

The AQUARIST AND PONDKEEPER

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1959

Editorial

IT has happened many times that the result of a casual hunt for "tiddlers" in childhood has been the foundation of a life-long interest in aquarium-keeping. The child who tries to keep his catches in the traditional jam-jar is frequently led to enquire into the proper ways of maintaining fishes and so takes the first steps to becoming an aquarist. It is of interest to us, then, when we hear of someone demanding the prosecution of children who net fishes, as was widely reported last month. Mr. Stanley Tomkins of Bournemouth has asked the Avon and Dorset River Board to take action under their bye-laws against "jam-jar fishermen," who, he says, catch "thousands of valuable fish" such as salmon and trout as part of their bag of "tiddlers" each year from the River Stour.

The River Board Fisheries Committee appears, fortunately, to take a much more balanced view of the matter, and has mentioned the possibility of the distribution of printed cards depicting various fishes so that young fishermen can differentiate between their catches. Certainly on some rivers these catches must contribute to the reduction in numbers of fishes reaching maturity from the fry stage, but this surely must be looked at proportionately. The figures for losses occurring from predatory fishes and river mammals and from kingfishers, herons and gulls would make the score to the youngsters look ridiculous. In fact, we are not at all sure that Mr. Tomkins would not be amply repaid in encouraging children to his river banks for their efficiency as bird-scarers.

IN April this year we published a letter from a reader and contributor, Mr. J. Kelly, who appealed from his own sick-bed for books and other literature on fish-keeping for his fellow-patients in hospital. The response to this appeal was magnificent. Mr. Kelly has told us that, when the correspondence began to flow in, the postman delivering the large mail assumed that he was a film star! Well over 500 replies were received to the appeal. This is most gratifying, and we are proud to record this generosity of our readers.

ADAPTATIONS

by LAURENCE E. PERKINS

I ALWAYS experience a little thrill when, on visiting a friend, I am shown some ingenious and simple adaptation of a commonplace article to a use far removed from that for which it was intended. The thrill springs from the originality of the idea and the knowledge that one may easily imitate what has been done and pay the inventor a compliment by so doing. Three such ideas which I have recently seen may well be worth passing on.

The first will appeal to those who would like some form of aquarium as a centerpiece for the table, for which purpose the angular nature of an orthodox aquarium is aesthetically unsuited. The impractical nature of the goldfish bowl has, happily, resulted in its almost complete disappearance but its erstwhile popularity would, I think, have been less long-lived had it not been for the undoubted attraction inherent in its symmetry. In the matter of design, curves usually have something over angles, and for the purpose under discussion a circular shape is what is most desired. Consider therefore the sandwich cover, a familiar enough article in railway buffets and restaurants, but rarely likely to be associated with the keeping of fishes owing to its invariably inverted position. Coming in a variety of sizes, up to about 10 in. or 12 in. in diameter, their straight sides, good-quality glass and ample surface area recommend them to the aquarist. The large, solid glass knob which serves as a handle when used as a sandwich cover may, at first sight, present a problem, but it can actually become a useful adjunct to the eventual stability of the finished aquarium. A large block of wood for a base or plinth can be shaped to a circular, hexagonal or octagonal form and a hole drilled or gouged in the centre of sufficient size to admit the glass knob. A baize covering for the bottom of the plinth or the attachment of four or six little rubber feet completes the job, only planting and stocking being necessary to furnish



An old metal container sunk in the ground can be concealed with rocks around its top edge and by moisture-loving plants

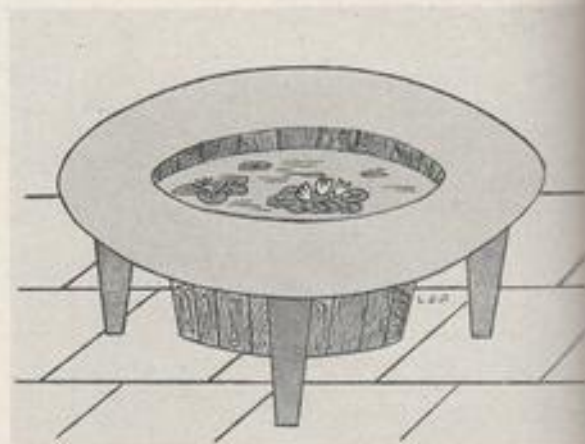
the owner with a scintillating, wholly glass aquarium.

The second utilitarian article is one not so often seen these days and therefore not so readily obtained other than from junk-yards or from those large antique shops which form such an interesting feature of most of our small country towns. I refer here to the old-fashioned copper vessel of some 8 to 10 gallons capacity. It may seem ludicrous to suggest utilising such a small container as a fish pond, but with a little care and enthusiasm a very ornamental corner may be made in a small garden where space is so limited that none can be spared for a pond in the true sense of the word. The "copper-pond" I have in mind supports a pair of brilliant goldfish and a small colony of frogs and sports its own tiny "water lily" in the shape of frogbit (*Hydrocharis morsus-ranae*). If rocks are carefully arranged around the edge the too symmetrical outline can be disguised, and the crevices between the rocks can be planted with quick-growing simple plants such as stonecrop, saxifrage, creeping-Jenny and "mind your own business," and a fern or two, Solomon's seal and lilies of the valley can be used to form a thicket at the back to which the frogs will like to retreat in the event of strong sunshine.

(continued on facing page)



New use for a glass sandwich cover. The method of recessing the plinth to take the knob of the glass is shown in broken lines



A novel garden table, with aquatic centrepiece, made from an old tub

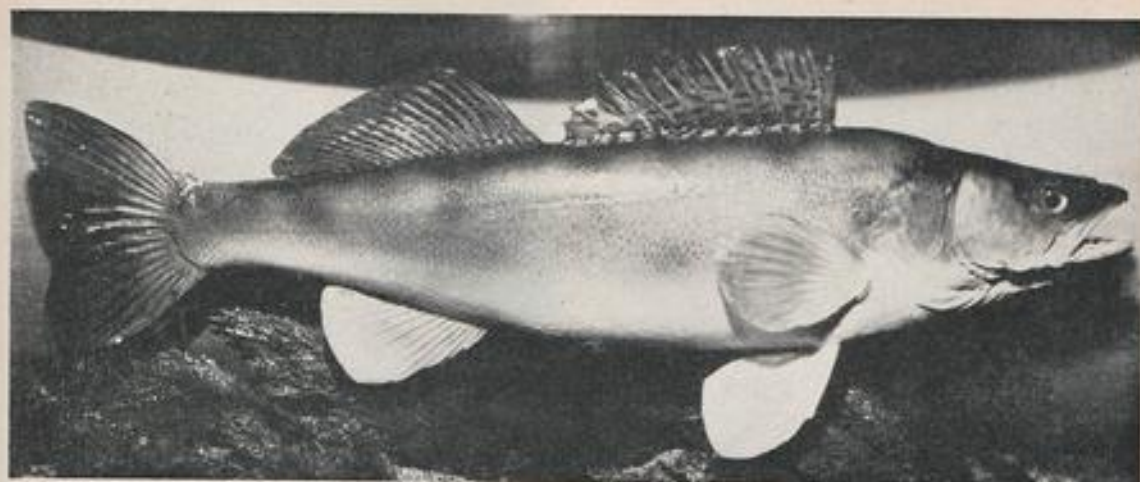


Photo :

Every inch a predatory fish, the pike-perch is an impressive coldwater fish

W. J. Howes

The Pike-Perch for Aquaria

by WILLIAM J. HOWES

THERE are many aquarists who are under the impression that this particular fish is a hybrid. With such a familiar name like pike-perch it is quite obvious that it should be misinterpreted.

Nevertheless, the pike-perch, *Lucioperca*, is an entirely separate species and still practically unknown in England. It is, however, a member of the family Percidae, and is like a perch in many ways. It has the two handsome dorsal fins of the perch, in particular the first which is spiny and is erected when the fish is in danger. The fins on the lower part of the body are of a creamy colour and look quite delicate, yet they are broad and well formed. The mouth is large and heavily toothed, which indicates the fish's predatory nature.

Pike-perch grow larger than the largest perch, but not so large as a big pike. In common with these two popular fishes the pike-perch is a true predator, for it will consume any fish small enough to be swallowed. Moreover, pike-perch are reputed to be extremely voracious and continually preying on small fish, so much so, in fact, that it is reckoned that if they are released in waters which are totally enclosed the population of other fish species will decrease at an alarming rate!

There are, apparently, several varieties of pike-perch. Two of these are *Lucioperca sandra* and *Lucioperca volgensis*. The former is found in the Danube, North Russia, Sweden, Hungary and North Germany, and *L. volgensis* is found in Austria and South Russia, particularly in the Volga. America too, has pike-perch in some waters.

It is some time now since a consignment of these voracious fish was introduced into this country by the late Duke of Bedford, who was well known as a very keen naturalist. As an experiment he released the fish into the lakes at Woburn Abbey, near Bedford, where they soon became established and increased in numbers. Specimens from there were later transferred to Claydon Lake, where a few fairly large specimens have recently been caught.

Aquarists who are fortunate in obtaining a fish or two of suitable size can successfully keep them in an aquarium

which has a length of some 2 to 3 feet. A background of clumps of the taller growing plants, such as *Vallisneria*, with a few well-placed natural rocks, and at the base of these some small bunches of *Fontinalis*, should make the aquarium look a neat and attractive home for its inmates.

Like the perch, *Perca fluviatilis*, and the pike, *Esox lucius*, the pike-perch needs to be kept in aquaria on its own or with others of its own kind, but as they are cannibals the companions should be of the same size.

Ideally, an aquarium should contain just two or three pike-perch, and these will require fresh live food, and I should say, need be fed twice a week on any little fishes such as small minnows, gudgeon, etc. Unfortunately, specimens of pike-perch are at present rather difficult to obtain, but I certainly think that when they are generally available they will become popular amongst those enthusiasts who specialise in coldwater aquaria.

ADAPTATIONS

(continued from page 98)

The third idea incorporates the use of a tub—preferably of the sort which was once used for the Monday's wash, since this will already be watertight and ready for immediate adaptation. Such a tub will have a diameter of about 2 feet and a height of from 15 in. to 18 in. If hardboard or plywood is now shaped and fixed in such a way as to result in a table-top with a circular hole in the centre of a size just short of the tub's diameter at the top, the addition of four equally-spaced legs will complete a novel garden table. The aquatic centrepiece will be of sufficient capacity to support half a dozen small goldfish and a couple of water lilies such as the bright-red *Laydeckeri fulgens* and the little *Pygmae helvola* in contrasting yellow. This above-ground pond-cum-table is particularly suited to the sort of garden which is completely paved or which is situated on a flat roof, as are the gardens of an increasing number of town-flat-dwellers.

IGUANAS

by ROBERT BUSTARD

YOUNG specimens of the common iguana (*Iguana iguana*), most of which are mere babies, are often available in the more enterprising pet shops. Their attractive appearance—they are a vivid green, with a long tail and the suggestion of a crest on the neck and back—interests many collectors. Unfortunately many die owing to lack of knowledge about their requirements.

Iguana babies are now imported into Britain in considerable numbers. They have been collected in Central or Northern South America or the West Indies and shipped to the United States from whence most of the specimens seen in Europe come. When the collector purchases a specimen it may not feed. This is understandable as it has been crowded for some time and is not accustomed to the foods we have to offer it, such as lettuce, banana and tomato. These differ greatly from the leaves and berries it has been accustomed to nibble in its native country. With good care, however, they soon settle down and do well.

In my opinion the best specimens to buy are these between about 18 and 24 inches in length. Such specimens are definitely easier to rear than babies, which may measure about 15 inches, most of which is tail. When purchased they should be brought home to the vivarium and allowed to settle down. Food should be provided and a watch must be kept to see if the specimen starts to feed within the first 2 or 3 days. Newly purchased specimens may not feed when being directly observed but it is easy to see if the food has been sampled or merely ignored.

Iguanas enjoy any vegetable food and I feed my specimens on many fruits and vegetables including boiled carrot, tomato, banana, grapes (halved for babies), lettuce and the soft leaves of cabbage and sprouts. Many specimens if well housed will feed without trouble but about half of those imported do not do so. These, unless carefully treated, refuse food and eventually die. Yet it is quite easy to provide for them. What I do is to hold them on my lap and feed them by hand on lettuce leaves and grapes. The lettuce leaf is gently put into the mouth when it is opened (never force open the mouth) and the iguana will commence to chew. Allowing for exercise between feeding, the day's feed can be given each evening in about half an hour. I hand-feed all newly imported specimens unless they feed of their own accord. I usually find that after several days of such treatment they are nibbling food in the vivarium and, after a fortnight, I can stop feeding them since they are feeding normally. I decrease the amount I hand-feed gradually during the second week. On no account force food into the mouth or down the throat. With patience they will accept food from the hands. If the leaf is pressed gently against the mouth most specimens open it and begin to chew the food.

These active arboreal lizards require a roomy vivarium, which should have branches for climbing and an ample pool. Iguanas like to lie along branches, and a healthy specimen will never spend much time on the ground. In nature, when frightened they jump into the water, where



This specimen of the common iguana is 18 in. long. It shows its dewlap below the jaw partly expanded.

they are excellent swimmers. I suggest that a suitable size for one or a couple of youngsters is a vivarium 36 in. by 20 in. by 20 in., but use a roomier one if possible, to allow for growth. Fully grown specimens measure over 5 feet and in a year or two our specimen may measure about 3 feet. If tamed as a baby it will be a most impressive pet indeed.

