Wateren. 3, Pieterse. The standard of the fishes shown was of a very high quality, and it was interesting to see tanks in the breeders' classes holding several hundreds of fishes. Entries for singles and pairs were shown in large tanks.

Trade Topics

West Bergholt Firm's Enterprising Move

MESSRS. Whitwell and Smykala and The Scottish Fisheries held open house to the trade at the end of August in the London premises of Scottish Fisheries (Kentish Town). The primary purpose was to herald the opening of a London wholesale fish branch of Messrs. Whitwell and Smykala at The Scottish Fisheries' London premises in 61, Grafton Road, Kentish Town.

An entire room has been devoted to the Whitwell and Smykala enterprise, the tanks being arranged behind facia boarding on an island site. The advantage is that prospective trade customers can then view the exhibits uninterrupted for the servicing is done from behind the aquariums. As far as possible all fish will be those bred at the partners' West Bergholt fish hatchery. Certainly all the fish on show at the preview were home-bred and included Flying Barbs (*Esomus danricus*), *Apistogramma reitzigi*, *A. ramirezi*, Lemon Tetras (*Hyphessobrycon pulchripinnis*), Orange Chromides (*Etroplus maculatus*), *Pachypanchax playfairii*, *Hyphessobrycon rosaceus*, *H. heterorhabdus* and *Hemigrammus pulcher*. In all there were 34 distinct species in the 43 aquariums and eventually it is hoped to have a different species in each tank. The fish arrive when 10 weeks old and then come under the charge of Mrs. Gotts, for six years a worker in the W. Bergholt hatchery. Aquariums are space-heated by means of central heating and livefood arrives periodically from the Colchester area.

Scottish Fisheries took the opportunity to introduce some of their new lines including plastic aerator accessories (T-pieces and T-regulators in multiple units) and the attractive, modestly-priced Zephyr pump.

Queensborough Fisheries

THE hours of business of Messrs. Queensborough Fisheries appeared incorrectly on the back cover of the last issue. They should read:— Shepherds Bush branch, Monday to Saturday, 9 a.m. to 6.30 p.m., excepting Thursday when the times are 9 a.m.-1 p.m.; Picton Place branch, Monday to Saturday 9.30 a.m.-6 p.m.

Bargains in Brussels

by J. H. P. Brymer

ANY aquarist passing through Belgium on business or holiday should make sure that he finds time to go round at least one of the tropical fish dealers' shops in Brussels. The size of the fish offered and their relatively low cost are unequalled anywhere in Europe with the possible exception of Hamburg.

The first shop of this nature encountered by me was close to the town terminus for coaches from the airport. Called "Equatoria" and located at 8, Rue St. Lazare, St. José (Nord), it is owned by the genial Monsieur Jean Germann and his wife. This excellent little establishment not only retails fishes at what seemed the lowest prices anywhere but also foreign finches, cacti and succulents. Jean caters chiefly for the collector and breeder, rare varieties for the former and good-sized fish for the latter—fish which would carry away high-class prizes in England. Among his prices were Neons, *Ambassis* and *Neolebias* at the equivalent of four shillings each; *Corydoras paleatus*, *C. æneus*, *Trichopsis vittatus* and *Glaridichthys falcatus* at about three and sixpence.

Collection of Gadgets

Situated in the main shopping area of the city is "L'Aquarium" at 36 Rue de Lombard. This house had a remarkable selection of aquarium gadgets for sale, many of considerable ingenuity. Among the fishes stocked I could not fail to notice *Nannostomus* at three and sixpence and beautiful examples of *Rasbora heteromorpha* and *Hyphessobrycon rosaceus* at six shillings. Various livefoods (some completely strange), snakes, lizards, newts (half-a-dozen species), turtles, alligators, and apparatus for entomologists were obtainable here. A remarkable library of natural history books covered almost every aspect of the various branches of natural science.

Another shop of interest is "Aquatic" which has two houses in the central shopping thoroughfares: 71, Boulevarde M. Lemmonier and 1 Avenue Brugmann. Although no particularly unusual species were displayed, almost all the familiar ones were available in quantity, being mature fish of good colour and superior size.

