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Comments and Quotes

- What to do at meetings
- Methods of testing water
- The Aquarium Show 1969

Material for Meetings

At this time of the year the cries from aquarists' societies for speakers, for ideas to make meetings interesting and so on, are loudly heard. One idea that we like very much could very well fill a good many programme gaps for a large number of societies all next winter if embarked upon now. The idea is for as many societies as possible each to undertake the making of one tape recording of about an hour's running time. These recordings could take many forms. Thus the tape need not be a single talk; there could be a variety of items each contributed by different members within any one tape.

Not only would the exchange of the completed tapes between clubs provide a great deal of meeting material but the planning and making of them would form highly valuable sessions demanding full member participation. Every club must have members with something to record that is going to interest another club, say 100 miles away, and even to record (short?) sessions of controversy between members could make entertaining listening. The club's specialists could describe the ways in which they follow their individual interests, other members could contribute a few words on local features (for example: shops, sources of daphnia, nearest public aquarium), say why they think that theirs is the best club there is, discuss pet hates or put up some questions to which answers and opinions are genuinely sought to foster response from the recipients of the tape. If projector slides of relevance to the topics in the tape can also be collected from within the club for loan with the tape so much the better.

If clubs are interested in this idea we will be pleased to announce in February the names of those having tape available for exchange loan. The basic idea is not new, but the concept of encouraging a large-scale preparation of society tapes so that there is a really large amount of material available for the exchanges which we believe to be a constructive and new approach. Why not raise the suggestion at your next club meeting?

Water Testing

Although rather reprimanded by a correspondent whose letter was published in last month's issue of Pet Fish we are unrepentant about our remarks on the subject of technical methods of testing water hardness and reaction. In our Comment (Pet Fish, December, 1968) we wrote that 'to obtain really reliable measurements of either of these facets of water chemistry requires equipment that the fishkeeper is unlikely to have access to or the ability to use'.

Our correspondent gave details of the procedures he has found to be both simple and accurate. But how many of those who would most like to employ these methods can readily obtain and learn to use a burette or even a measuring pipette? The larger problem that also arises with such essentially laboratory procedures is that of proper preparation of standard test solutions and that of main-
taining these, in terms of both storage and handling. We certainly are not denying that the skills and knowledge required can be developed by aquarists, but the acquisition demands more assistance than merely a written description can give, and not many are fortunate enough to belong to a club with fellow-members having the technical knowledge and expertise that our correspondent clearly and so praiseworthy makes available at his own Society’s meetings.

What has been emphasised by letters received is that the original strictures that we published on the unreliability of some water hardness kits and pH kits sold for use by aquarists were fully justified. When authors mention hardness and reaction values in their articles we would like to see included a brief mention of the way in which they were measured. This would give some indication at least of the degree of reliance that could be placed upon them.

Other Papers Please Copy

IN 1965 an Aquarium Show Exploratory Committee formed to investigate the possibility of staging a show for aquarists in London reported that there was a demand for such a show from aquarists’ societies. Unfortunately no-one was prepared to back such a venture or to undertake its organisation until, in the third year of its publication, PETFISH MONTHLY staged last year the first major public aquarium show in London for more than 12 years. But anyone who thought that the call of 1965 had otherwise gone unheeded would be wrong; sponsors have now come forward, a show is to be staged. We do not agree with those who say that it is just another example of PETFISH MONTHLY being a cash cow. We were flattered to have our front cover design so faithfully followed, happy to give the lead on internal features, and we will continue to do so, with pleasure. But it’s mere coincidence, we feel sure, that the announcement of a show follows so hotly on the success of The Aquarium Show. It’s no coincidence, however, that PETFISH MONTHLY is staging The Aquarium Show 1969 in London: same sponsor, same place, 29th October to 2nd November.

LETTERS

Don’t Be Put Off!

IN connection with Mr Johnson’s letter (PFM, February) about the difficulties or otherwise of keeping marine I would say to him—don’t wait for the experts to settle the argument—have a bash yourself without a lot of equipment. Clowns and damselfish are not so very expensive and while no one wants to ‘experiment’ unduly with them, three or four of these fish are not going to ‘break’ anyone. From what I know of freshwater tropical fishkeeping if Mr Johnson waits for the argument to be settled he’ll wait for years. I suspect that the solution is going to be what it’s always been with freshwater tanks. Small set-ups can be maintained easily without much equipment by those who are prepared to mess about a little bit with rubber tubing and buckets of water. Those who do not like doing this, and owners of large, expensive set-ups, will require all the extra aids they can get to maintain trouble-free tanks.

War, Herts. J. BRYANT

A Trader Replies

HAVING read the January issue of PETFISH MONTHLY with my usual interest, I note that Arpee was concerned over the apparent lack of interest shown by the aquatic trader. I would suggest that in the main it is the trader who thinks that ‘he has got it made’ that shows the lack of interest and take-it or leave-it attitude. I am part-owner of this retail shop and can assure you that we are showing real interest both in the general public and society members, as we feel that only in this way can we give the service that customers have a right to expect. One special facility we offer to newcomers to the fishkeeping hobby is that when we sell a tank and accessories we deliver and set up the tank in the customer’s home, thereby showing them the correct way to start in our fascinating hobby: from washing gravel, fixing up the electrical side and advising on the types of plant, rockwork and fish to have in a first community tank. In doing this we find that the customer is happier knowing that the aquarium is safe and the fish and plants have a better chance of flourishing as they should, and we find that these customers return again and again. I would also like to comment on the point about the amateur breeder raised by Arpee. We buy a great deal from local sources and find that the fish we buy are always far superior in size and condition to those we buy through wholesalers. I would point out that we pay top prices for locally bred fishes to ensure that we get fishes of a good size etc. This way we ensure that the breeder is happy with the price he gets, and we are happy, and also the customers, with the quality of the fishes.

Bradford L. TAYLOR Exotic Aquaria Supplies

Small Tanks

HAVING recently purchased a copy of the January issue of PETFISH MONTHLY, I was interested to read the letter headed ‘Small Tanks’ on p. 413. Living in a modern house, I have always imagined that it would not be possible to keep tropical fish unless a space of at least 24 in. by 12 in. by 12 in. was available. As you know, many modern houses just do not have this sort of area when everything else has been fitted in. However, the smaller size quoted by your correspondent does become a viable proposition.

Godalming, Surrey G. C. LAVIS

Continued on page 495
WINDMILL BREEDING TRAP
- Grilled top base and interior partitions allow water flow and movement of fry.
- Fixed base provides exit for fry but not adults.
- Upper compartment dividers enable two adults to be accommodated or can be used to limit movement of a single female.
- Removable secondary base allows passage of water and waste.
- Provision for internal aeration to encourage water flow through trap.
- Legs on which trap can stand on the bottom of a tank, or rubber suckers by which trap can be adhered to side of tank.

HAND REJECTOR
Operated by a gentle pressure on the rubber bulb, forcing all sediment into a filter bag, and then allowing the purified water to flow back into the aquarium.

SPARE BAGS - hand or air: 1 8

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WINDMILL BIOLOGICAL FILTER
18 in. 13.9
24 in. 16.6
The Windmill biological filter consists of a grid of perforated tubes laid down in the gravel of an aquarium. These tubes draw water into the gravel by means of an air-lift, which also helps to aerate the water in the current, thus set up between the stones. Any organic matter in the water is sucked down into the gravel, where the bacteria which live on the surface of each stone feed on the sediment, aided by the ample supply of air dissolved in the water, the bacteria change the sediment into simple salts— which fertilise the plants, and harmless gases which are swept out by the air-lift. Thus the sediment is completely disposed of.

Tank filter requirements:
Two 18-in. filters for a 36-in. tank.
Two 24-in. filters for a 48-in. tank.

AIR REJECTOR
Connect air line to the inlet tube and insert the cleaner into the tank, fish tail down wards, then run the fish tail over the sediment, as you would a vacuum cleaner. The water and sediment will be sucked up the main tube and, falling into the sediment receiver and thence into the filter bag, impurities will be trapped and purified water will pass back into the tank.

17/-

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(See p. 530 BioOrell FLAKE FISH FOOD)

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SEND YOUR ENTRY FORM NOW!!!
THE 2nd NATIONAL FURNISHED AQUARIUM EXHIBITION

will be held at St. George’s Hall, Bradford, on Wednesday, Thursday, Friday, Saturday and Sunday, June 18th, 19th, 20th, 21st and 22nd. Maximum number of entries will be 100.
This competition is open to all keepers of tropical fish, professional and non-professional alike, and there will be a separate section for Marine Aquaria.
The organisers will provide 24" x 12" x 12" aquarium with hood, lights and heater/thermostat.
TAKE PART IN THIS INTERESTING COMPETITION.....
send your entry form TODAY.

FOR YOUR CONVENIENCE.....
★ refreshments will be available during the setting-up period and throughout the duration of the exhibition
★ there is seating, in the hall, for 500 people
★ there is adequate parking space within 50 yards of the exhibition hall, and the main line railway station and the bus station are within easy walking distance.

JUDGES includes: A. G. Jessopp, London; B. Pengilley, Lancashire; G. Reid, Scotland.

RULES AND REGULATIONS
2. Judges’ decision will be final.
3. Entries accepted up to June 1st at 25/-.
4. Late entries accepted up to June 10th at 35/- and no entries will be accepted after June 10th.
5. Any competitor may enter any number of entries and win any number of prizes.
6. No aquarium will be dismantled under any circumstances before 6 p.m. on the final day.
7. All aquarium water will be removed by the management, with the exception of marine water.
8. Any persons employed, relaxed, or in any way connected with the organisers are exempt from entering the competition.
9. While the utmost care will be taken, the organisers cannot be held responsible for loss of, or damage to, any property or livestock deposited in the exhibition hall prior to and throughout the duration of the exhibition.
10. The organisers reserve the right to refuse any exhibition entry.
11. The hall will be open to competitors from 10 a.m. to 8 p.m. on Saturday and Sunday, June 18th and 19th, for the purpose of preparing exhibits.
12. Standard lighting will be provided by the organisers, comprising 2/40W lamps or 3/25W lamps; no alternatives will be permitted.
13. No competitor will be allowed in the Hall whilst judging is taking place.
14. Judging will take place on Monday and Tuesday, June 20th and 21st.
15. Any unforeseen circumstance will be dealt with by the organisers, at their discretion.
16. Each entrant will receive his numbers and final instructions by June 7th.
17. If required, a form will be available authorising the show committee to feed the competitor’s fish during the show.
18. All entry forms must be accompanied by entry fee(s).

ENTRY FORM
To: Keith Barracough, 568, Great Horton Road, Bradford 7, Yorks.
The 2nd National Aquarium Exhibition, Bradford, June 1969.

I, (name) wish to submit (25/- per entry up to June 1st, late entries 35/-), for the National Furnished Aquarium Exhibition, Freshwater/Marine section (delete where not applicable).

Please find enclosed P.O./Cheque to value £. P.O. no. Cheque no. This entry form confirms the acceptance of the rules and regulations laid down above.

Entrant’s signature Date

SPONSORED BY KB. TROPICAL FISH, 568 Great Horton Road, Bradford, 7

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LETTERS

Continued from page 490

Low-voltage Electrics

In the January 1969 issue, D. & J. Brown in their article about 'Aquarium Electrics' made a statement: 'A transformer is used to convert the mains supply, say volts A.C., to, say, 6 or 12 volts D.C. . . .' This is wrong, and readers without electrical knowledge could be misled into making mistakes in their wiring, which could be dangerous. A transformer is used to change (in this instance) 240 volts A.C. to 6 or 12 volts A.C. A transformer will not change A.C. to D.C.; a rectifier is required for this. The simplest method is to insert a single rectifier in the live rail from the transformer output. The rectifier must be capable of withstanding the maximum voltage and current expected, with allowances made for mains surges.

Basildon, Essex

E. J. BYATT

Best Little'un

I found it most enlightening to read Mr C. A. T. Brown's comments on judges' assessment of the best fish in the show (PFM, January). If this award is recognised, as he suggests, simply as 'a means of giving another award' it does seem that some way of allowing for judges' bias towards large size ought to be found. Invariably the awards go to the biggest fish and not to the good little'un.