I know of several that are household pets, being allowed out of their vivaria to lie in the sun or move at random in the room. Indeed I have had several of my own which became very tame and could be trusted with our cat and dog and even children. Iguanas readily sit on one's arm or shoulder, and although when newly obtained they may lash with the tail when frightened, they soon learn to trust their owner. They naturally dislike being placed on the ground, and probably regard their owner as some kind of "mobile tree" on whom they feel perfectly secure.

The best temperature for iguanas is about 75° F. This can safely fall to 55-60° F at night. Most people think that they feed exclusively on a vegetable diet, but this is not the case. Captive specimens like raw meat twice a week and babies often relish mealworms and earthworms.

There is a small species—which requires similar treatment—the naked-necked iguana (*Iguana delicatissima*), mature at less than 2 feet. People often ask me what they can keep with their iguana. I keep mine with an Australian water dragon (*Physignathus lesorei*), each of which measures about 3 feet. They appear to do very well in the same vivarium, since both require the same conditions.

The Worm Turns

by ALBERT J. KLEE

WHEN dog bites man or when fish grabs worm, these incidents are not usually considered news. Let the situations reverse themselves, however, and they become ammunition for the humorous-events sections of our daily newspapers. A recent experience in the "worm-grabs-fish" category, although interesting, did not appear very humorous, at least to the fish concerned.

Some time ago, a local dealer in tropical fishes received a shipment of zebra danios that appeared to be all females. The body of each fish was very plump, indicative of the female sex in this species. However, the contours of the belly line seemed to be extremely lumpy, as if the fish had swallowed some odd-shaped object such as a child's playing jack (Figure 1). In addition, the danios forever seemed to be hungry. At this point, it was decided to dissect one of the fish.

After being anesthetized, the fish was laid out on paper where it could be examined closely (Figure 2). The lumps were clearly seen in this position. A preliminary incision of the ventral area produced a sudden protuberance of the entrails. At this point, it was confirmed that the fish were infested with some kind of worm. The worm proved to be a roundworm, the total length of which turned out to be much longer than the fish itself (Figure 3). Additional specimens were dissected and all contained roundworms, some reaching 5 inches in length.

Since roundworms are uncommon aquarium-fish parasites, the infestation of several hundred of the zebra danios was surprising. Roundworms infest fishes in a variety of ways but this particular species was found only in the intestines of the fish. No attempt was made to identify the particular species of roundworm involved as this is a matter best left to specialists.

The damage done to fishes by roundworms varies with the size of the worm and its particular life cycle. Some roundworms develop as larvae within the body of the host fish and subsequently form cysts. The cysts may cause trouble internally. Other worms may, as in this case, live as adults within the host. If the worm leaves the fish by boring through tissue and organs, much harm can be done by the wounds so made. Since an intermediate host is usually involved, roundworm infestation is not a prevalent aquarium malady. However, fishes may become infested by eating live foods contaminated with worm larvae or by eating fishes already infested with worms or larvae.

Upon inquiry, it was discovered that the zebra danios in question originated from a Florida hatchery where they were kept in out-door pools. It seems certain that they became infested through their live food supply, either blood or *Tubifex* worms, or one of the numerous small crustaceans that abound in Florida waters. In spite of the large size of the roundworms, the danios continued in apparent good health for over 8 months. During this time they were active, especially during meal times. Since there was no danger of transmitting the worms from one fish to another owing to the absence of the next host in the life cycle of the parasite, the danios were kept in a community

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Figure 1. Rounded but lumpy outlines were shown by the infested zebra fish



Figure 2. In an anaesthetized fish examined out of water the abdominal distension was marked



Figure 3. The roundworm removed from the intestine of this fish was much longer than its host

Monodactylus argenteus

by JOHN S. VINDEN

IN most parts of the world are found fishes that cannot be described, properly, as either freshwater or marine species, for they appear equally at home in either medium. Breeding, however, usually takes place either in the sea or in the rivers. Some species, like the salmon, live to a regular sexual rhythm, but others haunt the mouths of rivers in both tropical and temperate climates, and can tolerate rapid changes in the salinity of the water. Such fortunate species are known as euryhaline fishes, and they appear to have some mechanism that enables them to overcome changes which would kill or disable most species of marine or freshwater fishes.

In our own country we have some such fishes. The grey mullets (*Mugilidae*), although marine, are often found some distance from the sea and it is thought that they may sometimes even spawn in brackish water, and the ubiquitous three-spined stickleback (*Gasterosteus aculeatus*) which most of us regard as a typically freshwater fish is frequently found in brackish estuaries and has even been caught in a shrimp net in the Mersey estuary in very salt water.

Amongst the tropical fishes of the aquarist there are several species of widely differing families which are able to live in the sea and in freshwater. Amongst these may be mentioned the sailfin mollie (*Mollienesia latipinna*), which actually appears to reach a larger size in the sea than in freshwater, species of glass fish (*Ambassis*), *Therapon jarbua*, *Scatophagus* species and *Monodactylus argenteus*.

Most of these fishes are familiar enough to the aquarist, but the average fishkeeper sometimes has difficulty with some of the species. *Ambassis*, for instance, are difficult to keep unless live food (of a suitable size) is abundant. Mollies of all sorts are fussy about water conditions; *Therapon* is not common on the market, and scats are something of a chancey proposition, for although some aquarists manage to keep them for years, rear them to a large size, and even win prizes at shows with them, others find that they are lucky to keep them for more than a few weeks.

Monodactylus appear to be more robust and hardy for, in the writer's experience, the mortality in the home aquarium, during the first few weeks, is low compared with that of scats and other estuarine fishes.

Monodactylus argenteus is a handsome silvery fish with yellowish shoulder markings. Its body shape reminds us of the common angel fish (*Pterophyllum*), although it is far from being a near relative; it is a first cousin to the sea-bats (*Platax*), whose appearance and colouring is even more like that of the freshwater angels.

The genus *Monodactylus* is a small one, for it contains but three species. *M. argenteus* and *M. falciformis* are found from the Red Sea to the East Indies, and the third species *M. sebae* is found only on the coast of West Africa. The only species available through commercial channels at the moment is *M. argenteus*, although the other two species have been imported in small numbers from time to time.

Monodactylus argenteus, formerly known as *Psetrus*, is not a community fish in the sense that large specimens can be kept with such small species as guppies and neons, but it appears to get on well with other fishes of its own size. Although it is a marine and estuarine fish, it thrives in



Photo:

Lawrence E. Perkins

completely fresh water though, naturally, it cannot tolerate a sudden change from one medium to the other. Specimens offered by reputable dealers, however, have been kept in fresh water for some weeks before being offered for sale, and no trouble should be experienced in this respect. If purchasing from an unknown source it is good policy to enquire whether the fish are in water that is entirely fresh.

Their requirements are simple. Like all fishes they appreciate space, clean mature water and a suitable temperature, which, in this case, is around 75°F. Unlike scats they do not appreciate temperatures much higher than this. Feeding is simple. Any live food, including earthworms and good meaty dried food, of suitable grade, is taken by most specimens, and raw white fish or chopped liver may be offered from time to time. Unlike scats they do not appear to eat aquarium plants and although they sometimes quarrel amongst themselves, no damage appears to result from these encounters.

Given plenty of space and food, they grow rapidly and soon reach a size that makes them conspicuous on the show bench. They are long-lived and rapidly become tame, although they do not like unnecessary disturbance or being moved from one tank to another at frequent intervals.

The monodactyl is not a cheap fish in the sense that the commoner barbs and characins are. The reasons for this are twofold. One is that this species is not bred in captivity and consequently all specimens on the market are wild fish that have been caught individually in the tropics. The other reason is that they are fairly solidly built fish, in spite of their appearance, and their oxygen requirements are such that they cannot tolerate overcrowding in small containers during transport. Therefore the air freight per fish is considerably higher than that for slender-bodied lightly-built species which may travel under much more tightly packed conditions.

Considering these points the monodactyl is far from being expensive, and since it is not too common it has the advantage of being something out of the ordinary run.

The breeder of livebearers will find that possession of a medium-sized monodactyl or two provides a quick and convenient way of ridding himself of his runts, thus

(Please turn to page 111)

Breeding the Blue Gourami (*Trichogaster trichopterus*)

by E. WALLWORK

THIS fish, which is of a warm silver-blue colour, has, as its alternative name three-spot gourami implies, three "eye" spots. One is at the base of the tail fin, one in the centre of the body below the dorsal fin and the third is, of course, the eye itself. Less popular than formerly because it often grows too quickly and too large for the average community tank, it is an attractive and easy fish to breed. In fact, if well fed, the blue gourami will often breed in a community tank. With fishes of its own size, it can be very attractive and, though we usually see it 3-4 in. long, it will grow to 5½ in. long in large tanks.

To obtain four of these fish when young and feed them is all that is necessary as you will almost certainly find one pair that way. Food should be either dried or live, suitably varied, and they will grow quickly in almost any tank, even in small quarters and clouded tanks. They are, in fact, most adaptable.

Sex is usually apparent at 2½ in. length, the females being deeper in the body than the males, and the dorsal fin of the male is extended further backwards, almost to the caudal peduncle. Although it is not usually necessary, separation of the sexes at this stage should be carried out for 10 days or so. Live foods are given constantly for this period, whilst the breeding tank is being set up.

Almost any size of tank will accommodate a breeding pair, but with regard to the size of the anticipated batch, the larger it is the better. Water from the community tank, or matured water from a clean pond (if filtered through gauze), is the best, but any clean tank water will be suitable. Matured water such as that from a pond or tank will contain the minute Infusoria to give the fry their first food. Depth should be about 8 in. Plants used can be almost any, rooted or floating and free from snail spawn or snails. Bladderwort, *Riccia* or water lettuce usually are all that is necessary. Water temperature should be 78-82°F. and water pH around 7.2.

Introduction of the breeders to the tank is best done at night and they usually rest in the dark until the next morning, when the male starts quite early to blow an extensive bubble nest in one corner. The nest is fairly shallow but more diffuse than those we usually find with the Siamese fighting fish. The bubbles are very fine, too, finer than usually associated with fighters. The male chases the female round the tank and sometimes may bully her. For that reason it is sometimes a help to have a fair area of rooted plants in which the female can hide, but because of the high incidence of snail spawn I do not use them in my

breeding tanks. Generally I mask the front glass of the tank with a sheet of newspaper to offset the nervousness which often affects fish newly transferred to a strange tank. Towards the end of the second day the breeding pair will have settled their differences; both will be beneath the bubble nest and the female will be playing a small part in its maintenance by this time. This may not be so, but usually occurs within 48 hours.

Breeding then commences in earnest. The female swims along side the male, who soon arches his body over her middle, exerts pressure on her sides and they roll over in their embrace. The minute eggs leaving the female float gently upwards to the surface of the nest together with fine bubbles from the gill plates of the parents. This procedure is repeated over 2 hours or so and then the male invariably becomes aggressive. It is then best to remove the female, the male continuing to blow bubbles up into the nest. As stated before, the eggs float and often drift all over the surface, and the male can frequently be observed blowing bubbles indiscriminately all over the tank. He will not eat the eggs, and may safely be left with them until they hatch after 48 hours, but is less conscientious after that time and may eat the newly hatched fry. Even so, the aquarist will usually have plenty of fry, as the total spawning may be around 500 or even twice this number if the parents are fully mature.

After removal of the male the bubbles disperse and evaporate but the fry continue to float and, as they are very transparent, they may not readily be seen in a large tank. A good place to look for them is at the opposite end to the heater in one corner, as they are carried there by convection currents. They are immediately below the surface of the water at first but after a further 48 hours are scattered around the tank at various levels, moving for short distances though appearing to have imperfect balance, a condition which corrects itself within 24 hours or so.

When the fry are hatched out, feeding with Infusoria should be started, and this is best drip-fed into the tank to avoid extreme variations in temperature. One of my friends uses a rotting clump of lettuce leaves suspended in an old nylon stocking at one end of the tank and this maintains the infusorial output satisfactorily. Proprietary substitutes also give excellent results. Dust-fine dried food on the surface also helps the fry and they really do grow very rapidly. At the end of the week they are taking micro worms, from which they can then be raised on brine shrimps, small *Daphnia*, shredded worm; for those who really cannot provide these foods, I recommend a well-known brand of cat food, omitting to feed with the barley content. These fry will take almost any foods as long as it is of a suitable size for their mouths at the various stages of growth.

Growth of the batch is most surprising to any one who has raised a batch of any of the customary egg-layers; there seems to be very little uniformity of size in the batch. At the end of a month, when they are eating almost anything, some will be ¼ in. long, others one-third of that size. Some losses, for various reasons, are inevitable, but I should vouch for the fact that the aquarist will have as many as he can handle. Three hundred have been raised by me on one occasion and even in the large tank that held them all, there were three bubble nests, two of which held eggs for a time and some of which hatched out.

There is a brownish variety of the blue gourami available (Please turn to page 117)



DO YOU KNOW THE NAMES?

The vowels of trivial names of fishes are given horizontally in the squares. Fill in the consonants from the jumbled list below to complete the names. One of the down columns will give the trivial name of a well-known aquarium fish.

C C C F F G H L N N N N P P R R R
R R R S S S S S T T T T T T T T T Y Y

(Solution on page 117)

G. F. H.

Garden Pond Competition

These photographs were taken this summer during the judging of the home pond competition organised between members of Nottingham and District Aquarists' Society each year. Judging involved a journey of about 80 miles, in and around Nottingham and Derby, and was accomplished one Sunday morning. The pictures were taken by Mr. Arthur Saxton, member of Nottingham and District A.S., who has also supplied the notes on the ponds.