Somewhat off the beaten track, but patronised by native collectors, is "Aquacultur". This little establishment more than compensates for its small size by the fact that most of the items for sale are scarce with an occasionally really rare example of fish or plant. All are at a bargain price. At the time of my visit many species of Sucker Catfish were to be had; one example was *Plecostomus plecostomus*, about 9 or 10 in. long and costing about one pound. A keen hobbyist should visit "Aquacultur". The address is 122 Rue Chaussée de Forêt, and tramcars 81 or 83 from the city centre will drop one within one hundred yards of its rather unspectacular portals.

Many Characin Species

Finally, there is Monsieur Weirauch's retail premises named "L'Exotique" at 34 Place de Liedts (10 minutes walk from Jean Germann's shop). Here are quality fishes in enormous quantities. Practically all the Tetras listed by Innes were there by the hundred and many are bred in the basement. One or two rarities also creep in and the writer was lucky to observe two African species in *Ephippicharax orbicularis* (anal fin is attenuated and the outside edge is ribboned in black) and *Pelmatochromis* species. Monsieur Weirauch has bred Neons, *Aphyosemion australe*, *Poecilobrycon auratus* and *Hyphessobrycon gracilis*.

Typical average prices for some species in Brussels are:—*Badis badis* (3s.); Bettas, *Microhausia*, *Corydoras*, *Melanotænia*, *Barbus cumingi*; *Glaridichthys falcatus* (all at 4s.); Large Sailfin Mollies, *Esomus danricus*, *Nannostomus anomalus* and Neons (7s.). Large phials of Brine Shrimp ova (2/6).

The visitor returning to England can be reasonably certain that the Customs will not stop importation or charge duty so long as not more than a dozen or so are brought in and provided the fish are not being imported into this country for retail purposes.

Visit Paid by Eminent Aquarist from Australia

PROFESSOR C. W. EMMENS, Professor of Veterinary Physiology at the University of Sydney and a keen aquarist in that town visited this country during August whilst on a world business tour. *En route* he was able to contact many aquarists including fish exporters in Singapore, Mr. Rodney Jonklaas of the Zoological Gardens, Ceylon, and Mr. Robert Andrews, McLynn's Aquarium, St. Martin's Aquaria and the Kingsland Fisheries, in and around London. A visit to the Enterprise A.S. show was also fitted in.

Professor Emmens is a keen keeper and breeder of tropical fish, both freshwater and marine. Glowlights he has bred by the thousand and he also has had some success with Neons and Sea-horses. He is a staunch advocate of sterile tank conditions when fish breeding is being attempted. The vast majority of tropical species can take Brine Shrimp or Mikro-worms as their first food, he maintains, and, with only few exceptions, the introduction of Infusoria in any form is quite unnecessary. Even when Shrimps and Mikro are too large as an early food—in the case of Zebra Danios and Dwarf Gouramies etc. —pure *Paramecium* cultures are used by him. He thinks that many unsuccessful breeding attempts are due to Infusoria cultures, brewed on the recognised lines, being responsible for the introduction of predators and disease.

In Australia the hobby moves apace, and it was given a terrific fillip when the ban on the importation of tropical fish by air was lifted less than two years ago. There are now over 300 members in the New South Wales society and a conservative estimate of the numbers of tropical aquarists in Sydney is 30,000-40,000.

Prices of imported fish are high but Australian fishbreeders get quick breeding successes with most of the egglayers, including the more difficult types like *H. serpa* and Glowlights.

Sydney aquarists are fortunate in that usually their tap water is soft, but in Brisbane the position is reversed and the water is hard and alkaline. In Sydney many tropical fish are kept in ponds throughout the warmer months from September to May and some, such as Rosy and Ticto Barbs, breed prolifically under such conditions. A number of aquarists leave Swordtails and Mollies, etc. in ponds all the year round but then some losses are encountered. Generally speaking Professor Emmens found the livebearing fish in Gt. Britain superior but most of the egglayers he thought were better in Australia although he was impressed by the Dwarf Gouramies at Enterprise show.