Bristol

D. CRABBE

Eponymous Varieties

Oh no, Mr Unwin, don't let's seek to be like the rose-growers with the naming of fish varieties after their originators (PFM, January) or other fancy titles. Nurserymen's lists are absolute nightmares in this respect—I would hate to see our fish lists become the same.

Poole, Dorset

L. KING

BOOK Review

COLOUR GUIDE TO TROPICAL FISH by H. Axelrod and W. Vorderwinkler. 160 pages. 171 colour pictures. Oak Tree Press Ltd. 35s.

This is the British edition of a book that was first published in the U.S.A. in 1955. Its arrangement incorporates an interesting idea, that is of helping beginners to identify tropical fishes by colour and colour patterns rather than from family or other group characters. The categories formed by the authors are: Fishes with horizontal stripes; Fishes with vertical stripes; Fishes whose predominant colour is red; Fishes with a basically blue coloration. Fishes whose colour patterns form awkward deviations from this simple scheme are dealt with in a section at the beginning of the book.

It is the colour printing that delights most about this book. Some of the 179 pictures are ones made familiar in other books by these authors. The text is slight in content and fails completely to give guidance on sizes of the fishes and in many instances misleads by default on the suitability of fishes for mixed tanks. In my opinion the book's arrangement of the species by colours is not a successful basis for fish recognition. It is surely straining the system to expect a beginner trying to identify a plecostomus (Hypostomus), for example, to look it up under 'Blues (including silver and black)', and what will be made by use of the book of the small, immature and uncoloured fishes likely to be seen by beginners one cannot imagine. A short glossary of terms and a full index are included in the book, which is attractively printed on heavy coated paper.

THE SEQUEARIUM SYSTEM by Graham F. Cox. 16 pages. Sequearium Ltd. 5s.

Although perhaps rather strong meat in parts for the reader who is brought to a halt by the sight of chemical symbols, THE SEQUEARIUM SYSTEM is nevertheless a booklet that states very clearly and directly the technicalities behind marine aquarium-keeping. An opening section gives in brief paragraphs the general principles of maintenance for a 'marine life-support system'. The main section of the booklet is concerned with water management and control of diseases. Filtration is very fully discussed in this section with a useful analysis of the contrasted advantages and disadvantages of power filters and undergravel filters. Ten suggested systems for marine aquarium maintenance are listed in order of costliness at the end of the booklet, from '(1) undergravel filters covering the whole base of the aquarium' to '(10) undergravel filter plus power filter plus protein skimmer plus u/v steriliser'.

The author says that any one of the systems 'will give complete satisfaction, provided that the reader now has a sympathetic understanding of the somewhat difficult problems underlying successful water management...'

A careful study of Mr Cox's text could certainly provide such an understanding and his booklet must therefore be rated as excellent value for money.

ANTHONY EVANS
Spawning the Dwarf Cichlid Annectens

(Pelmatochromis annectens)

With a sizeable clutch of eggs already in position beneath the slate the female is attaching further eggs and the male is about to turn over underneath them.
When the spawning site has been selected the female fish will make trial spawning movements in the inverted position as shown here. The male is towards the left.

By RUDOLPH ZUKAL

This beautiful fish comes from the large west African area of Liberia. Although it was introduced into Europe as long ago as 1913, it has only recently been bred here freely. Its elongated body, and its large eyes and protruding lips, might well give the impression that it is a predator. But this is not so.

This somewhat shy fish can quite happily be kept in a community of larger fishes. However, amongst themselves *P. annectens* are rather quarrelsome, especially the older specimens, and since they are 'jumpers' the tank must be kept well covered. They do not easily settle down in new surroundings and so they should not be disturbed unnecessarily. Also a major water change can harm them.

If they are kept in a community tank it can be planted quite normally, but like all *Pelmatochromis* species they need to have somewhere where they can hide and, for this purpose, rocks, flower-pots or pieces of slate should be put into the tank. A little sea salt may be added to the normal tap water (1 teaspoonful of salt to 2 gallons of water). The addition of this salt contributes to the fish's well-being. *P. annectens* are not plant-eaters, but they are otherwise very voracious and require a plentiful supply of live foods. These will be hastily snapped up by the older fish, who, quick as lightning, will then dash to the back of the tank again to the safety of their hiding-place. Water temperature for general maintenance should be 72-75°F (22-24°C) and, for the after-spawning period, 78°F (26°C). The fish are not particularly sensitive to a change in temperature if it is of short duration.
Spawning and after-spawning is similar to that of *P. kribensis*. However, the eggs have an elongated oval shape, are white in colour, and they are suspended by the attachment of their narrow ends to the spawning rock. Mostly it is the female that looks after the eggs. The brood hatches in about 3 days and will then be carried by the female in her mouth to a hollow in the gravel, that has been prepared previously, and here they will be cared for until they are free-swimming. The male fish shows no interest during this period.

Sex differences are easy to recognise in the adult fish. The male is the larger and his fins are more elongated. The breeding tube in the female, even at spawning, is not very prominent, but the belly becomes red and the dorsal fins become delicately bordered with colour. A brilliant white spot glows on each side of the vent.
Close-up views of the female (left) and male (right) inverted below the eggs on the slate. The upper edge of the male's tail fin is reddish in hue.

The display of the fish is really beautiful. They swim around each other and touch each other with their jaws, and while this is taking place the female will also be searching for a suitable spawning place. Quite often the female will try out the chosen spot experimentally.

I prepared an 18-gallon tank for the fish and made an artificial cave out of stones and a large piece of slate; as the pictures show, the fish approved of their new home. They spawn, like most Pelmatochromis, belly upwards (exceptions to this are the mouthbreeders and P. thomasi). While the female makes her first attempts at egg-laying, the male waits impatiently nearby. Soon the first eggs are laid and can clearly be seen. After she has laid the first five to ten eggs, the female swims to one side and now it is the male's turn. In the close-up picture we see the female in the process of laying the eggs, with the silver fleck clearly visible. At the first spawning about 200 eggs will be laid. As can be
seen from the photographs, the male has no white spot. But the upper rim of his caudal fin (tail) is reddish. At the time of fertilisation the male presses himself closely to the eggs. When the female has laid the eggs she swims to one side, contracts her tail and quivers her whole body. This is a sign to the male that it is his turn. If the male takes too long, the female becomes impatient, jerks her body and swims at the male.

The fish are very orderly. One cannot criticise their nest—everything is very clean and tidy. After fertilising the eggs the male fish moves away from them, turns himself to his normal swimming position and swims to one side.

The spawning goes on, with this procedure repeated over and over again—the agitation of the fish, the turning over, quivering of the body, laying the eggs, fertilisation, everything is repeated with identical movements.

After spawning, the female guards the eggs like Cerberus. The male swims idly around the tank. The whole process lasts about an hour. It was very interesting to watch the female while she was tending the eggs. She swam very close to them and sucked water in and out of her mouth so that the eggs were moved. She also directed fresh water over them with the movement of her fins. In this way, the eggs were moved, their movement resembling the waving tentacles of an anemone. Very often the female would push the eggs aside with her protruding lips and I was amazed both at the fish’s gentleness and at the strength with which the eggs were anchored to the piece of slate.

The after-spawning period presents no special problems for the aquarist, although it is better for the male to be removed when the spawning is completed.

'I wish you wouldn’t expect an answer every time, dear—that’s the third time I’ve spat ‘em out!
I was thinking back the other day over some of the greater stupidities I have committed since taking up aquariology. Some of the more bearable ones are recounted below as awful warnings to those who may follow suit, though it is said that one has to experience a situation to understand its innermost import. When I first set up the hobby I was in a much less favourable situation than now to obtain live food, and I had the mistaken notion that only by laying in stocks of every patent food on the market would I provide my fishes with an adequate range of nourishment.

This was long before the advent of flake foods, and the results were indescribable. I usually bought the biggest sizes I could find, believing that true economy lay in so doing, and this added to the ultimate smell and provided the largest possible breeding ground for the mites and weevils which quickly took hold. Even in comparatively recent times I have been beguiled by the advertisements and have bought drums of food that have been utterly wasted. It is therefore better in the long run to stick to one sort of food at a time, and to buy the smallest packets or containers compatible with the size of your collection. Fortunately for the town-dweller the range of dried foods (supplemented by frozen ones) is very suitable for most tropical fishes, but dried food should always be fresh. If mites appear in it, throw it away and buy a smaller sized container next time.

A less costly folly, but one that nevertheless, in its non-fulfilment, destroyed all sorts of fond illusions, was my habit of asking dealers for a pair of this or that whenever I saw a new sort of fish I wanted. In the fullness of time it becomes very evident that this sort of request is unreasonable as applied to the majority of egglayers, but the beginner is very tempted to the conclusion that his dealer is less than co-operative if he fails to net out a pair from a teeming tank of rasboras: was there not a photo of a splendid pair in a certain magazine? And so it goes on. It takes time indeed to realise that it is sometimes simple to sex fully grown fish, but that half-grown specimens battle even the breeder. Although I fell victim to the size puzzle much less often, I have often been amazed at the scant care some buyers take over the matter of how large a particular variety will grow. This is especially tragic with the cichlids, whose youngs are simply enchanting, but who become utter monsters most rapidly and present accommodation or dispersal problems or both. These are really important points which should be sold with greater than usual discretion.

The community tank was perhaps one of my biggest blunders. It followed the conventional lines of the thirties—something of everything, from guppies to gouramies. The results were so disappointing that this might have killed my interest for good. Despite pretty rigorous adherence to what all the books said, the fishes didn’t really thrive, but the plants did, and I cannot to this day quite understand why. The unbalance of the tank was the main problem—it was like a shopping centre on a Saturday morning, and no more satisfying. Lumbering great fishes were harried by busy, darting little creatures, and the glorious neons were tucked away behind a rock because the fighter was on the prowl again. Surprisingly, there were some livebearer fry in and out of the Riccia, and we regretted their one-sided battles with the larger fishes. At least this taught me to discriminate more carefully, and to put no disturbing influences in any tank, thereby allowing the fishes to disport themselves naturally, and to display their best colours.

Perhaps the crowning idocy of former days was that of omitting to make provision for the quarantine tank. Many writers have drawn attention to the need for quarantine, but we all scoff at this advice until one really nasty bout of ich has ravaged around for a few weeks, and it is at this stage that the really serious thinking begins. The tropical aquarist who decides that a quarantine tank is not a necessity can be quite certain that, one of these days, he is going to spend a few quite agonising weeks watching his collection either dwindle or deteriorate. If this prospect is attractive, well and good; but in most cases we have considerably more regard for our charges and our pockets, to say nothing of our morale, and in this event the hospital tank comes into being quite naturally and remains as part of the way of things. There will be those who think I am being alarmist about the odd touch of ‘spot’, and it is quite true that the less virulent strains can be rapidly quelled with patent medicines. But it will be just your luck to give shelter to one of the hardier ones, and these are the very devil to dispose of. For the sake of a pound or so you can virtually insure yourself against losses from this cause. I speak from hard experience on this point; the quarantine tank is an absolute necessity to the foolish aquarist—the wise one will have set one up already. My list of ‘clangers’ has grown depressingly long, since I haven’t by any means exhausted the possibilities; perhaps I’ll continue the recital in a future issue.

I recorded recently in these columns a serious loss affecting all the Cryptocoryne plants in one of my tanks into which I had introduced some tree branches for decorative effect. I noted that although the initial sudden die-down had been dramatic there were signs that regrowth had started after I had changed a third of the water and removed the tree wood. I gave the tank the benefit of some 10 hours’ Gro-Lux lighting each day to promote the growth of any plants that felt equal to it, and the result was that Sagittaria and Amazon swords burst into unwonted growth, followed gradually by the emergence of the Cryptocoryne. The present situation is that most of the old crowns seem to have put forth new foliage and it may not be long before the original situation is restored.
Two New Goldfish Standards

New Standards for two old favourites have been drawn up jointly by the F.E.A.S. and the Goldfish Society of Great Britain.

Comet Goldfish

(A) Anterior margin of dorsal fin.
(B) Length of caudal fin.
(C) Length of body.
(D) Length of pelvic fin.
(E) Length of pelvic fin.
(F) Minimum length of body—3 inches.