First Prize. This is the fourth year in succession that Mr. G. Rose has taken first prize. Built in a small garden, this pond features a rockery surround that is planted with a large variety of ferns, irises, etc., and overhanging the rear of the pond are typical "woodland" trees and shrubs of the coniferous group. Every bit of space is utilised to best advantage in the small area available. Shubunkins, golden orfe and other fishes are kept in the pond.

Second prize. Set at the end of a lawn, in the far corner of the garden of Mr. M. Welch, this pond contains lilies (mainly *N. escarboucle*) and is planted with marginal specimens including irises and mimulas. Palms and willows form the background. At one end there is a rockery. Fancy goldfish and large orfe inhabit this pond.



Third prize. This photograph shows only part of Mr. H. P. Lymn's long winding pond, which is surrounded by an edging of rocks with aubrietia, lobelia and alpine plants included. Mr. Lymn has three other ponds, which are smaller, used for breeding purposes. In the large pond veiltail goldfish and shubunkins are kept.



Fourth prize. Mr. M. Morley's pond was completely redesigned before last year's competition. It was formerly the shape of a winding stream, and is now an oblong approximately 30 ft. by 20 ft. with rockery grotto, a sand island. The crazy-paving surround is planted and willows and wood shrubs form a background. In parts this pond is 7 feet deep and holds about 13,000 gallons. Morley is a keen angler and stocks his pond with his catches of trout, tench, carp, gudgeon and also with his own. Last year roach spawned in his pond.

Anabas testudineus — by JACK HEMS

THIS fish, commonly known as the walking or climbing perch, is found in India, Burma, Thailand, southern India, the Malay Archipelago and eastward to the Philippines.

The species belongs to the family Anabantidae, and is an air-breather like those other better-known anabantids, the gouramies, the fighting fish and the paradise fish.

According to the geographical region in which the fish is found, the basic colour varies from brassy green to brownish-olive, lightening to silvery green on the underparts. The dorsal fin is brownish; the pectoral fins are orange; the caudal fin is usually tinged with dark red. Young fish often show some dark vertical bars on the body, and a dark

spot on the gill-covers. But these adornments disappear with advancing age. The edges of the gill-covers are smooth as in the anabantids mentioned above, but provided with a number of tiny, close-set spines or prickles.

Sexing the fish is not easy, for there are no external sexual characteristics by which a male may be distinguished from a female. But by carefully studying a number of climbing perch in a tank, it might not be beyond an experienced aquarist to pick a pair. Points to look for would be richer colours, and, possibly, larger and more pointed fins in a male, and plumper sides in a female.

Little is known about the fish's breeding habits, other than that the female scatters eggs that float at the surface.

the water, and that after spawning is over, the parent fish do not make any attempt to eat the eggs or molest the fry.

It is said that at a temperature of 82°F. the eggs hatch out in about 36 hours. The fry remain in an inverted position until they have absorbed the contents of the yolk sac, after which they assume the normal horizontal position. They become free-swimming about 3 days after breaking free from the eggs.

In its natural state, *A. testudineus* often travels overland from one body of water to another in search of more abundant supplies of food. In times of drought the fish will also leave a dwindling muddy pool for a nearby stream or spring-fed lake. Its journeys are usually undertaken after nightfall, when there is less danger of its body becoming dried out by the atmosphere.

The fish rocks its way, as it were, over the ground by spreading its spiny gill-covers so that they form balancing struts or levers, and supplements this gill-mechanism by vigorous movements of the caudal and pectoral fins. The spines on the gills enable the fish to negotiate most small obstacles and irregularities it finds in its path.

Because the fish has been found in trees, it used to be thought that it could scramble up a vertical surface. But close observation has revealed that the ascent of a strictly upright surface is beyond its powers. It is now believed that fish found alive in trees have been carried there by predatory birds, and there left, to be eaten later, or dropped in the trees while the birds were in flight. At the same time, it is not unlikely that *A. testudineus* would experience no difficulty in getting into a tree by threading its way among the aerial roots and twisting stems of parasitic creeping plants growing around the tree's trunk, and so

proceeding by slow stages on to a low, horizontal branch.

Even when kept in the aquarium, the fish likes to leave the water for short excursions "on land." So a piece of well-scrubbed tree bark or rough-surfaced wood should be provided for it to display its talents whenever the mood takes it.

The bark or board should be placed in a sloping position with one end anchored on the compost, and the other end wedged against the glass of the aquarium—above the surface of the water, of course. To allow the fish sufficient headroom, the aquarium should not be filled to the top.

The aquarium should always be kept properly covered, for if the fish fell over the side to the floor its escape might not be noticed until several hours had elapsed, and a prolonged sojourn in a cold, dry atmosphere would soon kill it. But, for a "tropical," *A. testudineus* is a hardy species, and any temperature between 68° and 80°F. will suit it.

It is not peaceable enough for inclusion in the community tank, and even among its own kind it is not mild-mannered. Its appetite is enormous, and it needs a plentiful supply of bulky meaty food such as earthworms, gentles, *Tubifex*, freshwater shrimps and red meat (lean or cooked), to keep it in good condition. It will, however, take dried food, but this should be in the coarse grade such as is given to pond fishes. Fine-particle foods are taken half-heartedly—sometimes completely ignored—so that the fish, given these, and nothing else, soon become very thin and lethargic.

Given proper care and attention, *A. testudineus* will live for several years, and prove to be an attractive pet to keep and show to one's friends. In the wild state, it reaches a length of about 10 inches. In the aquarium, however, it seldom grows longer than 6 inches.

Our Readers Write

From New Zealand

YOU people don't seem to realise just how lucky you are! I have just received the first copy of my new subscription to *The Aquarist*, and I am astonished at the quantity and quality of equipment and fishes available in England. And especially at the cheapness.

Here in New Zealand, the tropical hobby is just about into the luxury class. For example, a standard 30in. by 15in. by 12in. tank costs here £6 13s., just on double the English price, and a common 60-watt heater is 17s. 6d. Imported (English) ones are much costlier and an English thermostat costing well under a pound is here 30s.

I am amazed that dealers can sell neons at six to eight for £1; we pay 15s. each. The cheapest guppies, white clouds and zebbras are always 7s. 6d. a pair and angels are 15s. and over a pair. If you think £1 10s. expensive for a red-tailed shark, imagine paying £6 for a pair! If *Lepto barbatus* at £4 a pair and spot-tailed pencils at £3 a pair are too costly, one can always fill up with various gouramis and tetras and mollies, all costing about 12s. 6d. a pair. And perhaps a *Corydoras aeneus* for 30s.!

In case I give the impression that the outlook is grim, however, perhaps I should add that, as anywhere, we can often get more fishes more cheaply from breeders, but then there is not much selection available unless one is prepared to travel extensively. Imports of fishes and plants (and even magazines) are very restricted and quarantine of well over 6 months is applied rigorously.

Import restrictions (due to the drop in N.Z. overseas earnings) have clamped down on everything (i.e. no more aquarium accessories at any price), and one can get no money orders or postal notes over a value of 5s. for sending to England. If my sister at present in London had not

entered my subscription, I would not even have *The Aquarist*.

Despite the lack of overseas news, however, most clubs are thriving, and many people are now trying more extensive breeding in response to the demand. Next time you feel like complaining about the 'exorbitant' cost of your hobby, reflect on the plight of your impoverished kiwi cousin down under!

A. W. EVERARD
Wellington, New Zealand.

The Worm Turns

(continued from page 101)

aquarium. Since, also, no cure is known for such a condition, no treatments were attempted. After 8 months, the fish started to die off. Among other things, the large size of the worms had blocked the intestines and made food unavailable to the fish.

Other aquarium fishes have been reported to have contained roundworms and, undoubtedly, additional species will be unlucky enough to be included in this list in the future.

Cacti in the Fish House

THE genus *Conophytum* is somewhat similar to the *Lithops* but they are of more varied shapes and flower with more colours. They should be watered all through the winter but never given too much. They also come from varied arid climes in South Africa but some are found where there is quite a rich loam. It will not be until about next April that the *Conophytum* will go to rest, and then watering must cease. A dry white skin forms over the plant at this time of the year and no water is given until this skin splits and the new growth appears underneath.

OUR EXPERTS' ANSWERS TO TROPICAL AQUARIUM QUERIES

Please can you suggest a treatment for one of my paradise fish which has contracted tail rot?

Net the fish and wrap it in a soft cloth rinsed out in tepid water, but leave the tail exposed. Now swab the caudal peduncle and actual tail fin with ordinary paraffin oil. Perform this operation within about 40 seconds, then return the fish to the aquarium. The small amount of oil that comes off the fish will not do the other occupants of the aquarium any harm. If the fin is badly diseased, cut away the rotten portions with a razor blade, apply the oil and return the fish to the water as mentioned above. If the disease shows no signs of progressing, do not repeat the treatment. If the condition seems to worsen, repeat the treatment after the elapse of about a week. The severed portions of the fin will grow again, but the fin may not grow so long as it was before the fish contracted disease.

The scales of my fish are very rough (in patches) and show fluffy patches like fungus. It is not eating very well, and seems rather inclined to mope in the plants. Can you give me any indication of what is the matter with it and give your advice as to treatment?

The symptoms you described in your letter are indicative of an attack by the protozoan parasite known as *Costia*. A salt bath every other day often brings about a cure: two heaped teaspoonfuls of ordinary cooking salt, or evaporated sea salt, are dissolved in every pint of water. But better still, immerse the fish in a quart of water, at the same temperature as the aquarium, and add five drops of formalin (40 per cent. formaldehyde solution) to the water. Add up to ten drops more (each drop at 1 minute intervals to make sure that the fish does not become unduly distressed). The treatment should not be prolonged beyond 10 minutes. If the fish shows evident distress before that time, net it and return it to another tank, or to the original aquarium.

Please will you give me some information about the care and habits of wasp gobies (*Brachygobius*)?

The wasp gobies need a temperature of about 72° to 80° F. They prefer slightly saline water, shallow and with some flat pieces of rockwork to hide under and rest on. The fish need a meaty diet as, for example, chopped earthworms, *Tubifex* worms, tiny pieces of lean red meat, finely chopped heart or washed liver. They will, however, take dried food, if nothing else is available, but the dried food should be a good one, made up with dried insects, powdered meat and the like. The wasp goby, sometimes called the umber-bee fish, may be placed in a community tank, but it has the reputation of being a fin-nipper. It will nip the fins of fishes that dally close to its lurking places, especially fishes that have long drooping fins such as scarf-tail guppies, fighting fish and so forth. It is not a very active species, but can usually be seen somewhere in the aquarium, sitting quietly, as it were, waiting for a tasty morsel of food to come its way.

My compost has become infested with algae, and I have decided to remove it from the aquarium and clean it. I feel, however, that ordinary rinsing in a bucket of cold water will not kill the green growth, and should like to know a way of eradicating the algae from the compost.

Place the compost in a bucket and pour several kettles of boiling water on to it. Stir it well round to distribute the heat. When it has cooled down, wash it well with ordinary tap water, then drain it and spread on newspapers exposed to the fresh air. When the compost has dried out you may return it to the aquarium.

My tank has become infested with brown algae. Please tell me how to get rid of it.

Brown algae is always something of a problem. It often appears in a tank containing cichlids, especially if the tank

is not in a well-lit position. Probably the thick excreta of the cichlids helps to promote its growth. The best thing you can do is to scrape the sides of the aquarium, wash or scrub the rockwork and siphon the brown scum away. A peat subsoil, or straining the water through a peat filter, often helps to inhibit the growth of this algae. So also does plenty of well-rooted plant life, kept healthy by the action of a bright top light.

I am most worried about a tank of mine which has green water. I am not so worried about the green colour, but will the green water harm the fish? They come and go in the water as if in a fog, but when they move close to the glass they look healthy and do not gasp at the surface.

Apart from its unsightly appearance, green water does not usually cause any trouble to fishes. In fact, some fishes grow remarkably well in it. If your aquarium is exposed to a very bright side or top light, try shading the lightest side with tissue paper stuck to the outside of the glass; introduce floating plants such as duckweed or *Salvinia* on the surface, and plant along the back and ends with a double row of *Vallisneria*. Most newly set-up aquaria turn green before they become properly balanced by the fishes and plant life. Old water in an established aquarium seldom turns green unless the plant life is uprooted and the aquarium is exposed to full sun or strong electric light for several hours every day.

I have a 24 in. by 12 in. by 12 in. aquarium containing zebra fish, rosy barbs, bloodfins and Australian rainbow fish. Recently I introduced four white-cloud-mountain minnows, a pearl gourami, tiger barbs, harlequin fish and a fighting fish. Soon after introducing the latter fishes I started having casualties in my tank. The fighting fish died, and so did the harlequins and one or two of the zebra fish. I have been told that the white-cloud-mountain minnows are the cause of the trouble, for, according to my informant, they exude some poison through their skins which kills certain species of fishes, particularly zebra fish. Is this true? I maintain my aquarium at a temperature of between 65° and 80° F.

We have been told, and read, that white-cloud-mountain minnows and zebra fish will not live for long together, but our own experience is that they will. The trouble lies in the fact that the minnows do not flourish in very warm water, whereas the zebra fish just thrive in it. We think the reason why your recent additions to the tank have died is because of the low temperature that your tank often reaches. Gouramies, harlequin fish, zebra fish and fighting fish will soon die if kept at a low temperature, or in an aquarium that fluctuates between 65° and 80° F. over a short period. The other fishes that you have are much hardier, and most of them will live more happily in a temperature ranging between 65° and 74° F. It is unwise, however, to expect any tropical fish to do well in a temperature so low as 65° F., though there are a few exceptions such as bloodfins and black-banded sunfish that will not mind such cool water.