Leaving this country at the end of August he planned to call in at the New York Aquarium, the Shedd Aquarium (Chicago) and Mr. Gene Wolfsheimer of Los Angeles before returning to his own country at the beginning of October.

London's New Aquarium

Good Progress at South Bank

THE London County Council is anxious to make the best possible use of the Festival of Britain site at South Bank, and it is showing considerable interest in the new public aquarium which is nearing completion there.

Situated beneath the approaches to Waterloo Bridge and facing the Festival Hall, the Aquarium covers 8,000 square feet. Near to the river, Waterloo railway station, the British European Airways coach station and within easy reach of the north side of the river, this new venture is likely to attract patronage not only from the many visitors to the Metropolis but from Londoners themselves.

The curator will be Mr. Eric A. Bowler. The policy of the promoters is an ambitious one and it is intended not only to provide a collection of fishes that will interest the casual visitor but also the more knowledgeable aquarist. Special emphasis is being laid on the cultural value of the exhibition and it is planned to admit regularly parties of schoolchildren. At times, lectures will be given on different aquatic life subjects by leading men and women in their field and there will, it is hoped, be room for competitive shows.

A visit paid to the Aquarium a few weeks ago showed that rapid progress was being made, the stands and facings being in place ready to accommodate well over 100 large aquaria. Tropical and cold freshwater and marine fish are to be on show and the exhibits will be changed frequently, room being made for new specimens as they are received from different parts of the world.

The principal aims are to make the venture a Mecca for the fishkeeper and a place where members of the lay public can be introduced to the hobby. There is room to keep a large reserve stock of fishes and for breeding from them. The opening date will be announced soon and London will have a centre to which visiting clubs can go and where instructive talks can be heard by the general public on the fascination of fishkeeping.

F.N.A.S. Twelfth Assembly

THE Twelfth (Autumn) Assembly of the Federation of Northern Aquarium Societies will be held at the Zoological Gardens, Belle Vue, Manchester, on Sunday, October 4.

The main part of the day's programme takes place in the Coronation Ballroom at 3 p.m., when Mr. F. Bates, of Newcastle-upon-Tyne A.S., speaks on "The Genus *Aphyosemion*", followed by Dr. F. N. Ghadially of the Pathology Department, University of Sheffield, who will give an illustrated lecture on "Some Diseases of Tropical Fish". At 6.30 p.m. a film show will be held.

"A STEADY PRESSURE ON THE BOTTOM GLASS"—WELL, THAT'S WHAT THE LECTURER SAID!

Trade stands will be open in the Pagoda Tearoom from 11 a.m., and the Belle Vue Zoo and Aquarium will be open to visitors all through the day. Tickets for the lectures and film show can be obtained from Mr. H. Ashbrooke, 38, Broady Street, Stretford, price 2/6 each. It should be noted that the price of meals is *not* included but they can be booked on application to the Catering Manager, Belle Vue (Manchester) Ltd., Zoological Gardens, Belle Vue, Manchester 12.

Lecture by Mr. J. W. Lester

AMONG the free Saturday afternoon lectures given in the Horniman Museum, London Road, Forest Hill, S.E.23, is one on "Reptiles: Crocodiles and Snakes" by Mr. J. W. Lester, F.L.S., on October 17. Mr. Lester is the Curator of Reptiles at London Zoo and he will illustrate his talk, commencing at 3.30 p.m., with colour

F.B.A.S. Insurance Scheme

Leading Company Offers Aquarists Cover Against Losses

WE referred in our last issue to negotiations which had been progressing between the Federation of British Aquatic Societies and an assurance company. An agreement was reached and a scheme is now in operation whereby aquarists, whether affiliated to the F.B.A.S. or not, are able to have full insurance cover for their aquaria, accessories and aquatic contents. Trophies, regalia and similar property owned or held by aquarists can also be insured.