Standard Fish

(G) Depth of body—half body length (1/2 BL).
(H) Caudal lobe of caudal fin—equal to body length.
(I) Length of anterior margin of dorsal fin—1 body length.
(J) Dorsal margin of caudal fin—elevated to approximately 40 degrees to lateral line.
(K) Length of pelvic fins—1 body length (1 BL).
(L) Fork in caudal—fork to commence at 1/2 body length from caudal peduncle and to have app. 80 degrees angle.

POINTS TABLE

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<td>Colour: Metallic Group</td>
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Condition and Development

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<td>Carriage of caudal</td>
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Personal COMMENT

Recounting the incident to a very experienced aquarist recently I was surprised to hear him attribute the whole trouble to the use of tree wood 'without doubt'. He is of the opinion that unless tree wood has been exposed to the elements, and preferably under water, for no less than a year, it is potentially a killer. Certain substances seem to leach out of the wood over a period and are irremedial to certain other things. The general drift of this makes sound good sense to me so far as there are many plants that are poisons to man and there are many which are not. Equally, it is quite reasonable to accept that certain woods are harmful to aquatic plant life, just as others may be neutral or even beneficial.

This outlook is underlined by the fact that on the selfsame day on which I placed that fatal wood in the tetra tank I placed a good chunk of de-furled wood from the same field, but from a different tree, in my angel tank. Not the slightest trouble has been experienced in the latter case, and I can recall plenty of past occasions on which I seem to have got away with it. The lesson to be taken certainly seems to be that great caution should be exercised before introducing anything of this sort into a tank containing valuable fishes or plants. If you find a piece of wood which is a 'must' for your décor, first soak it really well for several weeks and try it first in a tank containing expendable stock.

I still think there is something extremely odd about this episode in that only the Cryptocoryne were involved; perhaps readers may be able to comment in the light of their own experience, but on the whole I think that this is yet another field in which research has hardly begun, hence an exchange of any available information is likely to be of general interest. I suppose there will be some readers who will chuckle at my discomfiture and claim that it was all my fault for not buying some plastic reigns in the first place. This would be quite true, but the beginner who wants an easy ride might as well get off at the outset. No real hobby is ever that simple, neither is the way to learning.
**Broadtail Moor**

**Type Test**
1. Depth of body—greater than \( \frac{1}{3} \) body length (B.L.).
2. Eyes—projecting from surface of head.
3. Caudal and anal fins divided.
4. Outer margin of caudal fin having no apparent fork.
5. Minimum length of caudal fin—\( \frac{1}{2} \) body length (B.L.).
7. Minimum length of body—\( 2 \) inches.

**POINTS TABLE**

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<td></td>
<td>10</td>
<td>Contour and size of others</td>
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**Bonus Points**

When shown against other goldfish varieties, this variety will receive 12 bonus points.

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**Standard Fish**

1. Depth of body—\( \frac{1}{2} \) body length (B.L.).
2. Eyes—projecting from head to a marked degree.
3. Length of caudal fin—\( \frac{1}{3} \) length of body (B.L.).
4. Anterior margin of dorsal fin—\( \frac{1}{2} \) body length (B.L.).
5. Length of pelvic fins—\( 2 \) body length (B.L.).
6. Outer margin of caudal fin—approximating to a straight line.

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**GUPPY World**

GUPPY breeders are often divided over the need for plants, but even those using plants are often confused by the two types, water sprite and water wisteria. Who can blame them? The plants are very similar, their similarity often making the aquarist think that they are related, but this is not so.

Water sprite belongs to the family Pteridaceae, whereas water wisteria belongs to the Acanthaceae. The latter plant was first grown by Shirley Aquatics Ltd., to whom we owe the popular name, and in 1955 this plant was officially identified for Mr. C. D. Roe by the Royal Botanical Gardens at Kew. For those who don't like official descriptions the easiest way to tell the two plants apart is by the way they propagate.

**By PETER UNWIN**

Water sprite (Ceratopteris thalictroides) will root from the margins of the plant's older leaves and at any point where the leaf is bruised; this plant is often used floating as cover for newly born fry. If planted, it sends out very little root growth and if any foodiness occurs in the compost these roots rot very quickly and send the plant shooting to the water surface. Water sprite is also referred to as Indian fern.

Water wisteria (Symnea triflorum), on the other hand, sends out fine rosettes at the junction of the stem and leaves; in fact the name Symnea means having tiny threads. Plant these rooting portions or break off the branching stems and plant these in the gravel, where they will quickly take root.

Which plant is better? Why not settle the question by using both?

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Ever since the sales of Culasberg lager financed the wonderful research work carried out on guppy genetics by Wing, right up to modern times with the work done...
by our own Dr Alex Comfort at University College, London. I took it for granted that the guppy was used extensively as a laboratory animal. But if recent figures are to be believed I have been under a delusion. The United Federation of Animal Workers Handbook, the text book of the avant-garde laboratory technician, doesn’t even mention the guppy though it does have a well-written chapter on fish. Also, the figures published by the Institute of Laboratory Animal Resources (U.S.A.) show only too clearly that the guppy is just about as popular as a boiled banana sandwich!

In the number of animals used in research work during the past year, frogs head the list, next is the rat, followed by the hamster and lastly the guppy. Then the numbers steadily decrease through salamanders, turtles, otters, various species of birds, rodents, even opossums; but of the guppy, not a mention. The marine mammals number only 32 and for the amount of work involved this is very few.

With everything in the favour of the guppy from ease of keeping to low running costs, I should have thought it was a researcher’s must. As for its adaptability: enough to ask hasn’t it suffered us for the past 30 odd years?

Meeting at the end of last year, delegates of the International Fancy Guppy Association, representing 17 American and Canadian guppy groups, decided to call their big display in ’69 the ‘I.F.G.A. World Wide Show’. One of the main problems met at shows held this past season was the breeding of sex-changed guppies. To simplify the show secretary’s job and help the judges, the following resolution was proposed and passed: ‘A female guppy may be entered in the female classes unless it displays a gonopodium or shows no gravid spot.’

Aquarists are used to discus and angel fish going on a hunger strike but now I am getting reports of the livebearing toothcarps joining them, though I must admit that all my experience I have never personally found this.

The first signs of this condition are often misinterpreted by the hobbyist, and when he sees his guppies taking in food and then spitting it out he often shrugs this off as mere capriciousness, but if this continues the organs of digestion of the fish will slowly turn into a spongy-like mass, as is seen in dissection of a fish suspected of dying from anoxia (as the scientists call the hunger strike).

Salt added to the tank is often suggested as a treatment, but a better one is to dissolve 25 milligrams of pyridoxine hydrochloride in one gallon (Imperial) of water taken from the aquarium containing the fish; after adding the chemical mix the solution thoroughly, add the fish and leave them in it for 24 hours. Stubborn cases might need a second treatment, but one immersion will usually do the trick. Don’t attempt to feed the fish whilst they are under treatment.

To those to whom the name pyridoxine sounds familiar—it is vitamin B6.

What’s New?

Moonglow Lighting

WITH the knowledge that warm summer evenings will once again bring the garden pond into focus in the not too remote future, the news from Elsworth Electronics Ltd. of their Moonglow low-voltage colour ed lighting for the garden is worth considering. In fact, if you fancy night-illuminated snow scenes around your pond their system will allow for that, too! The outfit comprises two packs, one containing a weatherproof transformer and 75 ft. of special cable and the other one the two moulded lamp-housings. These are made from non-corrosive Cycocol, with sealed-beam lamps; up to six can be connected to the run of cable. The accessories include coloured lenses, ground spikes, wall bracket and bolts and wing nuts. A special feature of the installation is that the cable is merely laid across the rear of a lamp housing, pressed on to spiked connectors and then the back cover of the housing is screwed into position, which clamps the cable firmly. If it is required to move the lamps to new positions at any time the method of connecting the lamps allows this to be done easily. The transformer and cable set cost £6 10s 6d and each lamp is £2 13s 6d.

Plastic Bow-front

NEW to the well-known Hyware bow-fronted plastic aquarium range is a ‘super’ model 36 in. long (12 in. wide by 12 in. deep). Like the others in the range this tank has a black base and cover and is fitted with a condensation tray. Price is about £22.
'SWORD PLANTS' IN SOUTH AMERICA

Specimens of Echinodorus species undulata growing in an aquarium. This is one of four sword plants discovered in southern Brazil and believed to be new both to aquarists and to botanists.

New Amazon Sword Species (continued)

By Dr JOACHIM SCHULZE

Translation by F. MARSH

FOUR plants with the proposed names Echinodorus species rubra, E. species undulata, E. species Porta Alegre and E. species opacus discovered in the southern part of Brazil are believed to be new both to aquarists and to botanists.

Echinodorus species undulata has substantially narrower, more ribbon-shaped leaves than E. species rubra, discussed in the previous article of this series. The leaf blade normally reaches 25-35 cm. in length and seldom more, whereas the width of the leaf is hardly more than 3 cm. The provisional name undulata was given because of the light waviness to the edges of the leaves. This waviness is softer, though, than that of E. species rubra, which can amount almost to 'crimping'. A maximum broadening of the leaves towards the top such as is shown by rubra is not clearly marked in E. species undulata, but the broadest part of the leaf is clearly set at the place where the two strong primary veins leave the mid-vein. From this point onwards to the top the leaf clearly is broad, and from the point down to its base the leaf is fairly sharply pointed.

At the base originate two further, relatively weaker, primary veins, which run close to the leaf edge. In this there is a marked resemblance to Echinodorus Martii Micheli, for which the new kind has already been mistaken by the less sharply observant dealers and naturalists. With careful examination, however, the difference in appearance can scarcely be missed. E. Martii, with its leaves up to 10 cm. wide, becomes much bigger and more powerful (although, of course, in comparing small specimens this is not relevant). But E. Martii has a deep waviness of the leaves, which at times almost calls to mind the indentations that are found on oak leaves.

It is also impossible to overlook the darker colour of the leaves and above everything the leaf structure which shows through with E. species undulata. E. Martii is light green to yellow-green; the new species, on the other hand, is dark green and sometimes even blackish green and the dark colours can be picked out in light locations. Here we are touching on the phenomenon of 'light protection'. We find such dark-green to black-green plants in natural locations in S. Brazil and also cultivated in tanks outdoors—that is to say, in greenhouses. In artificially lighted aquaria the plants become a much lighter colour, unfortunately.

The leaf structure that is visible through the leaf gives
the plant, however, a quite distinct charm and contrasts it clearly from other kinds of *Echinodorus*. It is true that we know such a transparent structure already in the cellophane Amazon sword (*E. Berteroii* (Spreng.) Fassett) as well as from *E. nymphaeifolius* (Grisebach) Buchenau, but the leaf texture of our new kind is much thicker and flesher. The leaf tips are rounded in young plants; later they are somewhat bluntly tapered off. The lateral veins of the leaves also stand out fairly clearly although, of course, not so markedly as with *E. species rubra*.

**Species Porto Alegre**

*Echinodorus* species *Porto Alegre* is named after the southernmost town and capital of the most southerly province of Brazil, Rio Grande do Sul. On the grounds of reports, according to which this plant occurs in the environs of the town and from there is collected and despatched, we have combed this area and searched for the agent, so far without result. On the other hand, this plant together with the other kinds is distributed from the known source in Sao Paulo and even accompanies the deliveries of *E. species undulatus* and *species opacus*.

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However, the entire habitat of this variety so extensively corresponds to those of the other new kinds of *Echinodorus* being mentioned here, that we must consider as possible locations the whole of southern Brazil.

*Echinodorus* species *Porto Alegre* is relatively the smallest of the new species. This plant has a long leaf-stalk, in common with *E. species opacus*, a description of which is below. The leaf is narrow and elliptical, pointed at both ends. The leaves are so very wavy and deformed in growth that this typical shape can best be recognised first in a pressed botanical example. The leaves are fleshy and hard, almost inflexible, and the typical solidity of the leaf structure is not matched by any of the known *Echinodorus* kinds. The leaf blade reaches at the most 10 cm. in length and 3 cm. in breadth, although the breadth is often only 2-2.5 cm. The length of the leaf stem was between 12 and 15 cm. in the specimens I have seen. The five primary veins coming from the leaf base stand out strongly from the underside of the leaf veins. The very strong 'wings' to the stalks give the growing plant a thick sturdy appearance (see the photograph). The leaf colour is like that of *E. species undulatus*—dark to black-green; however, here the leaves are in no way transparent.