I have a long narrow tank that I am thinking of dividing into compartments to house fighting fish. Is this idea worth trying out?

Yes. One can place a male in each compartment, or males and females in separate compartments, the male on one side, the female on the other. Seeing the female and not being able to make contact with her often brings the male into tip-top condition for spawning; and the female, on her part, often reacts to the male's courtship on the other side of the glass partition by filling up with eggs.

COLDWATER FISH-KEEPING QUERIES answered by A. BOARDER

I am an invalid and am confined to one room. I have some goldfish in a tank but seem to have trouble because I cannot get or breed live food for the fish. Is there anything I can feed to the fish to take the place of live food?

There is a dried cat food on the market which appears to be mainly dehydrated meat. I find this ideal for fish feeding. It can either be crushed or soaked in water for an hour or so before it is fed to the fish. I think that you will find this a very good substitute for live food.

I have a tank 36 in. long with six goldfish and two shubunkins in it. The fish do not seem well and often get fungus. I do not think that I overfeed but the water smells badly. After cleaning out everything and putting in fresh water the fish seem quite all right and swim around well. Where have I gone wrong?

The fact that the water smelt means that it was impure and the fish would, of course, be ill in such conditions. You may not have overfed but you may have been feeding with a food which the fish do not clear up. Some kinds of food are not relished by all fishes. Try another kind and make sure that there is not a lot of fine dust-like particles in the food. If you could feed solely on live foods for a fortnight I think that your tank would soon improve in water condition. The water plants might not be growing well enough or there may not be enough of them to assist in keeping the water clear. It is not generally realised how much work good growing plants are doing in the tank to prevent accumulation of waste products from the fishes.

What chemicals can I use to get rid of the blanket weed in my pond?

I do not like to recommend chemicals for use in any pond which contains fishes. Copper sulphate is sometimes used but copper is fatal to most fishes even in small quantities. Some pondkeepers use potassium permanganate to clear some of this weed away but as it is a plant similar to those which are needed in the pond anything strong enough to kill the blanket weed could kill the other plants. Keep pulling out as much weed as you can and try to encourage the other water plants to grow more vigorously, when they will choke out much of the blanket weed.

I bred a number of goldfish in my pond and I caught some and kept them in a tank. I used some water from a river for them and after a time the fish seemed to ail, refused food and remained motionless at the surface of the water. I wonder if they caught anything from the river water?

It is quite possible that the fish were attacked by parasites, and these could have been introduced with the river water. It sounds to me as if they have been attacked by flukes (*Gyrodactylus*). They should have a bath in Dettol (a quarter teaspoonful to a gallon of water); leave the fish in for 15 minutes. All the fish may have to be treated and they usually soon recover when returned to fresh water. Use tap water for your aquarium in future as it is likely to be much safer.

I have been recommended to use the zebra mussel in my pond to keep the water pure. Is this all right?

In any freshly made concrete pond it is almost certain that any kind of mussel would soon die. Also these molluscs can move about and feed only when there is a quantity of mud or silt at the bottom of the pond, and this is not likely to be present in a new pond. Once the mussels die they pollute the water very quickly and so I do not recommend their introduction.

I have a 3-years-old shubunkin which has developed a growth over one eye. It has taken about 4 months to grow but the fish is quite well in itself. Should the lump be treated in any way?

If the lump has taken so long to develop it is probable that it is a cyst. This may not be of any danger to the fish and is best left alone. Sometimes a kind of tumour grows and this type can burst and then clear up. Such

growths can be cut and cleared but the one on your fish does not seem to come within this class. If you know of an experienced aquarist locally he might advise the best course to adopt after seeing the fish.

My fish recently had an attack of flukes and so I treated them with the Dettol bath. After replacing the fish in fresh water one female moor remained motionless for about 10 minutes and I thought it was dead. I held it in my hand and pushed it back and forwards through the water for some time and then it suddenly started to move. The next day it was swimming and eating quite normally. Is this very unusual?

It is possible to revive a fish with this method. It is similar to artificial respiration with human beings. The water is forced through the mouth of the fish and out of the gills. This action starts life going again. However, it is just possible that the fish would have recovered without the treatment. It is a well-known fact that many fishes, when treated in a Dettol bath, appear to be dead and that after they are returned to fresh water they recover and soon swim about as if nothing had been wrong. It is not possible to say for sure whether your fish would have recovered, but in any case your method is always worth trying in such cases if it seems that the fish has stopped breathing.

Can green tench be bred easily in captivity? If so, how? Are the young easy to rear and about what size need the spawning fish be?

It is possible to breed green tench in a pond and is no more difficult than breeding goldfish. The method to adopt is to have little fine-leaved water plant in the pond and a good-sized bunch of this tied near the shallow part of the pond for the fish to spawn on. Green tench are usually late spawners, often as late as July. They chase and spawn on plants like the goldfish and the eggs are similar and adhesive. The spawners are very vigorous and chasing may take place all day. The bunches of plants with eggs can be removed to a hatching tank; the eggs hatch in 4 days at a temperature of 70° F. Cooler water means a longer period of incubation. The fry can be reared by methods used for goldfish. I have bred with home-bred tench when they were only 2 years old (about 4 inches long). Feed the spawners well on garden worms to get them in good condition. The young tench are very handsome when in a tank as they have a beautiful bluish-green sheen on the body with a distinctive triangular patch of black on the caudal peduncle. They soon become tame and will take small worms from the fingers.

I read in an answer to a query that the scaled type of fantail goldfish is quite hardy but that the shubunkin type is not. I have bought seven 1½ inch shubunkin fantails and would like to know if I can keep them safely in a garden shed throughout the winter without heating?

It will be possible for you to keep the shubunkin fantails in your garden shed during the winter provided that one or two important points are borne in mind. The fish must not be overcrowded or overfed. Care must be taken to see that in very severe weather the water does not freeze and crack the glass of your container. During very severe weather it may be necessary to provide a form of heating, such as an oil lamp, to prevent the water from freezing over too thickly. It has been found that the fins of the shubunkin types are so soft that they are more liable to infection by fungus than the harder fins of the scaled types, although it must not be supposed that these types do not contract the disease as well. Apart from the softness of the finnage there is no other reason why the shubunkin types should not succeed under your conditions. The spores of fungus may be present in the water but as long as everything is kept spotlessly clean and fresh in the tank you should have no trouble.

AQUARIST'S Notebook



by

RAYMOND YATES

HOW the years fly! It certainly does not seem 8 years ago since the first British Aquarists' Festival was held, way back in 1951. And now yet another B.A.F. is over and remains but a memory. Once again Manchester kept up its tradition of providing wonderful weather for the show period and the visitors responded by coming in large numbers, particularly on the Sunday. The attendance was quite good in view of the really summery weather conditions, and aquarists travelled from as far as Scotland, London and the south in addition to the ones who came from the "home" area of a hundred miles radius. The layout of the show was just right, providing a breakaway from the theatrical scenic effects of the last few years without returning to the dreary lines of stark tanks so often seen in less imaginative shows.

The effect of water changes on fishes from distant parts was observed mainly in guppies, some of which were unable to tolerate the change from hard alkaline water to soft water about or just below neutral. This difficulty will be overcome in future years by allowing guppies to be shown in jars, large (and small) enough to retain the water in which they have been brought to the show. Manchester has not suffered much from the water famine which has hit some authorities and there have been no restrictions on the use of water in the city, which is piped from Haweswater and Thirlmere in the Lake District, 80 miles away. Mains water has remained clear and sparkling and aquarists have suffered no discomfort worth mentioning during the drought emergency.

Fishes on show were generally good, and some were really outstanding. Trade stands were numerous and all the dealers reported good and, in some cases, record takings. In a show of this magnitude the visitors are particularly attracted by the prospect of picking up specimens unobtainable locally and some very unusual fishes were obtainable. These included elephant-nosed fish, *Aleste*, pipe fish, freshwater soles, butterfly fish, sail-fins (not mollies) and many others too numerous to mention. Reptiles and birds were also much in evidence, and there was even a hatching of ducklings which had a play-pen to themselves. One feature of the show was the very big increase in coldwater fishes on display, mainly due to the recently formed Northern Goldfish and Pondkeepers Society. A hatching of sticklebacks attracted attention as well as the many coarse fishes on show. This Society also provided the best fish in the show, a beauty now added to the Belle Vue Zoo Aquarium.

Perhaps the best feature of the B.A.F. is the way one meets old friends from all over the country and the facilities which result in the making of new ones. In days gone by I used to be asked many questions at *The Aquarist* stand. Nowadays what most callers want is not so much information as introductions. One hears, of course, the usual stories of hard luck and of lucky turn-ups and sometimes one is able to help in some small way where experience counts, but, by and large, the rank-and-file aquarist is much more knowledgeable than was the case a few years ago. Facilities at the show, as ever, were more than adequate and the only criticism heard was that press publicity was poor and that the event could, perhaps, have been more widely advertised. Be that as it may, it was obvious to all who toured the show that the B.A.F., now entering its ninth year, has become established as the aquarists' event of the year.

The summer of 1959 has been so wonderful that it seems bad form to grumble. Nevertheless, the long hot summer

Rarely does the back of an exhibition display of aquaria merit photography, but the prize-winning orderliness of the prize-winning stand of the Ferranti Aquarists' Club at this year's British Aquarists' Festival was commented upon by all who saw it. The wiring for seven aquaria was neatly disposed and all control points were clearly labelled.



Photo:

The Aquarist

has provided many hobbyists with problems rarely experienced. Pond owners have found that small ponds were over-heated and choked with algae and have also experienced difficulties with evaporation and water restrictions. Some authorities have turned off supplies for periods and the colour of what has come through the taps has, in some cases, not been to the liking of the crystal-clear brigade. Worms have disappeared and maggots have not lasted long in the extreme conditions. Electricity charges will be below normal, which is a good point! *Tubifex* has almost disappeared as it could not survive long-distance travel in the heat. Clubs report a falling off of numbers at meetings as members have preferred to stay out of doors, and even dealers report that the unusual conditions have been against business as a whole. Coldwater enthusiasts have had to wage a continual fight to keep down the temperature of their tanks, and garden-pool surrounds, lacking water, have often ceased to be ornamental. Fishes moved from one area to another have shown signs of obvious distress, a fact I observed several times, although they recovered in time. *Daphnia* hunters have had a thin time and only they know the heartache of arriving at their secret pond only to find it dried up and no hope of *Daphnia*. Still, in spite of these set-backs, no doubt every hobbyist wants summer 1960 to be a repeat performance of 1959.

Apart from my pond activities I have not bothered with any coldwater fishes for about 10 years on any worth-while scale. However, some time ago I rigged up a tank or two and purchased a mixed selection of golden orfe, catfish, tench, golden tench and dogfish. I obtained

some delightful water plants from natural sources and duly set up some "perfect" coldwater aquaria.

They always say that it never rains but it pours where troubles are concerned, and hobbyists usually find this adage to be very true for their own fishkeeping troubles. After a long period of freedom I observed white spot in a tropical tank of first-class fishes and I treated this with some very old mercurochrome I had in stock. After a week I chanced that it had all cleared up (thinking really of the bad effects on my plants and fishes) and changed all the water (about 30 gallons) over a couple of days. Although a week is nothing like long enough in most instances for mercurochrome to clear this pest, I found my hunch correct and I had no more trouble with the tropicals.

Several weeks passed and then I suddenly noticed white spot in the coldwater tanks. These had not been in contact in any way with the tropical tank which had been affected; the only possible connection was some sun-dried gravel which I had used again after boiling and weeks of exposure to the atmosphere. However it came about, there was no doubt I had white spot in the cold tanks. I also discovered a fungus-like slime on the finnage of the orfe and golden tench, and this I treated with the usual sea-salt method. White spot in coldwater tanks is a slow mover, owing to the lower temperature, and one can leave it without attention for much longer than would be wise with tropicals.

After I had cured the slime growths I gave the coldwater fishes the mercurochrome treatment previously used for the tropicals. It is never easy to say how things fare, plants or fishes, when one has to view them in the greenish brown discoloured water produced by this remedy. Undoubtedly the plants did not take kindly to this and I removed them so that they could stand outside in full light, in a bucket of water duly dosed with mercurochrome. The fishes did not seem unduly worried, except for a large catfish which insisted on remaining at the surface and quickly passed away within a day or two. Two of the orfe jumped out and another orfe died for no obvious reason. The ordinary tench were unhappy and one soon gave up the unequal struggle. Feeding went on as usual, no meals being missed nor appetite lost. The dogfish, three in number, were quite the most unperturbed and also least affected by the white spot. In coldwater tanks this disease can linger for many weeks and it is very hard to be sure that it has been completely eliminated. It can be particularly troublesome with orfe. It might be possible to clear this trouble with coldwater fishes by immersing them in a keep net or the like in running water for some days or weeks, but few of us have such facilities available. Changing the water several times daily at home might do the trick. Otherwise chemicals must be used.

Coldwater fishes vary in their reactions: active fishes, like orfe, minnows, etc., are quite unable to put up with quinine treatments whereas the more sluggish fishes (tench, carp, gudgeon, etc.) will stand almost anything. Perch once diseased are best disposed of, as they are most sensitive. Roach and bream are difficult to keep at the best of time disease-free and react unfavourably to chemical cures. Rudd are most hardy and can take considerable "punishment" by medication. Sticklebacks appear tough but are poor stayers.