The company, the Union Assurance Society Ltd., undertakes to issue policies of insurance against the risk of fire, theft and accidental external damage, including the loss of contents due to the failure of the heating, aeration or thermostatic apparatus, in connection with aquaria and accessories of proprietary make and the contents of the aquaria. There are five provisions made by the company, two being that it shall not be liable for (a) any single article of the aquatic contents exceeding 10/- in value unless separately specified and valued or (b) the first £1 of any loss or damage not due to fire or theft.

Forms Now Available

Proposal forms, which give further details of the scheme, can be obtained from Mr. R. O. B. List, F.B.A.S. secretary, 1, Coronation Court, Willesden Lane, London, N.W.6. They must be returned to him on completion.

The premium is at the annual rate of 25 per cent, subject to a minimum of £1. In other words, at least £1 is payable before a policy will be issued, that sum covering aquaria, accessories and contents up to the value of £80. Where the value of the items to be insured is higher, the cost per £100 is 25/- and *pro rata*. For example, if the aquarist values his aquaria, etc. at £175, the premium payable will be £2 3s. 9d. It is important to note that the conditions apply only to aquaria of "standard size" (such sizes are not specified by the insurers but, presumably, 18×12×10, 24×12×12, 24×15×12, 36×15×12, 36×12×12 in. and similar popular sizes would be accepted) and to owners who possess not more than five aquaria. Terms for those whose property does not come within these limits will be quoted on application.

Fossilised Shells Found in Salisbury Area

THE British Museum (Natural History) has come into possession of some remarkably well-preserved fossilised specimens of the oyster, *Ostrea vesiculosa* (J. Sowerby). They were discovered in the Upper Albian (Upper Greensand), Lower *Pecten asper* zone, at Chapel Copse, near Ridge Farm, Chilmark, Wilts., farmed by Mr. Derek Branford. When first discovered, great interest in them was shown by Dr. L. R. Cox, M.A., Sc.D., who identified them and accepted 25 specimens from the finder for retention by the Museum authorities. The many shells are to be seen in a seam estimated to be some 450 ft. above sea level. The situation of the seam is in a lane leading to a height known locally as Ridge Hill, the summit of which is appoximately 500 ft. above sea level. They were discovered when a cutting was made through the hill, revealing a surface layer of green sand to a depth of 18 in., below which is a layer of gravel. The fossils show that at some time in the past (known from other evidence to be about 100 million years ago) this part of the country was submerged under the sea. The seam, it would appear, was at one time a shallow sea floor where the creatures in the shells must have lived in abundance. Why the sea floor should have been so densely populated by *Ostrea vesiculosa*, yet apparently no other species were present, is hard to understand. The bed is undulating and of a uniform depth of 18 in.

Such finds as this have enabled geologists to reconstruct the successive changes in the face of the earth which have taken place during the ages. There are few parts of England, even those now forming the highest ground, which have not been submerged under the sea again and again

Club Notes and News

The Editor invites clubs to send brief reports of meetings and announcements of forthcoming events for publication. Items for the December-January issue should reach this office by November 12.

NEW address of Mr. R. Whitehead, secretary of **Peterborough A.S.**, is 32 Low Cross, Whittlesey, Near Peterborough, Northants. The society would be pleased to exchange its monthly journal with other clubs producing similar bulletins. Mr. R. Hughes spoke on "Keeping of Reptiles and Amphibians" at the August meeting and Mr. C. W. G. Creed gave a lecture on "Plants for Aquaria" at the September fixture. The club's annual dinner is scheduled for December.

BEST fish in show at the **Blackburn A.S.** August 12 exhibition was a Calico Veiltail shown by Mr. S. Walsh. This exhibitor received a WATER LIFE diploma.

PRIZE distribution and a social evening were arranged for September 29 by **Nottingham A.S.** following the annual show at the beginning of the month. In the annual contest between junior members of the Nottingham and Leicester societies, Nottingham was the winner with 34 points to Leicester's 31.

THE establishment of Messrs. Whitwell and Smykala was visited by **Kettering A.S.** for their annual outing.