The plant is low with a broad outline and is sparse at the top so that it may have to be used in the middle of the foreground of the aquarium to show it to its best advantage. It grows much slower in the aquarium than the two

*Continued on page 508*
Echinodorus species undulata and species opacus

Photographs of herbarium dried specimens for comparison of cultivated and wild forms

Echinodorus species undulata: an aquarium-cultivated specimen

Echinodorus species undulata: a specimen collected in southern Brazil

Echinodorus species opacus: an aquarium-cultivated specimen

Echinodorus species opacus: this plant was collected in southern Brazil
kinds mentioned before although it is just as attractive. As yet there is nothing known about the propagation. The plant material on offer, which is still very expensive, always consists of imported plants that have been collected.

**Species opacus**

*Echinodorus* species opacus is the fourth new species now presented to the aquarium world and at the same time it is recommended as a charming underwater plant. Its conspicuous features are the broad, ovate leaves (with which there is a hint at a blending with the first tapering off at the top species-complex). I have not yet been able to see a specimen with a heart-shaped cut out leaf-base. The leaf blade reaches 5 or 6 cm. in breadth and up to 6 cm. in length, and the broadest point lies about one-third of the way above the base of the leaf. Up to seven primary veins come out from the leaf-base and stand out clearly on the dorsal (upper) side as well as the ventral (lower) side. The leaf colour is dark green to black-green in the specimens collected in Nature and very light in cultivated specimens; in contrast with *E. species undulatus* the leaf is never transparent (hence the use of the name opacus). The leaf stalks reach up to 15 cm. and occasionally a little more. Details of the winged bases of the leaf stalks are given in the diagram. The long, creeping rhizome of the plant resembles in many ways those of the other new *Echinodorus* species. I have not yet been able to see the development of a flower bud and have received no information about this from other sources.

In comparing this plant with the *Echinodorus* species already described for the southern hemisphere those with large heart-shaped leaves (species complex I listed in my November, 1968 article in *P.F.M.*) can be eliminated. *E. species opacus* prefers an emergent life and forms much larger leaves out of water. *Echinodorus uruguayensis* Archavaleta, according to the original description, has small elliptical leaves 6–15 cm. long and 4–5 cm. wide, and the description of it conjures up a picture of an emerged plant with flowers. *Echinodorus longicostatus* Archavaleta has heart-shaped notched leaves, and for this plant also emerged leaves and inflorescence are described. *Echinodorus subulatus* (Mart.) Grisebach is certainly distributed far to the south (locations in the area of Montevideo?), but this plant which in large aquaria thrives abundantly produces only elliptical to longish ovate leaves when emerged and very narrow longish leaves on long stalks when submerged (leaf blades are 40 cm. and more in length, 3–4 cm. wide). *Echinodorus ellipticus* (Mart.) Michals for a long time so little considered is reported as coming from many provinces of northern Argentina; however, the descriptions are of a plant having very large elliptical emerged leaves, up to 20 cm. long and 15 cm. broad. These statements conform with some of my own observations of botanical specimens in the Botanical Museum in Berlin-Dahlem.
INSURANCE companies usually ca’ canny but even the toughest of them wouldn’t exactly class the task of collecting live food for one’s fish a ‘risky’ undertaking! Rather, a good ‘policy’.

At the worst, the risk could be that the hobbyist was prosecuted for trespass by some irate landowner, or maybe has the odd skirmish with a bull, but on average it is just a pleasant way of spending a few hours outdoors; the weather and wet feet we take in our stride.

Not so in some parts of the United States. In fact after reading the instructions to would-be collectors in a club journal I feel the gentle art of hunting Daphnia to be anything but gentle.

‘Before entering high grass always throw in a few sticks ahead of you, then stand still. The green garter snake (length 27 in.), will wriggle away from you but not so the coiled up rattler. There are a mere 65 species of this poisonous scatty in the New World! In the water don’t mistake the northern water snake for the venomous cottonmouth (adult length, 3 feet odd).’

‘Back on terra firma, watch where you put your feet; most dangers here come from ground wasps, hornets, porcupines, poison ivy, skunks, ground hogs and illegal traps, to say nothing of getting lost; and in the vastness of America’s “outback” this isn’t so impossible.’

So, my British readers, the next time you sally forth on a collecting trip and the car gets stuck in the mud or the kids upset the can of Daphnia all over your new seat covers, spare a thought for some of our American cousins and remember that we never had it so good! But then, they don’t have to face our weather.

Transatlantic TOPICS

By JIM KELLY

For the many, long-range planning means looking at holiday brochures in January and February, dreaming about July and August. In winter the slackening off of some fish activities gives us a chance to make plans for next season and those plans just might include the purchase of new equipment. If those dreams include the buying of new tanks a few words from an ex-dealer and keen hobbyist in the U.S., Rip Scales, might help.

Rip learned the practical way from the hard school of the U.S. aquatic trade and he shows this in his first statement: ‘Many stainless steel tanks are not! Many of these tanks are of inferior grades, some merely chromium plated. True stainless steel does not rust, the others do, eventually.’

‘How does this help us? On its own it doesn’t as we cannot tell one tank from another (price apart), but, armed with a magnet, we can tell. If the magnet clings to the tank frame the steel obviously contains a great deal of iron and the chances are it will rust easily.’

Perhaps some manufacturer on either side might like to comment on this statement?

Have you noticed how complicated fishkeeping is getting? For instance, take the angel fish. Though the world of art has often depicted the other kind of angel with many guises, piscatorially we have only had to deal in three: Pterophyllum scalare and P. altum.

The post-war era saw the breeding of lace, lace veil and black versions, but because of their propensity towards ragged fins in the adults they soon lost favour; now, if recent claims in the New World are anything to go by, the poor old angel is coming in as many varieties as the famous Heinz: marble, golden, butterball and, the latest, P. dumirilii. Originally called Platypoecilus dumerilii, it hails from British Guiana and the lower Amazon Basin. Its extended mouth and shorter anal fin differ from the eimeheii.

Further details can be found on page F-498 in the looseleaf edition of EXOTIC TROPICAL FISHES by H. Axelrod. The songwriter of old who composed: ‘I’m looking for an angel, though angels are so few...’ couldn’t have been a fishkeeper!

Price increases in the costs of food and equipment are being felt on both sides of the Atlantic—though the American manufacturer is without the excuse of devaluation. The cost of keeping our finny friends is rising all the time but it serves to remind me of some advice I was given by an aquarist when I was over there... The greatest thing you can spend on your hobby is TIME!

Though we share the same language with our friends across the ocean we describe things are often very different; my indoctrination came during the war when at a base with an American Bomber Squadron I was amazed to find that their men wore ‘suspenders’, only later to find out that these were our ‘braces’.

The same sort of variations occur in the common names we give to our fishes. Cichlasoma nigrofaciatum is known to hobbyists here as the convict cichlid, yet I found that U.S. hobbyists referred to the same fish as the Congo cichlid. As it comes from Central South America, which is a long way from the Dark Continent, I searched around for an explanation; it seems that they originally referred to the Jack Dempsey (C. bicellatum) by the name C. nigrofaciatum, and because of its pugnacious nature the trade nicknamed it the King Kong cichlid. This was later abbreviated to Kong, Kongo and finally Congo! Although the fish in question changed later, the name stuck.
Readers' Queries Answered

Large Aquarium

I am considering constructing a large aquarium in the next few months. The dimensions I had in mind are 8 ft. long, 12 in. wide and 15, 15 or 18 in. deep. I know where I can obtain the frame for such an aquarium, but can you tell me the smallest thickness and type of glass to be used and could I economise on thickness of glass by making two 4 ft. tanks? Is there any material cheaper than glass that I could use, as only the front panel need be transparent?

The depth of the proposed tank as well as its length will decide the thickness of glass required. Two 4 ft. tanks each 15 in. deep could be glazed with ½ in. glass (see table of glass sizes in PETISH MONTHLY Diary). Tanks over 4 ft. must be glazed with ¾ in. glass and it is advisable to have additional cross-struts beneath the base glass for extra support. It is possible to use ½ in. chipboard instead of glass panels if this is sealed and painted with clear polyurethane paint. Off-cuts of this material might be cheaper than glass but it is also possible to buy pieces of plate glass inexpensively from demolition contractors (old shop windows are the source of this glass).

Anchor Worms

I lost most of my pond fish last year with anchor worm and was so discouraged that I decided not to restock. However, after a few months' respite I have decided to obtain new stock this year. Will the anchor worms have died off this winter? If not, how can I be certain that my pond is safe?

If all the fish died last summer the anchor worms themselves will have died with them, as they cannot survive without the fish. But the period of time during which the larvae of anchor worms can survive without fish is not known—it is likely to be up to 2 months. These larvae are unlikely to be killed by cold weather, though cold may delay hatching of anchor worm eggs. The larvae usually appear in early summer. To make certain that the pond is clean, all plants should be removed and dipped, one at a time, in a bucket containing water with 5 drops of bleach solution mixed to the gallon. Each dipped plant should then be immediately transferred to a large container of clean water, or, if possible, put in running water for 5 to 10 minutes. For small ponds, treatment with salt is possible—12 oz. of common salt for every gallon in the pond should be dissolved in hot water in a plastic bucket, the solution added to the pond and well stirred. After 3 weeks, the pond may be flushed out with fresh water. If the pond is too big for such treatment it must be kept without fish for several months yet, until at least July.

If fish are present they should be removed for treatment, and kept in a solution of salt (½ oz. per gallon) for 3 weeks, with a change of half the solution each week for fresh salt solution of the same strength.

Electricity Consumption

Can you please tell me how much electricity the following use: heater and thermostat, pump and aerator, 3 ft. strip light and 4 ft. strip light?

Only the roughest guide can be given without knowing a great many more details. However—heater and thermostat: consumption would depend upon the wattage of the heater and the temperature of the room in which the tank is kept. Assuming that it is a 100 watts heater, with an average room temperature of 60°F (15°C), consumption would be approximately 12 units per day. Pump and aerator: this is more difficult to judge, depending as it does upon the make and capacity of the instrument. A small model would be unlikely to use more than ½ unit per day. A 3 ft. fluorescent strip light, on continu-ously, would consume 1 unit per day and a 4 ft. strip 1½ units per day.

Pond Planting

I am finding difficulty in purchasing plant containers of the right dimensions for the shelves of my pool. I could make them of aluminium sheet and drill plenty of holes in them but I wondered if this material would upset the fishes or plant life in the pool.

In theory the use of aluminium sheet for pond baskets should be perfectly safe, but in practice there is a slight element of risk in using any metal because of the differing properties of water in different areas. It would be much safer to use the plastic baskets that are available. (A list of suppliers has been sent to this correspondent.)

Red-eyed characins

My dealer has some red-eyed characins in stock. Are these suitable for a community tank?

These fish are a peaceful species, though they are quite active and grow to some 2 in. in length. Both the male and female carry a large black marking on the dorsal fin, and with their iridescent colouring and red-brown eyes they make a very attractive addition to the tank. Because they are active swimmers, they do best in a roomy tank; they prefer slightly acid water (filtering the water through peat is a means of achieving this). They will accept dried foods, but should receive a regular amount of live foods such as mosquito larvae and water fleas.

Feeding Plecostomus

How can I provide the vegetable matter that books say is necessary for my Plecostomus cats? They keep eating the leaves placed in the aquarium. It is not, however, enough to drop the leaves into the water, for little notice is taken of floating leaves. The leaves should be weighted with small strips of lead so that they sink to the bottom where the Plecostomus enjoy feeding on them.
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THE AQUARIUM CATFISHES—9

North American Catfishes (FAMILY Ictaluridae)

Possibly one of the last places to come to mind as a potential source of excellent aquarium catfishes for specialized purposes is North America. Although only one family—the Ictaluridae, and it is not a large one, is represented in the fresh waters, the family encompasses giants such as the blue catfish, *Ictalurus furcatus*, strange little 3-inch pygmies known as ‘madtom’ and even eyeless dwellers of the subterranean depths in the heart of the network of limestone caverns of the Edwards Plateau region of Texas.