Mercurochrome is rightly suspect for possible after-effects. It is quite possible to clear up the trouble and then to find, a month or so later, that fish are dying on you suddenly for no obvious reason. This insidious delayed action is a fact with certain varieties, and in particular where the chemical is old. Such an instance occurred to me recently where a highly prized black shark died suddenly without any warning, also two cardinal tetras, after treatment. The only symptom I know is that the fishes affected give slight jerks, hardly noticeable in nervous and active

fishes, or jerk up the head slightly as if pecking at minute foods in the water above their noses. *Pelmatochromis* are very prone to poisoning with mercurochrome treatment.

I waited for the worst part of the winter to see what effect it might have on my polythene pond. Frankly, I did not feel very happy about what ice and frost might do singly or together. However, I took no prior action and left the pond to its fate, and the fishes also. The early part of the winter proved very mild and the only troubles were soot films on the surface. The frequent rain cleared this so I was not often forced to clean the surface by trailing newspaper sheets across it. With the first days of January the winter set in with a vengeance. Usually we have 2 or 3 days of hard frost and then a rapid thaw. This time the frost went on and on for a fortnight, with moderate snowfalls.

I broke the early ice formations at the start but soon found the paper-thin ice was changing to really thick ice, much thicker than is normally encountered in my area. I cleared the snow by brushing and by pouring boiling water, and I also used this boiling-water method to bore holes through the ice. If a steady stream of boiling water is directed on ice it bores a way through very quickly. My pond froze to a depth of 7 inches. This is very thick, but two or three holes were made and, although these kept freezing over, they never froze more than 1 inch deep overnight and were easy to re-open the next day.

Hammering ice with a hammer is considered dangerous for the fishes; they may be stunned by shock. I have often seen this suggested but never known anyone who had lost any fishes this way, although such may have been the case. Personally, I never hesitate to break the ice with a hammer, however thick, and have never experienced any adverse effects on any of my fishes including (at various times) goldfish, tench, rudd, minnows, carp, orfe, bitterling, perch and gudgeon. I have also done this frequently with aquaria frozen 2 inches deep at the surface with no ill-effects.

All this time the polythene looked very dirty and old and shabby where it could be seen above the surface, and I feared that the eventual thaw would see the end of my pond. When, at last, after a fortnight of freeze-up, the thaw came, the effect on the pond was slow. I helped it along with more hot water and breaking up of the ice but the last vestiges of the ice sheet remained for 5 days. The fishes were all in fine fettle and obviously quite unharmed and the pond remained full and apparently undamaged by the ice. The large masses of starwort, all vivid green, were hopelessly frozen up at the surface but seem as bright as ever, and it was because of these plants that I brushed off and swilled off the snow to allow maximum light through the ice. A friend of mine (Mr. Starbuck of Nottingham) has a small pond 8 inches deep which is lined with only a double thickness of ordinary thin polythene and he reports a similar freeze-up with no ill-effects. It may be rash to assume that polythene can withstand the rigours of an English winter but these two experiences seem to indicate that a fortnight's freezing and the formation of really thick ice leave it unimpaired.

My pond is relatively clean and has no overhanging trees and the risk of foul gases forming under the ice and being unable to escape was slight. Breaking a small part of the surface every day (the same part) helped to allow some exchange with the atmosphere. A friend who has a 3-foot concrete pond was not so lucky. This pond is heavily planted and overhung with oak trees and never cleaned. When at last the thaw came and the snow disappeared from the frozen surface of this pond my friend found his fish (golden orfe) all dead at the surface, under the ice. Some goldfish managed to survive. He had not bothered with the pond all the fortnight and now regrets his lack of attention!

Beginner's Guide to Breeding Tropicals

by AQUARIUS

BREEDING tropical fishes is so fascinating that it is a pity that so few succeed in becoming really first-rate breeders. The trouble is usually that the beginner starts wrongly; and how can one prevent this from happening? Most people go into a hobby blindly but with plenty of enthusiasm. After having made the usual blunders they then seek information from books and "experts." Many leave the hobby because they have failed to breed the thousands of fishes which they have been told will bring them in a small fortune! Others, having got into a mess, then take the steps to find out something about the hobby which would have been better for them to have done in the first place.

In this article it will be assumed that the general principles of aquarium-keeping are appreciated, and it is recommended that livebearing fishes be chosen to make a start with, as provided that a few basic principles are observed there is every chance of success with these. Some of the egg-layers can be bred with ease but it is very difficult to succeed with some of the others; raising the young of egg-layers to maturity also presents greater problems. Of the livebearers the most popular will be the guppy (*Lebistes reticulatus*). Others favoured are platys (*Platyopocilus maculatus*); swordtails (*Xiphophorus helleri*); mollies (*Mollietia latipinna*); mosquito fish (*Formosa heterandria*). These are the usual types kept by the novice, and they are able to bring forth their young alive as almost perfectly formed fishes which are capable of fending for themselves and eating most foods small enough for them to get into their mouths.

The main points to observe in breeding these species are to make sure (i) that a true pair is obtained, (ii) that the fish are not too old and (iii) that they are in good condition. Given these conditions there is no reason why they should not bring forth plenty of youngsters. Although some people advise the beginner first to gain experience with coldwater fishes such as goldfish, there is such a great difference between the methods used for the two that little helpful knowledge might be obtained by so doing.

Most beginners will commence with one tank of mixed species and expect to breed a number of healthy fishes there. This is a great mistake, as although it is possible for many young fish to be born in a community tank they are likely to be eaten by the larger fishes. It is essential that another tank is available in which the gravid livebearer female can be placed so that she can have the youngsters in peace. It is a simple task to sex the livebearers, as the male fish has an anal fin which is so adapted as to enable it to fertilise the female fish; whereas the anal fin of the female is fairly broad and rounded, that of the male is thin, rather pointed and often slightly hooked at the tip. This fin can be moved forward by the male to point in a forward direction at will.

Some breeders keep more than one male to each female but there is no need whatever to do this, as one male is quite capable of fertilising all the eggs inside a female; when they are fertilised they are carried by her instead of being laid immediately. As the embryos develop inside the female fish her body becomes more distended and a dark patch may be shown near the vent. This gravid sign is an indication that the fish will soon deliver the young, and this is the time when the experienced aquarist very carefully removes the female to a separate tank or removes the male fish. In the first place the prospective breeders should have plenty of live food, but also a little of the usual dried foods. It will be found that if small chopped garden

worms are given, the fish will soon be in prime condition. All healthy livebearers will have the urge to breed and it is often more difficult to prevent them than to get them to commence!

The breeding tank should have plenty of water plants as a protection for the young and also a good surface covering of a free-floating plant such as *Salvinia*. It is among the roots of such plants that the youngsters like to hide and from which no doubt they are able to obtain some fine forms of animal life as food. The temperature of the water should be between 75° and 80° F, and when young are expected it is a good plan to lower the level of the water. It is not a good idea to have livebearing females delivering their young in tanks which are 15 or even 12 inches deep. Some youngsters have difficulty in swimming if they are born in too great a depth of water.

Although the female may eat some of the youngsters this is less likely to happen if there is plenty of food for her and if there is plenty of cover for the fry. There are breeding traps on the market for use in these circumstances but some of them can be harmful to the female if she is left in too long. That is when the experienced aquarist has an advantage over the novice. He is able to tell more easily when the female is near delivery time, and so only place her in the trap at the latest moment. But with plenty of plant cover in the tank it is possible to save many youngsters without using a trap.

It is wrong to leave a female fish in a community tank to have her young. She should always be removed so that she can have some seclusion, and this will be better for her and for the youngsters. However, some females, especially mollies, are easily upset when being removed unless great care is taken. The best way to catch the female is to use a large glass or similar container tied on to a transparent plastic stick or tube. This can be moved gently in the water to get the fish into a corner and then raised gradually to the surface with the mouth of the container against the glass of the tank. This is better than using a net for catching.

Small particles of dried food can be eaten by livebearers soon after they are born. A packet food can be sifted through a silk stocking to provide fine food which will be readily taken. Some mashed live foods can also be given, such as *Tubifex*, white worm and small earthworms. Little and often should be the method of feeding and as long as the water is not fouled by giving too much the youngsters will grow on without further trouble.

The different methods used for breeding egg-laying species will be described in a later article.

Monodactylus argenteus

(continued from page 102)

improving his strain of fish and benefitting the monodactyl!

In the freshwater home aquarium this fish appears to cease growth at a length of about 4 inches, but in the sea and in large public aquariums such as that at the London Zoological Gardens, specimens of a much larger size can be seen.

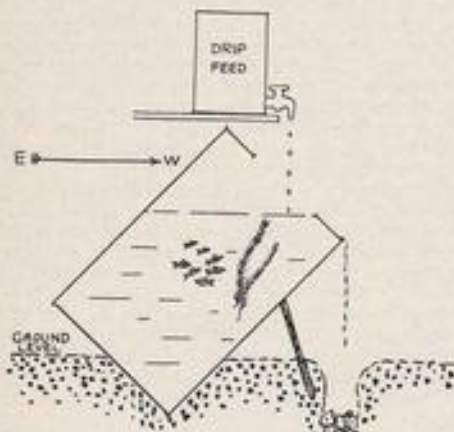
Although not a highly coloured fish it is one that soon endears itself to its owner, and should the latter ever venture into keeping tropical marine fishes he can incorporate his monodactyls into the new scheme of things!

A TILTED DRUM Makes a Good Fish Storage Tank

by THOMAS S. COX

PEOPLE who, like myself, occasionally have fish-storage problems, might find useful an idea I have had in use for the last 2 years. It is a drum of water, tilted to an angle, and kept filled so that the water laps or overflows the lower lip of the drum.

The drum I have in use is a 12 gallons ex-oil drum, but a good sound domestic dustbin will do as well; so will, on a larger scale, a 40 gallons commercial oil drum, opened at one end, and this idea might be useful to persons producing young fish for commercial purposes.



Sectional diagram of the tilted drum partly buried in the ground and supported by a strut (right)

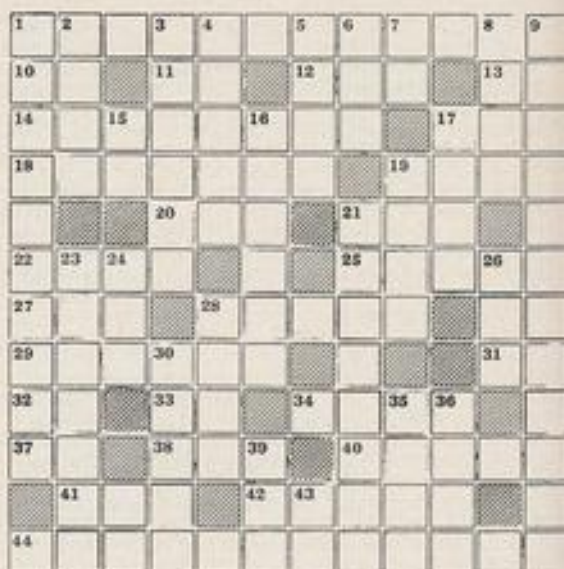
There are numerous benefits obtained by keeping the drum tilted. Firstly, there is a large oval water surface exposed to the air. Secondly, the beneficial weir effect, for carrying away the surface grease, is obtained whenever water is added. Thirdly, the fish seem to appreciate and enjoy, the irregular shape of available water. Lastly, the steeply sloping sides cause the debris to sink down into the remote bottom corner, so that the whole set-up is largely self-scavenging.

Last summer I used the tilted drum idea for rearing mixed coldwater-fish fry from the egg stage, and it proved the most successful of three batches I raised. The drum was mounted by the north side of a fence, to protect it from the midday sun, and it faced west, to let the late afternoon sun on to the water.

During the cold weather, I sank the tilted drum well down into the garden soil, and protected the exposed top from the cold winds with a glass garden cloche, and in this way nursed my breeding shoal of goldfish through the winter, until the time came once more to put my alluring coloured favourites on show in the garden pool again.

The AQUARIST Crossword

Compiled by J. LAUGHLAND



Clues Across

- Not a Jack Dempsey but sounds better (8, 4)
- His decision is final (2)
- No more than an exclamation in deed (2)
- Two letters not in trout (3)
- Henry Short? (2)
- Are rotas changed to freshen the aquarium? (8)
- Whopping fish, not without kidding (3)
- Insect to a T with odd tail for temper (7)
- I leave 40 with a dirty look (4)
- Devour (3)
- Usual aquarist's term for tapereins (3)
- Water carrier sounds as if it is not mine (4)
- One of the shads (5)
- One (aquatic) form of 38 (3)
- This operation follows the Spring flowers (3, 2)
- Fish disease or mushroom? Or jollity, Augustus? (6)
- Head of paradise fish or of the family (2)
- Oddly enough it is not in 12 (2)
- Silent Service (1, 1)
- I'd leave cupids for these (4)
- Not dated (1, 1)
- Roe is this, but not necessarily vice versa (3)
- I stagger back for a gourami (5)
- Even less (3)
- Vehicle in A.A. looks fishy (5)
- Artemia salina* (5, 7)

Clues Down

- Sounds like a flying fish (10)
- Idie gets a notion (4)
- Device for warming tank (6)
- This fish is a treat in a way (5)
- A rule or pattern (4)
- He is half of 29, and better without the jollity (3)
- A short measure (2)
- So he gets confused in cover for 7? (2)
- Branch of hydrodynamics (12)
- Use rot for covers (6)
- I leave the dwarf gourami with a very French exclamation (4)
- Relating to one of the divisions of a shell, or of stricures in the heart and veins (8)
- One who causes an injury (under W.O.) (7)
- Poetical form of 41 (3)
- Young of devil fish? (3)
- Oil from Chinese 'Varnish Tree' (4)
- Colour of one kind of sword-tail (5)
- Persian fairy, ripe but confused (4)
- Mae's back and with a little credit but be a scream (4)
- This may heat your tank or pollute it (3)
- A great honour (1, 1)

(Solution on page 117)

BRITISH AQUARISTS' FESTIVAL 1959



Special cash prize of ten pounds was awarded to the Ferranti Aquarists' Club for the most tidy stand



Formed only this year, the Northern Goldfish and Pondkeepers' Society staged an impressive array of coldwater exhibits

THE Federation of Northern Aquarium Societies are to be congratulated on another fine show staged at Belle Vue, Manchester on 10th and 11th October. The style of the show was similar to that which has been offered for the past 2 or 3 years. Instead of rows of individual entries in undecorated tanks the idea now is to let each competing club put up a stand and the entries of their members are included in the overall display. This means that not only is it easier for the club to show the members' fishes under good conditions but the displays make a much more attractive sight for the visitors. Most of the clubs' displays were very neat and smart and about 18 competing stands were on show.