OFFICERS of the **Stourbridge A.S.** elected at the August 13 A.G.M. were Mr. D. Hibbard, chairman; Mr. F. V. Hillman, secretary and Mr. Digger, treasurer. At the last three meetings a number of members have given short talks on various aspects of fishkeeping.

ANNUAL show of **Chingford A.A.S.** was held on September 19.

ON August 3 **Nuneaton P. & A.S.** staged a show in which Messrs. R. Cotton and H. Beasley's furnished aquarium was adjudged the best furnished tank and awarded a WATER LIFE diploma.

MR. F. King, 14 Lonsdale Avenue, East Ham, London, E.6, is hoping to form a new society in the **East London** area and invites keen aquarists interested in the keeping and breeding of tropical egglaying fish to contact him.

RECENTLY-APPOINTED secretary of **Hounslow A.S.** is Mr. G. Vance, 7 Abinger Gardens, Isleworth, Middx.

MR. W. E. SMYTH, 3 Strode Road, Stamshaw, Portsmouth, Hants., has been elected secretary of **Portsmouth A.C.**

A QUIZ was arranged for the September 9 meeting of **Bedford A.S.**

REACTIONS to the society's show were given by members at the August 19 meeting of **Southend, Leigh A.S.**

A VARIED programme is being enjoyed by members of **Riverside (Hammersmith) A.S.** It includes table shows, lectures and discussion groups.

TABLE show winners at the August 20 meeting of **E. Midland G.B.S.** were Messrs. W. Burwell and J. Rudkin. Six tanks containing Guppies were staged at the Leicester society's annual show.

THE fourth annual open show of **Accrington A.S.** was held from September 3-6. WATER LIFE diploma for best furnished aquaria went to Mrs. D. Loder.

THE **Dewsbury A.S.** staged a show on September 12.

A SHOW of furnished aquaria was put on by **Northampton A.S.** from August 19-22. The best tank was set up by Mr. W. H. Snedker who won a WATER LIFE diploma.

IN conjunction with the Southall Borough Show at the beginning of August, **Southall A.S.** staged its 1953 show.

"FEEDING and Sexing Fishes" was the title of a talk given by Mr. H. Loder at the August meeting of **Nelson A.S.**

DURING the summer **Kings Lynn A.S.** members visited McLynn's Aquarium at Ewhurst and were impressed with the set-up. At the August meeting Mr. G. D. Watts,

Photograph] [*L. E. Day*

Mrs. E. I. Gibbs, winner of the Southend, Leigh, society's home aquaria contest and therefore awarded the Giles Cup for the current year.

B.A., spoke on "Simplified Genetics" and then assisted Mr. A. J. Staden, B.A., in judging a table show. The September meeting was primarily a social gathering. Members will give short talks at the October fixture and on November 4 Mr. R. O. B. List is scheduled to speak on "Tropical Plants."

NINETEEN classes were scheduled for the third annual show of **Oldham A.S.** held from September 23-26. Judges were Messrs. R. E. Legge and A. Snape.

A WATER LIFE diploma will be up for competition at this year's show of **Mid-Somerset A.S.** Secretary is Mr. D. H. Wills, 2 Cranleigh Gardens, Bridgwater, Somerset.

NEW secretary of **Brighton & Hove A.S.** is Mr. R. V. Cheal, 32 Park Crescent, Brighton, Sussex.

MR. WALKER judged the display put on by **Bexhill A.S.** as part of the local summer flower show. Chief prizewinner was Mr. J. W. Willcocks. At the August 13 meeting Mr. Walker discussed exhibits at the show. Mr. H. C. Pepper judged a table show for Characins won by Mr. J. W. Willcocks at the September meeting. An aquarium has been presented to the Ellendene Children's Home.

EXHIBITOR showing the best furnished aquarium at the **Bolton A.P. & M.S.** Coronation show was Mr. R. Scott who won a WATER LIFE diploma.

MISS R. PATRICK was the first prizewinner in a coldwater table show staged at the August meeting of **W. Surrey P. & A.C.** At the same fixture members gave short talks on their fishkeeping experiences.