Certainly the most numerous, even to the point of being considered ‘pests’ and ‘trash fish’ in some areas of the United States, are the bullhead catfishes. They are also probably the best choices for aquarium duties, although they are not completely without fault. As scavengers among aggressive fishes such as cichlids and sunfishes, they are in my opinion almost unbeatable, for not only are they relentless in their ceaseless search for some scrap that might have been overlooked, the tenacity of life with which these creatures are endowed is quite remarkable, and they usually remain undaunted in the presence of even the most persistent fishes of other than their own kind.

Bullheads are distinguished from blue and channel catfish by the rather squared caudal or tail fin and usually more robust bodies. They are excellent parents, and in the spring pairs are often to be seen proudly parading a large and remarkably compact ‘ball’ of tiny bullheads near the bank of the creek or pond in which they live. This is the season for collecting, for at this time the little fish can often simply be dipped up in a tin can or even pan as they swim near. At this age, almost all species are coal black with white bellies, and they are quite hand-some. At a size of one inch or so, they are also quite irresistible.

In the aquarium where the water remains clear, the black bullhead, *Ictalurus melas*, generally remains black with a white belly. In this species all the barbels (whiskers) are black also.

The yellow bullhead, *Ictalurus natalis*, is very similar, but the mandibular barbels are white and as the fish grows the body coloration usually changes from black to a somewhat dirty yellow or bronze.

By BRAZ WALKER
Photographs by the author

The brown or marbled bullhead, *Ictalurus nebulosus*, is a mottled yellow (*nebulosus*—cloudy) as it reaches more than an inch.

Although the bullheads reach lengths of perhaps 18 inches in Nature this is very unlikely in the aquarium; 5 or 6 inches could probably be considered an aquarium ‘maximum’ under most conditions, but fish of this size can consume a surprising amount of food. Hiding places should be provided because there is usually a bully among these cats, who will rather unmercifully besiege others of his kind if there is opportunity. With shelter available, it will be skilfully used.

The ictalurid catfishes, especially the bullheads, are quite remarkable in many ways. Largely responsible for
Channel catfish (Ictiobus punctatus) from North America. It is perhaps the most handsome of this group of 'cats', not generally regarded as attractive fishes.

The almost supernatural ability of these fishes to seek out every available scrap of nourishment is the fact that besides the 'ordinary' sensory enhancement with which most catfishes are provided in the barbels, bullheads have in addition a network of taste buds distributed over the entire body. An individual has been estimated to have 100,000 of these sensory units distributed from one end to the other, and there is also a network of nerve ends over the barbels and head area which are extremely sensitive to touch.

These fishes are also extraordinarily sensitive to vibrations in the audio range of 16 to 13,000 cycles per second, which allows them to 'hear', smell, taste and feel not only food prospects with extreme sensitivity, but predators as well.

On the other hand, they are unusually insensitive to high concentrations of dissolved carbon dioxide in the water. They are often the last survivors in a stagnant pond that is being desiccated by drought, and if the water finally disappears completely the bullheads as a last resort will dive into the soft mud of the bottom. There are records of bullheads being actually 'ploughed up' alive and kicking from fields that had become temporarily flooded and which had subsequently dried up, leaving the fishes that had entered during the high water period stranded.

The three most streamlined members of the family are the channel catfish, Ictiobus punctatus, the blue catfish, Ictalurus furcatus, and the white catfish, Ictalurus catus. The only one of these of primary interest to the amateur aquarist is the channel catfish, which not only happens to be the most handsome but also the most available. This species is bred extensively by State and Federal game departments in the U.S. since it is among the finest food and game fishes of North America. As a result of this extensive breeding programme there has even become available an albino strain of channel catfish, and this version is being distributed by at least one large Florida tropical fish farm. The streamlined body, blush iridescence and black spotting of young channel catfish, combined with the black-bordered, forked tail makes the ordinary version of this fish quite handsome as well as the pink, red-eyed albino.

The blue catfish is very similar and can be distin-

guished only through a count of the anal fin rays. The blue cat has been reported to reach 150 pounds, but the channel catfish, which is the species available for aquarists, will ordinarily maintain a reasonable size proportionate to the size of the aquarium. These fish are very swift and agile, and their aquarium should be covered.

There are several little 3 to 5 inch species of Noturus (Schilbeidae) known as 'madtoms'. Some possess the oddity of having the little adipose or 'fat fin' confluent with or partially connected to the squared tail or even going so far as to have the anal fin prolonged also, giving the impression of a bewhiskered, abbreviated eel. In spite of their lack of bulk, this is compensated for by the armament system, which is made up of very sharp, toothed pectoral fin spines loaded with a paralysing venom. The venom is injected, hypodermic-style, into a victim, and while the amount is too small to be dangerous ordinarily, it certainly discourages excessive handling.

If not for the shyness of the madtoms, certainly they would be the best aquarium choices. They are, however, extremely retiring, and prefer to remain completely out of sight whenever possible. Like their larger cousins, they are fine scavengers, especially after the lights are out. The habit of often hiding under rocks in Nature has earned for them the name 'stone cats' in some areas.

The durability of this rather unique family is certainly evidenced by the successful invasion and survival of ancient ictalurids into the network of underground Artesian springs in the limestone caverns of the Edwards Plateau. One must respect Mexico's blind cave characins, but how much more respect is deserved by these pink and eyeless blindcats, which survived not only the eternal darkness of their realm but at a crushing depth of sometimes thousands of feet below the earth's surface in warm and probably very oxygen-poor subterranean wells. There are at least two species of blindcats, and one of these is appropriately named Satun euryzoma, 'wide-mouthed prince of darkness'.

Several ictalurid species have become established in other parts of the world where they have been introduced. It is hoped that their availability to aquarists will increase, since several are quite desirable aquarium fishes.
A SUBSTANTIAL increase in active members, and a dramatic increase in junior members, was part of the LOYNE A.S. success story for 1968 reported at the Society’s A.G.M. More activities, a wider variety of lectures, and a successful showing in the bream class of funds available was also reported. Good news for members. Mr Eric Smart was appointed president and Mr David Jones accepted the newly formed post of vice-president. Officers elected were: chairman, Mr David Jones; vice-chairman, Mr David Cumpsty; treasurer, Mr Jeffrey Sallis; secretary, Mr Raymond Holmes (6 Kempton Road, Newlands, Lancaster); press secretary, Mr D. Tennant.

Mr James presented the annual prizes. Home aquarium competition: 1, Mr Tom Whalley; 2, Mr David Cumpsty; 3, Mr Arthur Tannant. Table shows competition (cumulative points): 1, Mr and Mrs Derek Stanfield; 2, Mr David Cumpsty; 3, Mr Raymond Holmes. Fish of the Year show: 1, 2 and 3, Mr and Mrs Derek Stanfield (pale chub, M. siphonops, X. halieutus). The chairman congratulated Mr and Mrs Stanfield on their successes at open shows throughout the year, their achievement being crowned with the winning of the Leeds Rose Bowl at the B.A.F. The new Eric Smart trophy, to be competed for by junior members over the whole year, was presented by Mr Smart to Ian Hodkinson.

ALFRETON & D.A.S. entertained HUCKNALL & BULWELL A.S. for an inter-society show at their new headquarters at Alfreton Hall at the end of January when over 60 members and visitors were there. Mr Bower of Worksop A.S. judged the 100 fishes on view and results were:

- Livebearers: 1, Mr Power (H.); 2, Mr Huntington (H.); 3, Mr J. Wright (A.); 4, Mr and Mrs Linder (A.); 5, Mr B. Hickling (A.); 6, Mr and Mrs Linder (A.); 7, Mr and Mrs Linder (A.).
- Flowers: 1, Mr M. Allsop (A.); 2, Mr S. Russell (A.); 3, Mr J. Wright (A.).
- A.S. trophy: 1, Mr M. Allsop (A.); 2, Mr S. Russell (A.).
- Miscellaneous: 1, Mr A. J. Gurratt (H.); 2, Mr J. Wright (A.); 3, Mr M. Allsop (A.); 4, Mr S. Russell (A.).
- Vice-presidents: 1, Mr G. A. Reed (H.); 2, Mr M. Allsop (A.); 3, Mr S. Russell (A.).
- A.A. trophy: 1, Mr M. Allsop (A.); 2, Mr S. Russell (A.).

‘A MOST enjoyable evening’ was the unanimous verdict of the 67 members of HARLECH A.S. who attended the January meeting. Guest speaker was Mr R. J. Millichamp, Fisheries Officer of the Usk River Authority, who spoke on the subject ‘Salmon and its life cycle’ and showed the 16 mm. film ‘Salmon River’ produced by Anglia Television as its contribution to National Nature Week in 1963. Mr Millichamp’s considerable knowledge of the salmon was shown as he dealt with many questions that arose out of members’ interest. The table show for barbs was judged by Mr Alf Ibbotson of Barry A.S. as follows: 1, Mr Peter Garrett; 2, Mr Ron Wilkie; 3, Master Martin Wilkie.

Meetings of the Society are held on the third Tuesday of each month at Caballa Junior School, Colwill Road, Cheadle at 7.30 p.m. Visitors and prospective new members are most welcome.

WAKEFIELD & D.A.S. still has three zeroes for loan at a charge of 101 plus postage. Details may be obtained from the secretary, Mr A. Cotton (64 Burton Road, Wakefield, Yorks.).

THE annual social and dance held by the members of HARLOW A.S. at the Tye Green Community Centre at the end of January brought the club’s fifth year of activity to a triumphant conclusion. A really enthusiastic crowd of club members and visitors gave every sign of vastly enjoying the dancing and entertainment provided—helped along by a fine assortment of refreshments. The Society has enjoyed a very successful year, with its popularity growing in the area until now it has a membership of nearly 100. It does, in fact, play an active part in the community life of the new town and maintains three hospital tanks in the area.


A GOOD growth of Society funds in 1968 and the arranging of a very full programme for 1969 was the pleasant news that was put to members at the A.G.M. of REIGHLEY A.S. The officials who will be carrying out this programme for the year are: president, Mr A. Asquith; vice-president, Mr N. French; secretary, Mr A. B. White (1 Moss Carr Road, Long Eaton, Keighley, Yorks.); treasurer, Mr H. M. Smith; show stewards, Mr
Eddison, Mr Webber and Mr Bickle, newsletter editor, Mr A. B. White; sub-editor, Mr T. Cummins; committee, Mr J. French, Mr P. Dearnley and Mr Crossley.

The table show for January was judged by Mr G. Webber, Mr A. Asquith and Mr A. B. White and prize cards were presented to: livebearers; 1, Mr Liddemore; 2, Master B. Jewell; 3, Mr Cummins A.O.V.; 1 and 2, Mr Dearnley; 3, Mr Cummins. Novice A.O.V.; 1 and 3, Mr Crossley; 2, Mr Place; Junior A.O.V.; 1 and 3, Master Taylor; 2, Master White.

Hounslove & D.A.S. is now organising its social and competitive events for the year. Enormous efforts are being made to make the next open show the best organised that the club has ever run and the election of a committee manager to take charge of the work of the show secretary is a move towards this objective. Membership at the end of last year was approximately 80 and it is hoped to reach the century this year. Activities at fortnightly meetings are being well arranged and very well attended and even in the winter months the club shows are well supported. Results of recent shows have been: Labyrinthia, 1, Mr D. Woodward (three-spot gourami, 77); 2, Mr B. Pratt (giant gourami, 76); 3, Mr R. Abbott (combtail, 75). Characins: 1, Mr S. Moore (Emperor tetra, 76); 2, Mr Eric Shapsoni (sword characin, 75); 3, Mr T. Sands (N. tri- fasciatus, 74). Cichlids: 1, Mr S. Moore (keyhole cichlid, 77); 2, Mr Eric Shapsoni (Hemichromis ingens, 78); 3, Mr R. Backwell (firemouth, 74). A.O.V.: 1, Mr Chris Bunce (T. farinata, 681); 2, Mr D. Woodward (P. flaywaei, 83); 3, Mr D. Grumbles (R. geoffreyi, 84). Cardinalfish: 1, Mr B. Crosby (C. bicinctus, 83); 2, Mr R. Brewer (C. acens, 82); 3, Mr S. Moore (C. acens, 79). A.O.V. cats and loach: 1, Mr H. Shuttleworth (glass catfish, 28); 2 and 3, Mrs R. Brewer (Pomodottus, 77). Other tropical fish: 1, Mrs L. Lewis (black pleco, 73); 2, Mr D. Love (red sword, 76); 3, Mr N. Duke (male guppy, 73).