The prize (ten guineas) for the "tidest stand"

went to the Ferranti Aquarists' Club for their neat display with some very bright tanks. These tanks had been painted a sky blue at the back of the rear glass and this gave a very fine effect when lighted from above. All the wiring etc. on this stand was as neat as possible and a joy to see. Merseyside A.S. staged a larger stand and very effectively displayed the tanks, which were all very smart, at a good level. Another good effort was that of Middleton and District A.S., who had an island site, quite square and extremely neat all round. The flowers growing in hidden pots in the top centre of the stand made a grand show. Several of the other clubs had gone to a great deal of trouble to make their stands attractive and it would have been salutary for societies in other regions of Britain to have

seen them and obtain some ideas on how to make an attractive and unusual fish show.

The tropical fishes did not seem to be quite up to the standard of other years but there were some very good fishes for all that. A very fine black angel fish was greatly admired, it having an all-over sooty black like a mollie. The coldwater fishes were a distinct improvement on any show since 1951, and it was very encouraging to see that the recently formed Northern Goldfish and Pondkeepers' Society was able to make a good display and exhibit some very nice fishes. There were some very good common goldfish, a good lionhead and an oranda with a grand body and finnage. The fantails were fair, but the shubunkins had not the bright colours expected of them. One or two had the shape

Mr. E. Chapman (Sheffield) was one of the judges at the B.A.F.



November, 1959



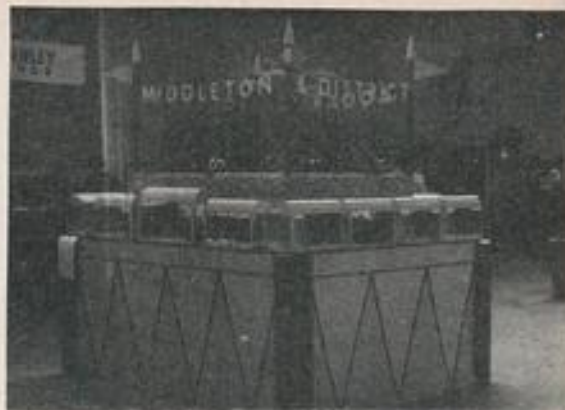
Youngest prize-winner at the B.A.F. was 8 years-old David Coupe, seen here with his entry of sticklebacks which gained a third award

Mr. A. Boarder is seen making notes on a prize-winning tank during judging





Imitation stone walling masked the staging supporting the grouped exhibits of Belle Vue (Manchester) Aquarists' Society



Middleton and District Aquarists' Society had a colourful block of exhibits, with pennants flying at its corners

but all lacked the rich-blue ground colour; some had no red and no blue and so looked very dull. The desired colours are: a rich blue ground colour of body, spangled with patches of red, brown, violet and yellow, with a speckling of black all over the fish.

There were no moans on show on any stand and it is to be hoped that this attractive fish is not being neglected in the north.

Some of the furnished tanks were very good but one of the main faults is still the failure to obtain matching between the base compost and the rocks. Too many or too large rocks are still being used. The winning individual coldwater tank was the best on exhibition, cold or tropical, and was one of the brightest coldwater tanks I have ever seen.

The aquascapes were well thought out and made a great attraction to the many visitors. The one of a South American scene with caves containing blind cave fish was splendidly conceived and carried out.

Most of the hard work of organising was carried out by the hard-working members responsible for previous years' successes, but it is grand to see that they are undaunted by this extra labour and come up for more each year! May these shows continue to give pleasure and instruction to many aquarists and also to serve as an example to the south of how a fish show should be organised and run.

Results

Best fish of the show: oranda (H. Loder), 89 points. **Best society furnished aquarium:** 1, Merseyside A.S., (76 points); 2, Blackpool & Pylde A.S. (75 points); 3, Macclesfield A.S. (73 points). **Best individual furnished aquaria**

(tropical): 1, P. Taylor (Accrington A.S.), 82 points; 2, L. W. Male (North Birmingham A.S.), 77 points; 3, J. Bennett (Middleton A.S.), 74 points. **Best individual furnished aquaria (coldwater):** 1, J. W. Coupe (Northern Goldfish & P.S.), 87 points; 2, L. W. Male (North Birmingham A.S.), 72 points; 3, B. Baxter (Northern Goldfish & P.S.), 71 points. **Best Aquascapes:** 1, M. Knowles (Sheffield A.S.); 2, E. Bunn (Accrington A.S.); 3, W. M. Scaife (Accrington A.S.). **Guppies:** 1, F. Whitlam (Burnley A.S.); 2, Mrs. H. Linton (Middleton A.S.); 3, G. W. Harper (Belle Vue A.S.). **Livebearers:** 1, J. Bottrell (North Birmingham A.S.); 2, W. Lee (Belle Vue A.S.); 3, A. Baron (Rochdale A.S.). **Angels:** 1, A. Moss (Accrington A.S.); 2, L. Groves (Sheffield A.S.); 3, R. Rhodes (Ashon-under-Lyne A.S.). **Dwarf cichlids:** 1, A. Moss (Accrington A.S.); 2, N. Boardman (Belle Vue A.S.). **Cichlids a.o.v.:** 1, R. Walsh (Burnley A.S.); 2, L. Connell (Merseyside A.S.); 3, J. Hodggets (Burnley A.S.). **Fishers:** 1, L. Stone (Ferranti A.C.); 2 and 3, P. V. Tuck (Ferranti A.C.). **Labyrinth:** 1, C. Hutchinson (Belle Vue A.S.); 2, W. T. Kelly (Merseyside A.S.); 3, Dr. D. Porter (Mansfield A.S.). **Barbs:** 1, H. Wainwright (Middleton A.S.); 2, K. Wilbraham (Rochdale A.S.); 3, A. Allison (Merseyside A.S.). **Characins:** 1, A. Wainwright (Middleton A.S.); 2, J. Hodggets (Burnley A.S.); 3, A. Moss (Accrington A.S.). **Carps and minnows:** 1, J. Hodggets (Burnley A.S.); 2, K. Wilbraham (Rochdale A.S.); 3, N. Savage (Middleton A.S.). **Catfish:** 1, Mrs. L. M. Fletcher (Rochdale A.S.); 2, J. Hodggets (Burnley A.S.); 3, Dr. D. Porter (Mansfield A.S.). **Egg-laying tooth-**

carps: 1, J. Beaumont (Sheffield A.S.); 2, L. Wainwright (Middleton A.S.); 3, L. Preston (Burnley A.S.). **A.o.v.:** 1, G. Hadley (Blackpool & Pylde A.S.); 2, A. Moss (Accrington A.S.); 3, J. Hodggets (Burnley A.S.). **Breeders (egg-layers):** 1, N. Boardman; 2 and 3, A. Moss (Accrington A.S.). **Breeders (livebearers):** 1, J. E. Shore (Osram A.S.); 2, W. Lee (Belle Vue A.S.); 3, J. Bennett (Middleton A.S.). **Individual breeders (coldwater):** 1, C. Bennett (Northern Goldfish & P.S.); 2, R. Harworth (Northern Goldfish & P.S.); 3, D. E. Coupe (Northern Goldfish & P.S.). **Plants:** 1, G. Griffiths (Burnley A.S.); 2, L. Preston (Burnley A.S.). **Coldwater fish a.o. (6 classes):** 1, J. W. Coupe (Northern Goldfish & P.S.); 2, L. Baxter (Northern Goldfish & P.S.); 3, T. Roberts (North Birmingham A.S.). 1, B. Baxter (Northern Goldfish & P.S.); 2, L. Baxter (Northern Goldfish & P.S.); 3, R. Howarth (Northern Goldfish & P.S.). 1, T. Roberts (North Birmingham A.S.); 2 and 3, N. Mitchell (Northern Goldfish & P.S.). 1, R. Howarth (Northern Goldfish & P.S.); 2, C. Bennett; 3, J. W. Coupe (Northern Goldfish & P.S.). 1, H. Loder (Silver Challenge Trophy); 2, S. Taylor; 3, H. Loder; 1, H. Penhall (Osram A.S.); 2 and 3, H. Chorlton (Northern Goldfish & P.S.).

The "Roses Shield" presented for inter-Society competition between Lancashire and Yorkshire clubs was won by Lancashire and the special prize for the Society whose members won the greatest number of points went to the Northern Goldfish and Pondkeepers' Society. Special prize for the most Tidy Stand was won by Ferranti Aquarists' Club.

News from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarists' societies for inclusion on this page should reach the Editor by the 12th of the month preceding the month of publication.

THE two recent exhibitions by the Wirral Aquarists' Association were well received by members of the visiting public and the larger show held in conjunction with the Birkenhead Police Flower Show was very well attended.

Due to the Election the clubroom was not available for the usual meeting, so members were invited to the Secretary's house for a Guppy Table Show. The Chairman, Mr. T. B. Johnston, judged the exhibits, awarding

Mr. C. Byrne First and Third, and Mr. J. W. Tomlinson Second. The "Feeding Fish" talks were resumed with a talk by Mr. T. B. Johnston on the uses and mixtures of dried food. Dietary needs of fish were discussed and once again members were given opportunities to voice their own opinions throughout the talk. Maintenance and fry feeding were mentioned, and the speaker concluded by thanking Mr. P. H. Hastings, manufacturer of the well-known "Stimulite" fish foods for technical help given in the preparation of this talk.

DURING the last few months the Pond & Aquarium Society section of Guest Keen & Nettlefolds (Midlands) Limited, has been busily engaged with various activities. A number of Table Shows have been held, the most important being the Annual Show which was held in conjunction with the Horticultural and Cage Bird Sections.

The annual general meeting took place on 1st October, when the Chairman, Mr. T. W. Lowe, and Secretary, Mr. A. Harris were again

re-elected, also a Committee of eight members. The Annual Educational Visit took place on Saturday, 3rd October, when members and their wives visited Regent Park Zoo, London, and at the Club Night on Thursday, 5th November, Mr. R. Marshall of the Walsall Aquarist Society will judge coloured slides in the Home Aquaria and Garden Pool competition, also photographs taken by members at Regent Park Zoo, London.

The Brockley & District Breeders Circle group's one really serious Table Show of the year, the Breeders' Class, was held recently and the first prize was taken by a team of Guppies entered by Mrs. Jan Shield, with 75 per cent. markings. Full results were: 1st, Guppies entered by Mrs. Jan Shield; 2nd, Blue Gouramis entered by Mr. W. Gessey; 3rd, Mollies entered by Mr. R. Thomas. Commended: Red Swordtails entered by Mrs. Jan Shield. The next Table Show will consist of A.V. tropical, excluding winning entries of previous 1959 Shows.

Following upon the winter season's first talk by the secretary on the subject of General Fishing (illustrated by the group's coloured transparencies etc.) the forthcoming programme is as follows: 3rd Nov.—Brains Trust on "Aquatic Plants." 10th Nov.—One-man Table Show. 17th Nov.—Breeding Danios and White Clouds. 24th Nov.—Fish Diseases.

In the coming 1960 season the accent will be on further experiments in 4-family line-breeding and on organised "watches" developed from mammal study techniques. These last will be in continuance of observations made by members in past years. Some members of the group would be interested to hear from aquarists who have made studies of otoliths, particularly British freshwater fish, modern species.

The Open Table Show of the Kingston & District A.S. was held at the Club Headquarters and was considered a great success by all who attended. It is hoped to hold a similar show next year. 262 entries were received for 17 classes and 12 clubs sent in entries. The judging was done by Mr. and Mrs. Meadows and Messrs. Kingston, Fawcett and Cook.

The following are the class winners. Platy: F. Wain (High Wycombe). Swordtail: A. Hart (Clapham). Mollie: H. Ainsworth (Riverside). Barb: J. Horne (Friends). Characin: E. Evans (Clapham). Cichlid: C. Burchell (Horsham). Rasbora etc: W. Ryan (Canford). Tooth Carp: H. Towell (Kingston). Catfish: F. Evans (Canford). Fighter: J. Prince (Willesden). Labyrinth: H. Barlow (Canford). Made Guppy: H. Towell (Kingston). Fancy Goldfish: R. Eason (Willesden). Common Goldfish: W. Walters (Surrey Circle). Shubunkin: W. Walters (Surrey Circle). Breeders (Egglayers): D. Riggs (Riverside). Breeders (Livebearers): H. Ainsworth (Riverside).