ON August 29 **Swansea A.S.** staged an exhibition.

NEW meeting place of **Chelsea A.S.** is "The Rose," 86 Fulham Road, London, S.W.3.

EACH member of the newly-formed **Lancashire Aquatic Breeders' Society** must be a breeder of aquarium fish. The first show will be held in the Spinners' Hall, Bolton, on November 14. Schedules are obtainable from Mr. J. Duckworth, 534 Plodder Lane, Bolton. Applications for membership of the new club should be made to Mr. M. Close, 23 Jauntsey Street, Bolton.

THE third annual show of **Hartlepools A.S.** was held from September 9-12 when a WATER LIFE diploma was up for competition.

A FURNISHED aquaria class was staged by the **Ashton-under-Lyne A.S.** at the Ashton Horticultural Show on September 12-13. A silver trophy and special prizes were competed for.

DR. F. N. GHADIALLY'S film on the Brown Acara was shown at the September 18 meeting of **Winchester City Aquarists.**

A *Monodactylus argenteus* owned by Mr. G. Taylor was the best fish in show at **Shelf A.S.** July 22 exhibition. This exhibitor was awarded a WATER LIFE diploma by the judges, Messrs. E. Chapman and H. Loder.

(*Continued next page.*)

Compensation for East Coast Flood Damage

F.B.A.S. Appeal Fund Used to Replace Losses

THE total received in donations to the Flood Appeal fund, launched by the Federation of British Aquatic Societies to help aquarists affected by last February's disastrous floods, amounted to £93 8s. 6d. A number of claims were received and after local investigations they were divided into three main groups and one individual.

The Council of the F.B.A.S. first allocated £75 to the three groups (Isle of Sheppey £15, Kings Lynn £30 and Great Yarmouth £30) and £3 to the individual loser who came from Tilbury. Kings Lynn intimated that they wished to accept only £15 as they desired others more unfortunately placed to receive help. Subsequently a sum of £15 was donated to the fund organised by the Nederlandse Bond Aqua Terra to help the many Dutch aquarists who had experienced losses. The small remaining balance has been put into a separate account to meet any belated claim or to increase one of the allocations.

Altogether, excluding the money sent to Holland, 17 individual aquarists have been given material assistance, £63 being divided amongst them. This sum has helped them to re-establish themselves as aquarists, although of course it was not possible to compensate them for anything like 100 per cent of the losses sustained. For example, from one of the assisted areas two aquarists had stock destroyed to the agreed value of over £75. Nevertheless, the help given has been most gratefully received and has done much to encourage the recipients to make a new start.

It is worth recording that of the three areas helped only one (Kings Lynn) has a society affiliated to the Federation. As Mr. R. O. B. List, the secretary, states "The others are outside our normal orbit but have been helped and rightly so." The response to the appeal shows the excellent spirit that prevails in our hobby".

Club Notes and News

(continued.)

A HOME aquaria competition is being run by **Rochdale A.S.** at the end of October. Several displays of aquaria have been put on recently.

MEETINGS of **Llantwit Major A.S.** are held in the Cross Keys Hotel on the second and fourth Wednesday of each month from October to March. Interested fanciers in the area should contact the secretary, Mr. R. S. Wigg, 17 Ham Lane South, Llantwit Major, Glam.

IN the recent inter-society table show between **Huddersfield A.S.** and the Bradford club, Bradford was the winner. Best fish in show was staged by Mrs. G. Priestley. Huddersfield also participated in an inter-club table show with Halifax A.S. and won by 28 points to Halifax's 19. Best fish in show was Master P. Whitecross's Nigger Barb. Annual show of the Huddersfield club runs from September 26-October 3 in the Springwood Parochial Hall, Springwood Street, Huddersfield.

AS part of the display put on by **Worcester A.S.** at the Worcester Horticultural Show there was a waterfall and several community aquariums. Meetings are held on the second Monday of each month in the Co-operative Social Club, High Street, Worcester.