50 Members of Amersham & D.A.S. who attended the club’s annual social and auction at the Community Centre voted the evening a complete success. A varied entertainment had been arranged, with dancing, games and a fancy dress competition (won by Miss Harding, Mrs Janice Huey and Mr Doug Moody the junior, ladies and men’s sections respectively). Mrs Sheila Harris arranged excellent refreshments and a comedy sketch written and acted by Mr Ray Huey and Mr R. W. T. Smith was very well received. Club activities will be continuing in a more sober, though equally interesting, manner with lectures on British marine aquaria from Mr A. J. Vosper, lectures on furnished aquaria and one on discus by Mr

ARE there any local lecturers who might be available to lecture to SHEFFIELD 2 & D.A.S. in the near future? Secretary Mrs J. Mitchell (1 Nelson Road, Stannington, nr Sheffield) would greatly welcome any offers from lecturers in the area.

Roy Skipper (15th April) as well as home and inter-club table shows.

At the first meeting held at the new headquarters of BASING-STOKE & D.A.S. (the White Hart, London Road), a new attendance record was set when nearly 50 members and friends were present to hear a talk given by Mr J. V. Morrice of Hendor A.S. on furnished aquaria. The talk was illustrated with colour slides and emphasis was placed on the sitting of an aquarium in a room to give maximum decorative effect. At the table show for miniature furnished aquaria, the new novice class was held for the first time. This is to be a regular feature from now on to encourage the many club members who are new to the hobby. Results were: furnished aquaria: 1, Mr F. Lange; 2, Mr D. Walls; 3, Master S. Box. A.V.: 1, Mr R. Ridley; 2, Mr A. Blake; 3, Master S. Box. Novice: 1, Master A. Clark; 2, Mr G. Elliott; 3, Mr N. Stead.

The club secretary’s talk on ‘Water and the Aquarist’ at the second meeting of the month took on a new meaning to the members who braved the gale-force winds and the pouring rain to attend. However, 30 members were there to hear methods for the determination of pH and hardness described and water sources and hazards discussed. pH hardness determinations were carried out on members’ samples by two junior members, Peter and Martin Gough. Table show results were: livebearers: 1, Mr R. Ridley; 2, Mr I. Lamb; 3, Mr A. Blake. A.O.V.: 1 and 2, Mr A. Blake; 2, Mr K. Winslade. Novice: 1, Mr K. Winslade; 2, Mr I. Lamb; 3, Mr N. Stead.

WITF the admittance of the local branch of the F.G.A. to the IRISH FEDERATION OF AQUARIUM SOCIETIES, there are now seven societies in the district around Belfast who will be hosts in turn at the inter-club shows: Belfast, F.G.A., Edenvale, Newtownabney, Short & Harlands, Bangor and St. Anne’s. The knock-out competition will be held on 27th September, with Newtownabney A.S. the hosts. The A.G.M. was very well attended and ambitions are high for 1969. Officers elected were: chairman, Mr G. Stewart; vice-chairman, Mr A. Robbins; secretary, Mr R. McIwaine (15 Rothmore Avenue, Finaghy, Belfast BT10, O.F.T); treasurer, Mr C. McAvoy; show convenor, Mr A. Dunlop; show secretary, Mr R. M. McDonald (31 Doonbeg Drive, Rathcoole, Newtownabney, Co. Antrim); show committee, Mr W. McAuley; Mr A. Robbins; Mr L. Burrows; Mr E. Hiller, Mr W. Bird.

At the next meeting of the I.F.A.S. on 9th March an extraordinary meeting will be held at 2 p.m. to discuss a proposed change in the constitution.

AN A.O.V. marine class was held at the WARRINGTON A.S. January table show and was won by Mr A. A. The very good entry of Mr. T. Characins up to 2 in. 1 and 2, Mr K. Reedy; 3, Mr J. Acock. Loaches up to 2 in. 1, Mr Baker; 2, Mr J. Acock; 3, Mr R. Tench. This meeting was held in the club’s new venue, the Midlands Hotel, and took the form of a party night organised by chairman Mr R. M. Coyle, with fish free and fish Bingo. Meetings are held on every fourth Tuesday of the month and prospective new members will be assured of a warm welcome. Details from secretary Mr A. Addis, 5 Hewitt Street, Latchford, Warrington.

THIS year sees the fortieth anniversary of the founding of BRISTOL A.S. and members intend that 1969 will be a year to be remembered with pride. Officers to carry out this programme were elected at the A. A. meeting: president, Mr H. T. Jago; vice-president, Mr F. Brown; secretary Mr Wilson; assistant secretary, Mr J. Phillips (1, Dairy Road, Eastville, Bristol, 53); treasurer, Mr J. Brown; programme secretary, Mr P. Greenhill; registrar, Miss H. Morgan; show manager, Mr J. Lewis; assistant, coldwater, Mr A. S. G. Stone; assistant, tropical, Mr G. Stone; additional committee members, Mr M. Howe, Mr N. Grimstone, Mr J. Savage, with Mrs Brock, Mr H. C. Thomas and Mr W. Ham co-opted to make a working body of some force. At this meeting, farewell was taken of Mr Ralph Berry, show secretary for two open shows, who is moving from the district. In the table show for shubunkins bred 1968, Mr S. Lloyd took first award with a very good fish (Mr. T. Phillips; 3, Mr R. Berry), and the ladies triumphed in the catfish and loach class with Miss R. Corcoran taking a first, and Mrs C. Allison second and third.
In Brief...

...25 correct answers out of 35 won the quiz slide show for Mr A. Joblings, presented by chairman Mr Roy Hampson at the HORSFORTH A.S. January meeting. The club also heard a commentary by vice-chairman Mr W. Audley on the best tanks in the 1966 Belle Vue show. Mrs J. Dickinson took the award for specified class, catfish and loach. A.O.V. 1, Mrs. J. Dickinson; 2 and 3, Mr D. Corns. Junior A.O.V.: 1, 2 and 3, Mr D. Shaw.

...TWO of the 28 classes in the BRIDGENO & D.A.S. open show on 10th May will be for marine. The club hopes to welcome entries from Scotland and England as they did last year.

...BLACKWATER A.S. elected the following officials at their A.G.M.: chairman, Mr E. N. Gee; vice-chairman, Mr G. F. Yallop; treasurer, Mr R. Mills; secretary, Mr R. Warren (35 Coriander Road, Tiptree, Essex); committee, Mr M. Cable, Mr C. Devall, Mr D. Bird, Mr F. Clayton, Mr M. Folley. The overall winner of the year's table shows was Mr Yallop, who was presented with the trophy by Mr Gee.

...AN old Society re-formed. To be known as the DU RERIES A.S., its headquarters are in Worksop. Mr J. Hutchinson, well-known aquarist dealer is the Society's first president. Secretary, Mrs H. Denton (83 Sparken Hill, Worksop, Notts.) of the husband and wife team who won the Champion of Champions award at the B.A.F. in 1968. Although only formed in January, the Society has already arranged its first Open Show on 24th May.

...NEW secretary for CLAPHAM A.S. is Mr Peter Saunders (142 Victoria Rise, London, S.W.4).

...ASSETS four times larger than last year's was the happy news reported at the GLOSSOP A.S. A.G.M. Officers elected were: secretary, Mr D. R. Chambers (86 Old Road, Hyde, Cheshire); treasurer, Mr D. C. Macdonald; new secretary, Mr Ralph Tarkinson. Mr R. Lee was elected chairman to replace Mr J. Ingram whose business commitments occasioned his resignation. All details and Society calendar from the secretary.

...Mrs J. Mitchell is now secretary of SHEFFIELD & D.A.S. (1 Nelson Road, Stannington, Sheffield). New show secretary is Mr B. White (54 Flockton Road, Sheffield S19QW; Woodhouse 4122).

...FRIDAY night used to be the most suitable evening for meetings in Dorset but members of SHAFTESBURY A.S. feel this is no longer so. Meetings are now held on the first Tuesday of the month at 7.45 p.m. and there is also a new group, Christ's School, Shaftesbury, Dorset. Enquiries from prospective new members will be welcomed by secretary Mr K. Forward (? Pill Meadow, Kingston Magna, Gillingham, Dorset).

...THE LEAMINGTON & D.A.S. home furnished aquarium competition was won by Mr E. Black (83 points for a very nicely set-up tank and skilful use of rocks and rocks). The second award went to Mr D. Ward for a temperate marine tank of 118 gallon capacity, and third to another large tank belonging to Mrs J. C. Smith. The analyses of the tanks published in the Society's Newsletter gives some interesting side-lights on the keeping of furnishing tanks. Out of 17 tanks viewed, there were two tropical and two temperate marine tanks, much skilful use of unusually shaped or unusually coloured rockwork and interesting lighting effects. Above all, perhaps, the report holds out hope for us all. Tanks that had won in previous years were found to be suffering from the usual hazards of wilting plants, insufficient fish etc. Obviously, there is no magic formula; planning and attention to detail wins all and this takes time, which might be available to an individual at any particular moment. Anyway, as Mr Thomas writes in his report: "Remember, what makes one person doesn't suit another and the best tank is your own!"

...MERSEYSIDE A.S. committee elected at the Society's A.G.M. is: chairman, Mr Fred Mulla; vice-chairman, Mr Bill Kelly; secretary Mr R. Moorcroft (2a Frankby Road, Liverpool 4); treasurer, Mr K. Parkes; show secretary, Mr Bill Smith (1 Sunningdale Road, Liverpool 15); news editor, Mrs V. Parkes; librarian, Mr Derbyshe; new committee members, Mr B. Hall, Mr McDermott.

...SECRETARY of WAKEFIELD & D.A.S. for 1969 is Mr A. Cotton (64 Burford Street, Wakefield, Yorks.) and show secretary is Mr J. Hall (144 Barnsley Road, Wakefield). Recent table show winners have been: Specified: 1 and 3, Mr M. Townsend; 2, Mr J. Gray. A.O.V. 1, 2 and 3, Mr A. Cotton. Novice: 1 and 2, Mr J. Hall.

...NEW venue for INDEPENDENT A.S. Headquarters are now at the Holloway Institute, Barnsby Secondary School, Eden Grove, Holloway, London, N.7.

...OFFICERS for KINGTON & REDHILL A.S. for the year are: chairman, Mr B. J. Pawley; treasurer, Mrs R. Greenhal; secretary, Mrs H. Fairhurst (37 Woodstock Avenue, Sutton, Surrey); show secretary, Mr G. E. Greenhal (32 Garth Close, Morden, Surrey); committee, Mr M. Bentley, Mr J. Pollard. The society meets at St Luke's C. of E. Primary School, Eton Road, Kingston-upon-Thames, Surrey.

...Mr B. DUNCAN was awarded first at the table show for barbs held at the BARNSLEY A.S. A.G.M. (2, Mr A. Simpson; 3, Mr R. Abson). Officials elected were: chairman, Mr W. Dewar secretary, Mrs J. Howard (67 Woolley Colliery, Barton, Barnsley, Yorks.); treasurer, Mr R. Abson; show secretary, Mr K. Scoborn (35 Osmond Drive, Worsbrough Bridge, nr Barnsley, Yorks.); committee, Mrs Kaja, Mr Bono, Mr Healy, Mr Simpson, Mr Cockburn, Mr Twiddy.

...MRS P. WHITTINGTON (Pipes Lodge, Ringley Park Avenue, Reigate, Surrey) was elected this year's secretary of SEAFIELD A.S. Chairman is Mr Ivor Steep.

...S. HENDELEY won the first award with a red-finned shark (86 points) at the BETHAL GREEN A.S. on display at the show in January. Judge Mr F. Tomkin awarded Mrs H. D'Ayen place to a red-finned shark belonging to Mr P. Arnold (83) and the terrarium play (82) of Mr J. Day earned third.

...OFFICERS for BRADFORD & D.A.S. for 1969 are: president, Mr A. Firth; vice-president, Mr L. Taylor; secretary, Mr A. R. S. Czarny (4 Mayfield Grove, Wibdon, Bradford); treasurer, Mr A. Daughtrey; social and publicity, Mr K. Meacham.