The Inter-Club contest held in conjunction with the Show was entered by 12 clubs and the results were as follows: 1st, Canford, 37 points; 2nd, Surrey Circle, 31 points; 3rd, Riverside, 18 points; 4th Kingston, 16 points.

MR. H. J. Vosper, Brockley & District Breeders Circle, 23, Thurley Road, West Norwood, London, S.E.27 would like to offer to visit clubs in the Southern Counties for is normally only available on Friday or Saturday evenings—subjects: Geology for the Aquarist (with specimens etc.). British Marine Aquaria (with specimens and coloured slides). Aspects of Fishkeeping, from Rocks to Genetics (with specimens, slides etc.). Magazines and other club activities (with demonstrations).

AT the Chingford & District Aquarist Society's Annual General Meeting the appointment of officers was made as follows:—President, Mr. E. Bartlett, Chairman, Mr. L. Roberts; Secretary, Mr. H. Sumner, 111, New Road, E.4; Treasurer, Mrs. M. B. Self; Show Secretary, Mr. R. J. F. Self.

It was reported that the Society had quite a successful year during which several new members were enrolled and it was anticipated that the coming year would be even more successful. Full details of other Societies shows would be appreciated as soon as they become available.

MEMBERS of the Canford Aquarist Society recently spent a very pleasant and instructive evening listening to an excellent lecture on livefoods. The lecturer was Mr. E. Arnold who very generously brought along three cultures of white worms complete with food and compost, to be raffled among members, the proceeds of which were donated to the Societies funds.

The Society has competed in quite a number of shows this year and has done exceedingly well.

The meetings are every Monday evening at 7.45 p.m. in the Men's Evening Institute Holbeach Road School, Canford S.E.6 and any local aquarist who would like to come along on Club nights will find a warm welcome.

THE Annual Show of the North Staffs Aquarist Society is to be held on 12th, 13th and 14th November (Thursday, Friday and Saturday) at Charles Street, School Rooms (opposite the Fire Station), Hanley, Stoke-on-Trent and further information can be obtained from the Show Secretary, Mr. B. G. Leadley, 10, Pirehill Lane, Walton, Stone, Staffs.

THE first meeting of the Dundee Aquarium Society season took place recently and was well attended. There were ten entries for the Scott Trophy Table Show for Catfish and the results were as follows: 1, Albert R. Bell, *Corydoras paleatus*; 2, Peter N. Greening, *Corydoras pumilus*; 3, Alex. Cross, *Corydoras aeneus*; 4, Edward J. Seymour, *Corydoras melanostus*.

Six tanks were on display on the stage in conjunction with the Dundee Corporation Parks Dept. display of potted plants, and drew favourable comment from several sources.

INTER-CLUB POSTAL QUIZ

FOR the past twelve months Barrow & District Aquarist Society has been running an Inter-Club Postal Quiz, which has now been won by The Portsmouth Aquarist Society. They are to be presented with a trophy known as the "Gullie Shield" named after a former member of the Barrow Society. Also taking part in this competition were the Lowestoft Aquarist Society.

The next competition will probably start in the New Year, and a few other Clubs have been invited to join, but as addresses of some of the clubs are not known Secretaries of other Clubs who may be interested are invited to write to Mr. K. Ralph, Hon. Secretary, Barrow & District A.S., 8, Malton Crescent, Barrow-in-Furness.

RESULTS of the Accrington Aquarist Society Show are as follows:—Open Furnished Aquaria: 1, Mr. F. Taylor (Burnley); 2, Mr. H. Pickup (Accrington); 3, Mr. G. Hadley (Blackpool). Members Furnished Aquaria: 1, Mr. W. M. Scaife; 2, Mr. F. Hartley; 3, Miss F. Bentham. Members Novices: 1, Mrs. M. Lawrence; 2, Miss B. Stephenson; 3, Mr. R. Smith. Juniors: 1, Miss Sandra Scaife; 2, Master Stewart Hartley; 3, Master Antony Lawrence. Coldwater: 1, Mr. H. Smith; 2, Mrs. V. Stephenson; 3, Mrs. H. Smith. Ornamental Aquaria: 1, Mr. Bunn; 2, Mr. Stephenson; 3, Mr. Lawrence.

AT the September meeting of the Alton A.S. the speakers were John Low, who covered the "Fish of the month" spot by a lecture on the *Colia lala*.

Jan Mitchell gave a lecture on various methods of constructing a garden pond. The result of which two members now have ponds under way. The table show was for Barbs and the results were:—1, John Low, *Barbus conchomus*; 2, Alex Hill, *B. tetrazona*; 3, George Reid, *B. conchomus*.

LOST. It is reported that at the Belle Vue Festival one of the members of **Goole & District A.S.** had a new carrying can and a pair of Black Mollies taken in mistake. If the person who picked up the can will notify this society, arrangements will be made to return it to the owner. Please address to J. N. Banks, 168, Dunhill Road, Goole, Yorks.



The Aquarist's Badge

PRODUCED in response to numerous requests from readers, this attractive silver, red and blue substantial metal emblem for the aquarist can now be obtained at cost price by all readers of *The Aquarist*. The design is pictured here (actual size). Two forms of the badge, one fitting the lapel button-hole and the other having a brooch-type fastening, are available.

To obtain your badge send a postal order for 2s. 6d. together with the **Aquarist's Badge Token cut from page ix**, to Aquarist's Badge, *The Aquarist*, The Butts, Half Acre, Brentford, Middlesex, and please specify which type of fitting you require.

THE North-Eastern Federation of Aquarist Societies held its second Annual Show with great success. There were twelve classes and two hundred and seventeen entries and the standard of fish on show was extremely high. The results were as follows:—Inter-Club Furnished Aquaria: 1, Tyneside; 2, Sunderland; 3, Peterlee. Individual Furnished Aquaria: 1, H. Brown; 2, J. E. Young; 3, R. Weston. Any variety of Characin: 1, J. Bowyer (M.A.S.); 2, L. Thompson (T.A.S.); 3, F. W. Dunn (T.A.S.). Any variety Mollie: 1, W. A. Cowlam (M.A.S.); 2, E. Dawson (S.A.C.); 3, Mr. Johnson (T.A.S.). Any variety Swordtail: 1, R. S. Carver (T.A.S.); 2, L. Thompson (T.A.S.); 3, F. W. Dunn (T.A.S.). Any variety Platy: 1, R. S. Carver (T.A.S.); 2, A. Thomas (S.A.C.); 3, F. W. Dunn (T.A.S.). Any variety Guppy: 1, F. W. Dunn (T.A.S.); 2, F. W. Dunn (T.A.S.); 3, W. Hutton (T.A.S.). Any variety Siamese Fighter: 1, J. E. Young (T.A.S.); 2, F. W. Dunn (T.A.S.); 3, W. Archibald (T.A.S.). Any other variety Labyrinth: 1, A. Duffield (T.A.S.); 2, J. E. Young (T.A.S.); 3, J. Bowyer (M.A.S.). Any variety Cichlid: 1, A. Duffield (T.A.S.); 2, B. A. Hodgson (S.A.C.); 3, P. Tufford (M.A.S.). Any variety Barb: 1, L. Thompson (T.A.S.); 2, J. Hewison (P.A.S.); 3, R. Brown (T.A.S.). Any other variety Tropical Egglayer: 1, B. A. Hodgson (S.A.C.); 2, J. E. Young (T.A.S.); 3, F. W. Dunn (T.A.S.). Any variety Goldfish or Loach: 1, H. Brown (T.A.S.); 2, J. E. Young (T.A.S.); 3, W. Hutton (T.A.S.). Breeders' Class (Tropical): 1, B. A. Hodgson (S.A.C.); 2, A. Duffield (T.A.S.); 3, R. Weston (T.A.S.). Breeders' Class (Coldwater): 1, A. Brunton (S.A.C.); 2, T. Pearson (S.A.C.); 3, A. Brunton (S.A.C.). Coldwater (Single Tail): 1, W. A. Cowlam (M.A.S.); 2, T. Pearson (S.A.C.); 3, T. Pearson (S.A.C.). Coldwater (Twin Tail): 1, A. Brunton (S.A.C.); 2, A. Brunton (S.A.C.); 3, A. Brunton (S.A.C.). Children's Class (any variety of fish): 1, M. Hutton; 2, D. Taylor; 3, G. Pearson.

Winner of T.A.S. Imperial Challenge Cup: Tyneside A.S. Winner of Thompson Points Cup: Tyneside A.S. Winner of Latheron Challenge Cup: Mr. F. W. Dunn, Tyneside A.S. Winner of N.E.P.A.S. Cup: Mr. H. Brown, Tyneside A.S. Winner of Peterlee Cup: Mr. A. Brunton, Sunderland A.S. Winner of N.E.P.A.S. Plaque: Mr. A. Brunton, Sunderland A.S.

THE results of the Leeds and District Aquarist Society annual Show were as follows:—Tropical, Individual Furnished: 1, E. Dobson; 2, D. Hynes; 3, D. Lees. Tropical, Ladies Individual Furnished: 1, Mrs. D. Hynes; 2, Mrs. J. Skinner; 3, Mrs. D. Mowthorpe. Tropical, Inter-Society Furnished: 1, Bradford; 2, Skipton; 3, York. Coldwater, Individual Furnished: 1, Mr. Boothroyd; 2, Mr. Wilson; 3, Mr. Singleton. Tropical, Juniors Individual Furnished: 1, Master Beevers; 2, Master Skinner. Fighters: 1, R. Faircliff; 2, M. Knowles; 3, E. Fowler. A.O.V., Labrynth, Pairs: 1, A. E. Whitlock; 2, A. Parsley; 3, D. I. Cadman. Livebearers Pairs: 1, C. R. Wilson; 2, E. Foster; 3, G. Lamont. Characin Pairs: 1, D. Hynes; 2, J. Orzesko; 3, I. L. Hall. Barbs: 1, H. Cramwick; 2, H. Cramwick; 3, D. I. Cadman. A.O.V., Beaglayers Pairs: 1, J. Holloway; 2, C. Walker; 3, A. Parsley. Breeders Livebearers: 1, D. C. Lees; 2, A. Parsley; 3, B. Norris. Breeders Egglayers: 1, G. Lamont; 2, G. Lamont; 3, D. Lees.

AT a recent special meeting of the **Goole & District A.S.**, the following officials were elected: Chairman, Mr. F. Hill; Vice-chairman, Mr. B. Hunt; Secretary, Mr. H. Mitchell; Hook Road, Goole; Treasurer, Mr. K. Coulthick; F.R.D., Mr. J. N. Banks. It is hoped to provide an interesting programme for the coming year and a hearty welcome is extended to any newcomers.

AFTER a period of six months of suspended activity the **Oxford Aquaria Society** has been reformed, and at the first meeting fifty enthusiasts attended. The first half of the evening was devoted to the setting up of a furnished aquarium for show purposes, and in the second part there was a showing of coloured slides. These slides were made and shown by Mr. S. Frayne, chairman of the High Wycombe Aquarists' Society. The Hon. Secretary is Mr. M. G. Gibbs, 37, Hurst Street, Oxford.

THE quarterly meeting of the **Goldfish Society of Great Britain** will be held on the 5th December at Kingsway Hall, London, W.C.2 at 2.30 p.m.

THE opening meeting of the **Ayrshire A.S.** was held recently with Mr. Cairney, vice-president, in the chair. He welcomed both old and new members and hoped that new fish-keepers would come along and give the club their support. The subject for the evening was the "Guppy". Mr. Whitebolic was the speaker and he brought along various types to illustrate the differences one could have in the same breed of fish. He also said that these fish were used by scientists in their research into heredity.

AT the annual meeting of the **Plymouth Aquarists** it was reported that despite a drop in membership at the beginning of the year the society was on a sounder footing than ever before. Tribute was paid to the competent handling of the accounts by Mrs. W. Rundle.

The election of officers for the ensuing year resulted as follows: Chairman, Mr. W. Stampson; secretary, Mr. M. Summers; treasurer, Mrs. W. Rundle; committee, Messrs. T. Easterbrook, N. Peters, H. Luscombe, J. Southwood, Mrs. J. Southwood, Mrs. W. Stampson. The society is now associated with Plymouth Athenaeum.

MIDLAND ANNUAL OPEN SHOW

THE annual show of the **Midland Aquarium & Pool Society** was held at Birmingham and the results were as follows: Common Goldfish and Comets: 1 and 2, H. G. Jago; 3, T. L. Dodge. Breeders' Class four fish twintails: 1, Mrs. F. R. Close; 2, T. W. Pegg. Breeders' class 6 fish singletails: 1, W. Hicks; 2, Mrs. F. R. Close; 3, T. W. Pegg. Bristol Shubunkins (5 in. body limit): 1 and 2, W. Hicks; 3, T. G. Sutton. Calico Veiltails: 1, E. W. Mason; 2, Mrs. F. R. Close; 3, T. W. Pegg. Bristol Shubunkins (four entries): 1, W. Hicks; 2 and 3, Mrs. F. R. Close. Sealed Veiltails and Sealed Fantails: 1, T. L. Doger; 2 and 3, G. V.



At the Convention held by **Hendon and District Aquatic Society** last month parties from 32 aquarists' societies with other aquarists packed a large auditorium to view an excellent series of projected colour pictures of tropical fishes and to hear the lively and informative commentary on them given by Mr. Bob Calrow. The pictures shown were the work of a photographic group formed within the Hendon Society. During an interval for refreshments, 25 well-known aquarists (some of whom are pictured above), guests of the Society, were ready to meet members of the audience and deal with their questions, and although there were little demand for their services all agreed that the evening was another success to be accredited to Hendon's enterprise.