NEW secretary of **Feltham A.S.** is Mrs. R. Aldridge, 174 Uxbridge Road, Feltham, Middlesex.

THE annual show of **Oakwood Hospital A.S. (Maidstone)** was held in conjunction with the hospital flower show on August 22. Mr. C. W. G. Creed judged the 18 entries. Class winners were W. Kent A. & P.A., Mr. D. Whittaker and Mr. W. Fish. The W. Kent A. & P.A. was awarded the inter-club shield.

NEW secretary of **Stonehouse A.S.** is Mr. T. N. Artus, 21 Dudbridge Hill, Stroud, Glos.

WINNERS of WATER LIFE diplomas at **Bournemouth A.C.** show were Messrs. E. C. Golesworthy and C. G. Woodward.

TEMPORARY secretary of **Tottenham A.S.** is Mr. R. Browett, 37 Oakdale Road, Finsbury Park, London, N.4. Mr. J. W. Southall will speak on "Speckled Mollies" at the October 9 meeting.

MAIN awards at the annual show of **Leicester A.S.** went to Messrs. Calver, H. R. Ward, Byrne and Ballard. Judges were Messrs. Pullon and A. Wilson Smith. A film show has been arranged for the October meeting and during September Mr. Burwell spoke on "Aquarium Pioneers."

THE **Bradford A.S.** is to put on a show in the Mechanics' Institute, Bradford, from October 13-17.

THE **Huntingdon A.S.** staged a display at the Huntingdon Trades Fair running from September 9-12.

AT the beginning of August **Halifax A.S.** had a field outing to Grassington and Burnsall, where the river and ponds were examined.

RECENT activities of **Kingston A.S.** have included a 50-entry table show, a visit to London Zoo and a talk by Mr. Boyce on "Reptiles."

MRS. MEADOWS has spoken at a meeting of **W. Middlesex A.S.** and on August 18 Mr. C. J. Saunders, B.Sc., was the lecturer. First prizewinners at the last two table shows were Mrs. E. Brown and Mr. A. H. Charles.

AT a recent meeting of **Hastings & St. Leonards A.S.** members spoke on their fishbreeding experiences. The club staged a show during September and, shortly before this event, 10 tanks were set up in a Hobbies Exhibition during the local carnival week.

WINNER of the Founders' Cup and WATER LIFE diploma at the annual show of **Urmston A.S.** was Mr. E. A. Goodwin who exhibited in the furnished aquaria class.

AT a recent meeting of the **North Herts. A.S.** a novel miniature furnished aquarium contest was held. Tanks used were 12 × 10 × 8 in. and exhibitors were allowed only half-an-hour for setting up. The judge was Mr. J. H. Gloyn and first prizewinner was Mrs. E. Cooke.

THE comparatively-new **Gainsborough A.S.** staged a Coronation exhibition of tropical and coldwater fish recently. It consisted of over 30 aquariums and three special exhibits.

MRS. C. GRIFFITHS staged the best fish in show (a Bloodfin) at the **Burton A.S.** July exhibition.

SOME confusion has arisen concerning the **Friends (Herne Hill) A.S.** The club's title is only intended to imply that the club activities have a fraternal atmosphere. Recent lecturers have been Messrs. Webster, Holland and P. Hewitt. The last table show for Catfish was won by Mr. Browne.

AN aquarists' section has been formed within the **Yiewsley & W. Drayton Community Association.** Acting secretary is Mr. J. A. Macdonald, Community Centre, Bentinck Road, Yiewsley, Middx.

MR. W. BLACKBURN, 19 Ridings Avenue, Smithies, Barnsley, is the newly-appointed secretary of **Barnsley A.S.**

TWENTY tanks of coldwater and tropical fish, as well as reptiles, were staged in the marquee display of **Sleaford A.S.** at the annual show of Sleaford Garden-holders' Association.