...A RECRUITING drive is planned by the LIVERPOOL SECTION of the FANCY GUSSY ASSOCIATION. The section, though small, is vigorous and club-show standard good. 'Guppy lovers in Liverpool—join in', is the club's invitation. Meetings are held at Norras Green Boys Club, Townsend Avenue, Liverpool at 2.30 p.m. on the third Sunday of the month. Stock will be made available to new members who can enjoy a comprehensive list of discussions, films, slide, table shows, and lectures this year, as well as the monthly table show. The first of the year was won by a bottom sword (silver star) benched by Messes E. & T. Jeremy.
Record Number of Affiliations to F.B.A.S.

THE popularity of the hobby is reflected in the astonishing increase in the number of societies now affiliated to the Federation of British Aquatic Societies writes F.B.A.S. treasurer Mr R. A. Dove. In 1968 23 clubs applied for affiliation, making a record total of 95 in the Federation. Some societies had not re-affiliated at the beginning of 1969 when notification and affiliation fees were due, and this may be the result of changes of secretary that have not been notified to the F.B.A.S. The 1969 list of societies is given below and club members who think their club should be included are asked to write to Mr Dove (3 Farm Close, Crowthorpe, Yorks.) for a 1969 affiliation form.

Bedfordshire: Bedford, Dunstable.
Berkshire: Bracknell, Didcot, Reading.
Buckinghamshire: Amersham, Bletchley, High Wycombe, South Bucks.
Cambridgeshire: Cambridge.

Hampshire: Basingstoke, Basing Central, Bournemouth, Farnborough, Gosport, I.O.W., New Forest, Portsmouth, Southampton, Winchester.
Kent: Canterbury, Deal, Erith, Medway, North Kent, Sittingbourne, Tonbridge.
Leicestershire: Leicester F.K.
North of England: Ormskirk, Tunstall, Towngate.
Suffolk: Suffolk.
Surrey: Croydon, Guildford, Kingston, Reigate, Roehampton, South Park, Surrey, Weybridge, Woking.
Sussex: Brighton, Crawley, Hastings, Littlehampton, Mid-Sussex, Worthing.

The F.G.B.S. and the Irish Federation are also affiliated organisations.

For all enquiries relating to the Federation and its aims, letters should go to the general secretary (Mr K. Pye, 35 Reeves Road, London, N.W.3).

All matters relating to fish standards, judging of fishes, inclusion of new judges and open shows generally should be addressed to judges and standards secretary (Mr C. A. T. Brown, 19 Third Avenue, London, W.10). Requests for judges’ services must be made to individual judges chosen from the F.B.A.S. approved list.

Enquiries about sale of Federation ties and badges and distribution of judges’ award card stars should be sent to the assistant general secretary (Mr R. Eason, 22 Flambard Avenue, Wensley, Middlesbrough). Sale of Federation publications is done through the publications secretary (Mr S. Mooney, 44 Conson Road, London, N.10).

...CHAMPION fish-identifier of TONBRIDGE & D.A.S. is Mr Alan Peckham, who won the quiz, run by the committee, with 31 marks. Mr Garry Regan was a close runner-up with 30, and Mr Ron Taylor achieved 28 points. Mr I. T. Mathieson won the table show for pencils and headstanders (2, Mr R. Taylor; 3, Mr T. Amos); Mr R. Taylor that for puppies (2, Mrs I. Bellingham; 3, Mr I. T. Mathieson).

...DEWSBURY & D.A.S. officers for the year are: president, Mr R. Ellis; vice-president, Mr J. Thompson; secretary, Mr C. Tennell (Spring Place House, 118 Shillibank Lane, Mirfield, Yorks.); show secretary, Mr J. Thompson; social secretary, Mr G. Scholes; librarian, Mr S. Brown; auditors, Mr D. M. Crowther and Mr I. C. Thorton; liaison officer, Mr M. Pugh; A.Y.A.S. delegates, Mr H. Hall, Mr M. Woodcock; F.N.A.S. delegates, Mr A. Bradley, Mr G. W. Cooke.

...41 members of AIREBOURNE & D.A.S. heard fellow club member Mr C. Thompson give a most interesting talk on fish-house electricity, and then enjoyed the slide show that followed of tanks entered by members in the home furnished-aquaria competition. The monthly table show results (rasboras, danios, minnows) were: advanced: 1, Mr R. Lister; 2 and 3, Mr and Mrs E. Robinson. Novice, 1, 2 and 3, Mr J. Kay, Junior, 1 and 2, Mrs A. Fleshier. The fish of the month award went to Mr R. Lister.

...A VERY successful year was reported at the second A.G.M. of HUCKNALL & BULLWELL A.S. A Tropical Fish Exhibition had been staged successfully and the excellent attendance compensated for the difficulties encountered. A first Open Show was a great success. Funds were spent and activities thriving. Officers elected were: president, Mr T. Smith; chairman, Mr T. Power, vice-chairman, Mr Simpson; secretary, Mr M. Harrington; treasurer, Mr M. Vickers; show secretary, Mr T. Smith; assistant treasurer, Mr A. Reid; librarian, Mr B. Kirk; entertainments, Mr T. Kirk; publicity, Mr J. Foster (5 Greenwood Vale, Hucknall, Notts.); show committee, Mr A. J. Garrett, Mr J. Johnson. The Annual Shield for the society’s table shows was presented to Mr A. J. Garrett.

...CHANGE of officers for RIVER-SIDE A.S. Mr R. Nibbons is chairman for 1969, Mr F. G. Sanders (15 Wilton Avenue, London, W.4) is secretary and Mr M. Goss the show secretary. New members can join in visits planned during the next few months to fish breeders, public aquarisms and trips to the coast. The table show for the Roy Biggs Cup, judged by Mr B. Senior, was won by Mr R. Nicol.

...HASTINGS & BEXHILL A.S. have enjoyed a fine year, but from Horsforth A.S. that included one by Mr Brat Walker on unusual fish that can be kept in an aquarium; and a talk by Mr Barry Funnel on the history of fishkeeping from the ancient Romans to the present day.
Table show results have been:
livebearers (except guppies): 1. Mr T. McCormick; 2. Mr J. Grainger; 3. Mr G. Chalcraft; 1. Mrs Daisy
aquaria: 1. Mr J. Watson; 2. Mr G. Chalcraft; 3. Mr A. Martin.

...WHEN BURTON & D.A.S. showed the slide/tape lecture 'The American Scene' the audience was the largest for years and emphasised the progressive trend the club is enjoying. The table show was won by Mr B. Pinto; 2. Mr J. Quinn; 3. Mr J. Thompson. At the presentation at the annual dinner, Mr J. Hunt won the Points Cup, and the trophies for best tropical fish and best coldwater fish. Tropical furnished aquarium, Mr T. Cottam; junior aquatic of the year, G. Freeman. Meetings are held on the second Thursday of the month at the Fox & Goose, Bridge Street, Burtonon-Trent.

...COVENTRY POOL & A.S. are trying hard to find a more central venue for meetings. In the meantime a widely varied programme has been devised for the year to include talks on fish physiology, tropical and coldwater fish and feeding, quizzing, table shows and visits to other M.A.L. societies. Fishkeepers who would like to join in should contact secretary Mr J. Grant (26 Cecil Road, Coventry) or go along to a club meeting on the second Wednesday of the month at 7:45 p.m. to meet the lettuce eater.

...THE 1966 committee for MERSEYSIDE A.S. is: chairman, Mr F. Mullis; vice-chairman, Mr W. Kelly; secretary, Mr R. Moore; treasurer, Mr K. Parkes; show secretary, Mr W. Smith; librarian, Mr J. Derbishire; news letter editor, Mrs V. Parkes; additional committee members, Mr J. McDermott, Mr B. Hall.

...YORK & D.A.S. chairman for 1966 is Mr E. Leadley; vice-chairman, Mrs H. Simons; editor, Mr G. B. Hawkins; show secretary, Mr P. Carey; librarian, Mr M. Allison; judges at table shows, Mrs J. Hills and Mr A. Hargrave; new committee members, Mr W. Murray, Mr H. Carey, Mr D. Winteringham, Mr G. A. Thiel continues as treasurer, and Miss H. Benwick as secretary (2a Grange Garth, Fishgate, York). Final results for the table show competition 1965 are: Open class: 1. Mr G. Pyeott; 2. Mr M. H. Cooper; 3. Mrs F. Carey. Novice class: 1. Mr A. Hargrave; 2. Mr M. Maude; 3. Mr P. Waddington. Junior class: 1. Mr R. Hadfield; 2. Master M. Rhodes; 3. Master P. Carey.

Badge of the Month

Although it is less than 2 years since the Society was formed LOUGHBOROUGH & D.A.S. has been very active in successfully staging a number of events such as the M.A.A.S. Open Show and Convention and their own first open show. This year's open show takes place on 8th June. Lectures, slide shows and table shows are all regular features of the Society's meetings. Newcomers are invited to contact the secretary, Mr F. Hopewell 61 Morley Street, Loughborough (phone 3769) for details.

...WALTHAMSTOW & D.A.S. meets at 8.30 p.m. on the first Friday and third Wednesday of each month at Winns Avenue School, London, E.17 (near Llyod's Park).

Dates for Your Diary

9th March, HUDDERSFIELD T.R.C. Open Show, Druid Hall, St. Paul's Street, Huddersfield. Schedule from Mr Eric Kaye, 53 Cliff Road, Holmfirth, Huddersfield, Yorks.

15th March, TOP TEN AQUARISTS Tropical Fish Show and Exhibitions, Huddersfield Town Hall. Details from Mr R. Kaye, 53 Cliff Road, Holmfirth, Holmfirth, Yorks.

19th March, STOCKBRIDGE & D.A.S. second Open Show, Victory Club, Manchester Road, Stockbridge, Nr Sheffield.


29th April, READING & D.A.S. Open Show, Brook Barns, Oxford Road, Reading.

26th April, SHEFFIELD & D.A.S. Open Show, Meadowbrook Venue, 191 Broomhall Park Road, Sheffield, S. Yorks.

26th April, THURROCK A.S. Open Show, Upper Lane, Grays, Essex. Last entry 11.0 p.m. Schedules from Mr D. C. M. Durrant, 23 Kingsman Road, Stanford-le-Hope, Essex.

27th April, BURY & D.A.S. Open Show, Trinity School, Trinity Street, Bury, Lancs.

27th April, BURY & D.A.S. Open Show, Trinity School, Trinity Street, Bury, Lancs.

1st May, SOUTHEND, LEIGH & B.S. Open Show. The Municipal College, Victoria Drive, Southend-on-Sea. Further details from Mr B. P. Pearsall, 39 Grafton Road, Canvey Island, Essex.


Aston Old Road, Nr Openshaw, Manchester 11. Show secretary, Mr M. Hoyle, 126 Horton Road, Reddish, Stockport.

25th April, SHEFFIELD & B.A.S. Open Show, Meadowbrook Venue, 191 Broomhall Park Road, Sheffield, S. Yorks.

20th May, BRIDGENG & D.A.S. second Open Show. Bridgeng Y.M.C.A.


24th May, HULL A.S. second Open Show. Railway Institute, Anlaby Road, Hull. Details from Mr F. M. Shepherdson, 17 Beech Grove, Beverley Road, Hull.


22nd May, RAINWORTH & D. A.S. Open Show. At Showrooms, E. Taylor & Sons, West End Garage, West Gate, Southwell.

22nd May, MIDLAND AQUARISTS LEAGUE (Covellite Pool and Aquarium Society host). Foleshill Community Centre, Foleshill Road, Coventry.

24th May, THURSOMPTON A.S. Open Show. Private Secondary Modern School, Cranmer Road, Taunton. Schedules from Mr D. J. Ramsey, 22 Parklands Road, Wellington, Somerset.

25th May, WARRINGTON A.S. Open Show. Show secretary, Mr J. Hopson (phone Warrington 29393).


31st May, HARLECH A.S. first Open Show. Goballs Junior School, Colwall Road, Harlech. Show schedules from Mr P. B. Garner, 71A Moorland Road, Cardiff.

4th May, KINGSTON & D.A.S. Open Show, St Luke’s Social Centre, Elm Road, Kingston, Surrey. Schedules from Mr G. Greenhill, 59 Garth Close, Morden, Surrey.