Keeling. Moors (bred 1959): 1 and 2, T. L. Dodge. Bristol Shubunkins (bred 1959): 1 and 2, Mrs. F. R. Close; 3, T. W. Pegg. Calico Veiltails (bred 1959): 1 and 2, Mrs. F. R. Close; 3, T. W. Pegg. Bristol Shubunkins (matched pairs): 1, T. W. Pegg; 2, W. Hicks. Telescopes (other than Moors): 1, Mrs. F. R. Close; 2, G. V. Keeling; 3, T. L. Dodge. Moors: 1, T. L. Dodge; 2, Mrs. F. R. Close; 3, G. V. Keeling. Bristol Shubunkins (3 in. body limit): 1, Mrs. F. R. Close; 2, S. Lloyd; 3, W. Hicks. Calico Fantails and Calico Nymphs: 1 and 2, T. L. Dodge; 3, G. V. Keeling. Sealed Fantails and Veiltails (bred Keeling): 1, Mrs. F. R. Close. A.V. Pond or River Fish: 1, A. R. Haddon; 2 and 3, W. Richardson. Individual Coldwater Aquariums: 1, E. A. Mason. Inter-Society Aquariums: 1, Midland Aquarium & Pool Society; 2 and 3, North Birmingham. Bristol Shubunkins (Novices): 1, Mrs. F. R. Close; 2 and 3, J. Ashlee. Sealed and Calico Veiltails (Novices): 1, 2 and 3, Mrs. F. R. Close. Barbs—Tinteva, Oligolepis and Cummingi (true pairs): 1, A. T. Smith; 2, J. Bennett; 3, A. Saxton. Barbs—Tetraodon, Nigro, Ticto, Conchonium (true pairs): 1, J. Bennett; 2, A. L. Myatt. Barbs—A.O.V.: 1, J. Bennett; 2, F. Holloway; 3, D. W. Fretwell. Danio, Brach and white cloud mountain minnows: 1, A. T. Smith; 2, A. L. Myatt; 3, T. H. Price. Any Rasbora: 1, T. H. Price; 2, B. Gascoyne. Characins—Hypessobrycon, Hemimigranmus and cardinals: 1, J. Bennett; 2, F. Holloway; 3, T. H. Price. Characins (A.O.V.): 1, J. Bennett; 2, B. Gascoyne; 3, W. Richardson. Fighters: 1, M. E. Beech; 2, T. H. Price; 3, A. E. Allsopp. A.O.V. Male Anabantid: 1, A. E. Allsopp; 2 and 3, T. H. Price. Cichlids (Angels): 1, T. H. Price; 2, W. Richardson; 3, N. C. Pinches. Cichlids (Dwarf): 1, F. Holloway; 2 and 3, G. V. Keeling. Cichlids (Any other): 1, J. Bennett; 2, M. E. Beech; 3, T. H. Price. A.V. Male Guppy: 1 and 2, G. V. Keeling; 3, P. Dendy. A.V. Mollies: 1, T. H. Price; 2, S. Prior; 3, G. V. Keeling. A.V. Platys: 1, C. E. Field; 2, S. Prior; 3, W. Richardson. A.V. Swordtails: 1, W.

Richardson; 2, G. Adams; 3, W. Richardson. A.O.V. Tropical: 1 and 2, G. V. Keeling; 3, T. H. Price. Breeders Class (6 fish—egglayers): 1, L. W. Male; 2, D. W. G. Fretwell; 3, F. Holloway. Breeders (6 fish—livebearers): 1, W. Richardson; 2, G. V. Keeling; 3, S. Prior. Any Catfish: 1, W. Richardson; 2, J. P. Powis; 3, W. Richardson. Any Characin (Novices): 1, P. Dendy; 2, J. A. Crump; 3, J. A. Gillies. Any Danio, etc. (Novices): 1, G. V. Keeling; 2, L. W. Male; 3, J. A. Gillies. Any Barbs (Novices): 1, P. Dendy; 2, Mrs. M. Orton; 3, J. H. Price. Any Livebearers: 1, J. H. Price; 2, P. Dendy; 3, J. P. Powis. Any Male Anabantid: 1, J. H. Price; 2, J. P. Powis; 3, J. H. Price. Traders Class: 1, 2 and 3, Stuart Irskine. Individual Tropical Aquariums: 1, A. E. Allsopp; 2, W. Richardson. Inter-Society Aquariums: 1, Stourbridge; 2, Midland Pool; 3, North Birmingham. Inter-Society Display: 1, Haden Aquarists' Society; 2, Smethwick & District; 3, Walsall Pool.

GOLDFISH SOCIETY OF GREAT BRITAIN

THIS year the Goldfish Society of Great Britain is holding its Annual Convention at the Brotherhood Hall, Hendon on Saturday the 14th November.

The meeting will start at 2.30 and R. J. Affleck, M.Sc., will give a talk on Myths associated with Goldfish-keeping and P. E. Ison, B.Sc., will talk on the latest new varieties of Goldfish available in this country.

There will be an Open Show Class for adult Twintails (Veiltails) for which Miss Daphne Morris is presenting the trophy and which Capt. L. C. Betts M.B.E. will judge. This class is open to all and a hearty welcome to exhibit is extended to Twintail breeders within the Society and Veiltail breeders from outside.

As usual there will be the Auction of fishes. The leading breeders of the Society will be providing the fishes and for those fishkeepers who want to obtain good quality strains this opportunity will be unique in enabling purchases to be made at prices not otherwise possible.

As this will be an occasion for the Coldwater section of the hobby to get together in which their interests will be specially catered for, intending visitors should make a note of the date and place. The Brotherhood Hall is on the main Edgware Road just north of the North Circular road, adjacent to the Schweppes factory. There are good bus services passing the door as well as the Green Line.

For further details please contact the Secretary W. L. Wilson 57, Constable Gardens, Edgware, Middx.

THE results of the North Western London Group of Aquarist Societies coldwater class show were as follows: Common Goldfish: 1, Mr. Gerkin (Wilkesden A.S.); 2, Mr. C. A. Brown (Wilkesden A.S.); 3, Mr. Seal (Arnold A.S.); 4, Mr. H. White (Hendon A.S.). Fancy Goldfish: 1, 2 and 3, Mr. S. Wingrove (Wilkesden A.S.); 4, Mr. G. King (Hendon A.S.). Shubunkins: 1, Mr. S. Wingrove (Wilkesden A.S.); 2, Mr. R. Chapman (Hendon A.S.); 3, Mr. C. A. Brown (Wilkesden A.S.); 4, Mr. G. King (Hendon A.S.). British Native and Foreign Coldwater: 1, Mr. Walker (Wilkesden A.S.); 2 and 3, Mr. R. Porter (Wilkesden A.S.); 4, Miss Stephens (Independent A.S.). The present positions in the points total are: Wilkesden 74 pts., Independent 34 pts., Hendon 25 pts., Hampstead 16 pts., Arnold 11 pts. Mr. R. J. Affleck, President of the Goldfish Society of Great Britain, was judge. Thanks are due to the "57 Club" (H. J. Heinz Ltd.) who staged the classes at their Sports Pavilion owing to Harrow A.C. not being able to hold them.

Although the "57 Club" do not have an aquarist section it was a nice gesture to make possible the show at no cost to the N.W.L.G.A.S.

Crossword Solution

F	I	G	H	T	I	N	G	F	I	S	H
E	D	E	E	O	U	T	H	Y			
A	E	R	A	T	O	R	S	C	O	D	
T	A	N	T	R	U	M	L	E	E	R	
H	E	A	T	V	A	L	O				
E	W	E	R	E	A	L	L	I	S		
R	O	E	T	R	A	L	A	M	T		
F	U	N	G	U	S	V	P	A			
I	N	R	N	C	U	P	S	T			
N	D	E	G	G	L	E	E	R	I		
E	V	E	A	C	A	R	A	C			
B	R	I	N	E	S	H	R	I	M	P	S

DO YOU KNOW THE NAMES? (Solution) From above downwards the trivial names are: fish, inner, tripulus, trichoptera, erythrogaster, yswarasa and affinis. Thus the first vertical column reads *stings*.

G.S.G.B. CONVENTION

Brotherhood Hall, Hendon
Saturday, 14th Nov. 2-30 p.m.

Speakers

R. J. Affleck, M.Sc.

Goldfish Myths

R. E. Ison, B.Sc.

Technical Matters

Capt. L. C. Betts

Selection of fishes for Breeders

A LIMITED NUMBER OF QUALITY FISHES
WILL BE AUCTIONED

Special Feature

Open Competition
for Adult Twintails

Entries to:

W. L. Wilson, 57 Constable Gdns,
Edgware.

Wintering Goldfish Outdoors

by A. BOARDER

A QUESTION often asked is "How big do goldfish have to be to go through the winter safely?" Although it has been written often that a goldfish needs to be 3 inches in length before it can go through the winter in an outdoor pond or container I have proved this to be quite wrong; goldfish will exist all right even if only half an inch long overall. It has been said that the cold will kill young fish but I have found that even very small goldfish can withstand any amount of cold which we get in this country. The cold alone does not kill the fish, as they could be frozen in a lump of ice and still survive. What does kill most fish left out of doors in containers is the fact that the water becomes foul and poisons them.

For several winters I have left out of doors young fantail goldfish which were not more than half an inch overall, and although I have lost one or two the majority have survived, and is probable that those lost could have been weaklings which would have died under any conditions. On many days the tanks were frozen over quite thickly and holes were bored to relieve the pressure. The young fish appeared to be in no danger even when water spurted out of the freshly made hole for some little time.

What of the other frequently repeated warning to have water about two and a half feet deep to be safe for goldfish to winter in? The above-mentioned fish were housed all the winter in old coldwater cisterns. These had been washed over inside with cement and had been filled up to about two-thirds of their depth with rubble and concreted over. The water in these tanks varied from 6½ to 8½ inches only and yet the young fish were not killed by the cold or by the water becoming thickly frozen over. If fantails could stand this treatment then I am certain that ordinary goldfish could do as well.

After many years experimenting I feel certain that when fish die in the winter it is not through the cold alone that they have perished but through foul conditions which have caused the water to become dangerous to the fish. As long

as the water appears clear and has no bad smell it should be quite safe, but sometimes the water may take on a slightly milky hue and this can be very dangerous. This trouble will often follow a long frost, when the ice has been fairly thick and has remained for at least a week. If snow has laid on the ice for some time the danger will have been increased. Should the water look impure at any time during the winter do not be afraid to change a good quantity of it, and do not delay in so doing as it is not necessary to wait long for trouble once the water becomes foul. One day or night can be enough.

Of course, it is almost certain that if the water does become polluted it is through over-feeding. All types of goldfish require very little in the form of food once the weather turns cold and if artificial food is still given then it is almost certain that it will not be eaten and will then turn the water foul. Let nothing encourage you to over-feed in the winter and the fish will be far healthier than if a lot of food is given which cannot be eaten. Even very small fish can go for months in the winter without receiving any artificial food from you. They find enough for their wants, if any, by sucking round the sides and bottom of the tanks.

Breeding the Blue Gourami

(continued from page 103)

from time to time and also a mauve variety in which the spots are less obvious and the general colour is more like mother of pearl. These are only colour variations and they breed true to type as described. These colour variants can also be bred with the usual stock, and, though not often available now, the mauve variety is worth looking for. For some reason or other, it seems less prolific than the usual blue type, which may account for its being in short supply.

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"Hyflo" Junior	£4/12/6
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"Hyflo" Twin Piston	£7/17/6
"Hyflo" Model 'C' Heavy Duty	£12/10/-
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THERMOMETERS	
"Beannon" Mercury Stem	5/6
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	Each	Doz.
Vallisneria Torta	6d.	5/-
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Postage & Packing 1/6 extra.		

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GOOD SIZE AND DISEASE FREE

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Tiger Barb	2/6	Lace Gourami	4/6
Niger Barb	3/6	Blue Gourami	3/6
Cherry Barb	3/6	Thick Lip Gourami	3/6
Tiemo Barb	2/6	Pristella Kiddlei	2/6
Schuberti Barb	3/6	Glass Fish	4/6
Checker Barb	3/6	Australian Rainbows	4/6
Beacons	2/6	Black Banded Sunfish	6/-
Flames	2/6	Bumble Bees	4/-
Black Widows	2/6	Rosaceous Tetras	5/-
Blodfins	3/6	White Cloud Minnows	2/6
Harlequins	2/6	Glowlights	4/-
Penguins	4/-	Red Platies	2/6
Zebrafish	1/6	Swordtails	2/6
Pearl Danio	2/-	Aeneas Catfish	6/6
Scissortails	4/-	Neon Tetras	3/6
Serpae	4/6	Nann. Anomala	4/6
Lemon Tetras	5/-		

RECOMMENDED FISH OF THE MONTH

Black Angels	15/-	Rainbow Javanicus	6/6
Veiltail Angels	15/-	Kissing Gourami	7/6
Lace Angels	7/6	Nann. Nudiceps	12/6
Pearl Chromides	6/6	Upside Down	12/6
Malayan Angels	10/6	Elephant Fish each	50/-
Ceylon Ruby Barbs	6/6	Cardinal Tetras	12/6
Leopard Catfish	8/6	Botia Hymenophysa	12/6
Clown Loach	14/-	Adult Rosaceous Tetras each	6/6
Chilodus Punctatus	14/-	Puffer Fishes	6/6
Ruby Scatophagus	10/6		

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