Aquatic Traders' Association

WE referred in our last issue to the open meeting called by the Aquatic Traders' Association at which those present unanimously carried the motion that "The Aquatic trade is capable of expansion". A number of matters were discussed at length and the following resolutions were defeated after debate:—(a) The trade is adversely affected by excessive purchase tax on heaters and aquariums; (b) "Backroom boys" dealing in equipment constitute unfair competition; (c) The prices of aquarium commodities, to the public, were too high; (d) The retail trade received discounts which were excessive.

Motions that were adopted included:—(i) There was a lack of co-operation and cohesion, which was, in part, exemplified by price cutting and discounts given to retailers which were intended for wholesalers; (ii) Dirty shops, poor display work and lack of initiative generally by some retail traders adversely affect the trade; (iii) There is a falling off of interest in the hobby by the buying public; (iv) The trade is experiencing a recession; (v) There was a lack of support for the organised hobby on the part of the trade; (vi) The trade failed to organise sufficient national publicity.

In response to the chairman's call for suggestions to put the house of the trade in order, the following ideas were proposed:—To start a publicity campaign and consider the appointment of a public relations officer; to issue diplomas to capable and efficient traders; to organise a trade show, a display week and a display shop; to enforce agreed discounts.

THE **Crawley A.S.** participated in a local pet show on September 12. Approximately 50 furnished aquariums were displayed and also some individual competitive entries.

DURING September **Blackpool & Fylde A.S.** held its third annual show.

ON September 2 **Aylesbury A.A.** staged a table show of tropical fish.

Water Life Diplomas

WINNERS at recent shows of diplomas presented by WATER LIFE include:—Amersham Grove A.C.: A. Gregor (best furnished tropical aquarium). Southampton A.S.: P. L. Burden (best fish in show with a *Geophagus brasiliensis*) and H. Gilbert (best coldwater fish with a Fantail). Blackpool and Fylde A.S.: J. R. Shaw (best fish in show, with a Black Widow). These attractive diplomas are offered at both open and members' shows. Societies promoting such events are invited to make application for one (for confined shows) or two (where the schedule includes an open section). Where possible, they should be allocated to the best fish in show or for an equally good achievement.

WATER LIFE show stationery, including tank labels and prize cards, makes a secretary's life easier! Societies that hold shows should send for a price list now. Stock lines can be provided by return. Prize cards overprinted can be supplied within seven to ten days.

Photograph] *[Studio Moderne*

View of the well-staged Southall A.S. 1953 exhibition held in conjunction with the local borough show at the beginning of August.

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

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

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Fish—*continued*

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HYGROPHILA 3d; Vallis. spiralis 3d.; Torta 4d.; Floating Fern 4d.; Amazon Sword 2/6; Chain Sword 1/-; Planting Sticks 1/6; Micro Worm Culture 2/-; White Worm Culture 2/-, both with instructions. Roland Scott, 147, Derby Street, Bolton.

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PLANTS.—Hygrophila, Hornwort, Salvinia, Sagittaria natans, Subulata, Microfolia, 4d. Lysimachia, Vallisneria torta, spiralis, Hair Grass, 6d. Ludwigia, Myriophyllum, Cabomba, Ambulia, 8d. Four-leafed Clover, Indian Fern, 1/-. Giant Sagittaria, 2/-. Cryptocorynes:—Willisii, Beckettii, Cordata, Amazon Swords 2/6, Aponogetons;—Undulatum, Ulvaceous, 3/6. Cryptocoryne Griffithii, Red Water Lily, 5/-. Snails:—Ampularia, 6 for 2/-; Stagnalis, 3d. Malayan Sand, 4d.—Reeds, 10, Salisbury Road, New Malden, Surrey.

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PYTHONS wanted in all varieties. Write stating full details, to: Alan Robertson, Morison House, South Learmonth Gardens, Edinburgh. Telephone 34732.

Continued next page

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Sagittaria natans	4d.
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Ludwigia	6d.
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Spatterdock	2/6
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SPECIAL OFFERS

12 Vallis spiralis
12 Vallis torta
12 Sagittaria natans
1 Spatterdock
For 10/- post free

2 C. Beckettii
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1 Aponogeton
2 Spatterdock
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