1st June, NUNEATON A.S. second Open Show. Schedules from Mr G. Cox, 56 Manor Court Road, Nuneaton.

1st June, BOURNEMOUTH A.C. Open Show. Kinson Community Centre, Felthams Park, Bournemouth. Schedules and entry form after 1st April from Mr Jack V. Jeffery, 38 Basket Avenue, Southbourne, Bournemouth BH6 4JF.

17th June, BOSTON A.S. Open Show.

7th June, YEovil & D.A.S. second Open Show. Yeovil Royal Show. Schedules ready and April from Mr K. Blake, 13 Glenborne Avenue, Yeovil.

8th June, GLOSSOP A.S. Open Show. The Adult Education Centre, Talbot Road, Glossop. Details from Mr D. B. Chambers, 86 Old Road, Hyde, Cheshire.

8th June, LOUGHBOROUGH & D.A.S. second National Furnished Aquarium Exhibition. Loughborough Town Hall, Benchin, 11.30 a.m. to 1.30 p.m., judging 1.30 to 3.30 p.m. Schedules later from Mr J. F. Firth, 81 Peart Road, Loughborough, Leics.

8th June, STRIFORD & D.A.S. Open Show. Schedules from Mr J. E. Jackson, 25 Dunford Avenue, Urmston, Manchester.

14th June, SOUTHAMPTON & D.A.S. Open Show. St Deny’s Church Hall, Southampton. Details from Mr C. McCann, 7 Waterhouse Way, Southampton, SO1 3FA.

14th June, LLANTWIT MAJOR A.S. Open Show. Town Hall, Llantwit Major, Glam.

19th June, BRIGHTON & SOUTHERN A.S. Open Show (provisional).

18th-22nd June, SECOND NATIONAL Furnished Aquarium Exhibition. St George’s Hall, Bradford.

21st June, BRACKNELL & D. A.S. Open Show. The Friethwood Community Centre, Friethwood Court Road, Bracknell. Details from Mr Len Little, 125 Shepherds Lane, Bracknell.

22nd June, COVENTRY POOL & AQUARIUM SOCIETY Open Show, Foleshill Community Centre, Foleshill Road, Coventry. Schedules from Mr C. J. Grant, 26 Cecil Road, Coventry.

22nd June, ALFRETON & D.A.S. Open Show. Alfreton Hall, Alfreton. Details from Mr S. Hill, 35 South Street, Riddings, Derby.

26th-28th June, BRISTOL T.C.F. Open Show. Enquiries to Mr E. Newman, 71 Somerdale Avenue, Knowle, Bristol 4.

27th June, MEDWAY A.S. third Open Show. St John Fisher School, Chartham, Kent. Show secretary, Mr G. A. Craft, 73 Dargess Road, Waldersgate, Chartham, Kent.

2nd July, BASINGSTOKE & D.A.S. Open Show (incorporating the THREE COUNTIES and THREE WARDS, Section F.G.B.S. shows). Carnival Hall, Basingstoke. Details from Mr A. Blake, 50 Bounty Road, Basingstoke.

6th July, LEAMINGTON & D.A.S. fourth Open Show. Details from Mr F. H. Smith, 150 Brunwick St, Leamington Spa, Warwick.


20th July, BARNESLEY A.S. Open Show. Woodmore Sports Centre, Carlton, Barnsley, Yorks. Schedules from Mr K. Southern, 27 Osmond Drive, Worsbrough Bridge, Barnsley, Yorks.


22nd August, HULL A.S. Open Show (as part of the HULL SHOW) East Park, Holderness Road, Hull. Details from Mr P. M. Shepherdson, 11 Beech Grove, Beverley Road, Hull.

22nd-26th August, PORTSMOUTH A.S. Open Show. Portsmouth Community Centre, Twyford Avenue, Portsmouth. Schedules from Mr J. Stillwell, 34 Salisbury Avenue, Copnor, Portsmouth, PO1 6LD.

24th August, OSRAM A.S. Open Show. The Recreation Hall, Refuge Street, Shaw, Oldham, Lancs. Benchin 12.0 to 2.15 p.m.

7th September, REIGATE & REDHILL A.S. Open Show. Purley Library, Chandlers Ford, Hampshire. Schedules from Mr A. Smith, 13 Chawton Road, St Albans, Herts.


20th September, HOUNSLOW & D.A.S. Open Show (to be confirmed), Youth Centre, Cecil Road, Hounslow. Schedules from Mr A. Smith, Andora House, 4 The Greenway, Hounslow, Middlesex.

16th-17th October, BRITISH AQUARIISTS’ FESTIVAL, Belle Vue, Manchester.


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**244 VAUXHALL BRIDGE ROAD, LONDON, S.W.I. Telephone: 01-834 5179**

### ANGLE IRON TANKS
- 18 x 10 x 10 in. £2.00
- 12 x 8 x 8 in. £1.50
- 8 x 6 x 6 in. £1.00
- 6 x 5 x 5 in. £0.50
- 4 x 4 x 4 in. £0.25

### STAINLESS STEEL TANKS
- 18 x 10 x 10 in. £2.00
- 12 x 8 x 8 in. £1.50
- 8 x 6 x 6 in. £1.00
- 6 x 5 x 5 in. £0.50
- 4 x 4 x 4 in. £0.25

### 3-D BACKGROUNDS
- For 18 x 12 x 10 in. tanks £1.47
- For 12 x 8 x 6 in. tanks £0.97
- For 8 x 6 x 6 in. tanks £0.47
- £1.00 per sq. in.

### PUMPS AND FOUNTAINS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bubbling fountains</td>
<td>12 x 8 in.</td>
<td>£7.95</td>
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<tr>
<td>Float Assembly</td>
<td>£1.10</td>
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<tr>
<td>Charm 300 Cent.</td>
<td>£1.10</td>
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<tr>
<td>FW 15 0 complete</td>
<td>£1.10</td>
<td></td>
</tr>
<tr>
<td>Charm 300 Complete</td>
<td>£1.10</td>
<td></td>
</tr>
<tr>
<td>SW 10 0 complete</td>
<td>£1.10</td>
<td></td>
</tr>
<tr>
<td>SW 0 complete</td>
<td>£1.10</td>
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<tr>
<td>SW 0 0 complete</td>
<td>£1.10</td>
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### HEATERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</tr>
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<tbody>
<tr>
<td>Ex. Ex. Plant</td>
<td>£7.00</td>
<td></td>
</tr>
<tr>
<td>Ex. Ex. Round</td>
<td>£7.00</td>
<td></td>
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<tr>
<td>Ex. Ex. Flat</td>
<td>£7.00</td>
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<tr>
<td>Inner Pkt.</td>
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<tr>
<td>Solar Preheat</td>
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### COMBINED HEATER & THERMOSTAT

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>100, 150, 200</td>
<td>£7.00</td>
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</tr>
<tr>
<td>200, 250, 300</td>
<td>£7.00</td>
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### THERMOSTATS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Uno Regular</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Reg.N/N breaking</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Inside Control</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Outside Control</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Combi Top</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Combi Top N/N breaking</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Motor</td>
<td>£1.50</td>
<td></td>
</tr>
<tr>
<td>Uno Single</td>
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</tr>
<tr>
<td>Uno Double</td>
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### OUTSIDE FITTING THERMOSTATS

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>Spring-Act.</td>
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</tr>
<tr>
<td>Contactor</td>
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</tr>
<tr>
<td>Contactor Q.K.</td>
<td>£1.50</td>
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</tr>
<tr>
<td>Contactor J.J.</td>
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<td></td>
</tr>
<tr>
<td>Silvastat</td>
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### THERMOMETERS

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<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>Hygro Spirit</td>
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<tr>
<td>Hygro Spirit</td>
<td>£1.50</td>
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<tr>
<td>Hygro Spirit</td>
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<tr>
<td>Hygro Spirit</td>
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### CULTURE

### HEATER HOLDERS

<table>
<thead>
<tr>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>Windmill Hanger</td>
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<tr>
<td>Windmill Hanger</td>
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<tr>
<td>Windmill Hanger</td>
<td>£1.00</td>
<td></td>
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<tr>
<td>Windmill Hanger</td>
<td>£1.00</td>
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<tr>
<td>Windmill Hanger</td>
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### NETS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Nylon net</td>
<td>£1.00</td>
<td></td>
</tr>
<tr>
<td>Round Silk net</td>
<td>£1.00</td>
<td></td>
</tr>
<tr>
<td>Round Glass net</td>
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### BREEDING TRAPS

<table>
<thead>
<tr>
<th>Model</th>
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<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windmill combined breeding and rearing</td>
<td>£1.00</td>
<td></td>
</tr>
<tr>
<td>Windmill combined breeding and rearing</td>
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<tr>
<td>Windmill combined breeding and rearing</td>
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### AQUAMASTIC

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1 lb. tin</td>
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</tr>
<tr>
<td>2 lb. tin</td>
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</tr>
<tr>
<td>2 lb. tin</td>
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### DUROGLOST

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>Water hardening kit</td>
<td>£1.00</td>
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</tr>
<tr>
<td>10 steals of glass</td>
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</tr>
<tr>
<td>10 steals of glass</td>
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### MISCELLANEOUS

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<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>Hydro-Sheet</td>
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<tr>
<td>Hydro-Sheet</td>
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<tr>
<td>Hydro-Sheet</td>
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<tr>
<td>Hydro-Sheet</td>
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### OTHER FOODS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Chilled meat</td>
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<tr>
<td>Shrimp Meal</td>
<td>£1.00</td>
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</tr>
<tr>
<td>Turtle Food</td>
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<tr>
<td>Infant Power</td>
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### HABITAT

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
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<tbody>
<tr>
<td>Hygro Silicone</td>
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<tr>
<td>Hygro Silicone</td>
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<tr>
<td>Hygro Silicone</td>
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### RUBBER SUCKERS

<table>
<thead>
<tr>
<th>Model</th>
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<tbody>
<tr>
<td>Knob type</td>
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<tr>
<td>Knob type</td>
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<tr>
<td>Knob type</td>
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</table>

### WHITEWORM CULTURE

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smalls</td>
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<td></td>
</tr>
<tr>
<td>Smalls</td>
<td>£1.00</td>
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</tr>
<tr>
<td>Smalls</td>
<td>£1.00</td>
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</tbody>
</table>

**ESTIMATED APPROXimate POSTAL CHARGES:**
- Aquaria, Plants, Gravel, Mastic, and Rockwork, at owners' risk—carriage at cost invoiced
- 5th for orders up to 10-50; 6th for orders up to 20; 7th for orders up to 40; 8th for orders up to 60; 9th for orders up to 90; 10th for orders up to 120

---

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WARWICKSHIRE
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Water Plant Nurseries and Fish Hatcheries

1969 POND SEASON

OUR EXTENSIVE GARDENS OPEN APRIL 1st
AND ARE OPEN ON EASTER MONDAY

WE HAVE AN EXCEPTIONAL SELECTION
OF NISHIKI KOI JAPANESE COLOURED CARP

3 - 4" FISHES FROM 30/- EACH
5" - 6" FISHES FROM 60/- EACH
10" FISHES FROM £15 AND 12" FROM £25

BRISTOL SHUBUNKINS
1\(\frac{1}{2}\) YEAR OLD FROM 15/-
2\(\frac{1}{2}\) YEAR OLD FROM £5
(all wintered in open pools)

TROPICAL
AQUARIUM
PLANTS
Water Orchids 10/-
Madagascar Lace Plants 15/-
King of Aponogetons 10/-
Ruffled Sword Plants 15/-
Melon Sword Plant 15/-

Special Offer: 1 of each of above for 55/-

SALTWATER
AQUARIUM
FISHES
We are the most experienced firm in marine fish
keeping. Our stocks are always well quarantined and
acclimatised.

Specialists in Invertebrates and other interesting Marine Animals—also Plants

REMEMBER—FOR SUCCESSFUL MARINE AQUARIA ALWAYS USE
NEW TROPIC MARIN ARTIFICIAL SEA SALT WITH GUARANTEE

TROPICAL & HARDY AQUARIUM PLANTS. OVER 200 SPECIES GROWN. SEND S.A.E. FOR LIST

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HOURS OF BUSINESS—Weekdays 10 a.m.—5 p.m. Sundays 10 a.m.—12.30 p.m. for sale of plants only. CLOSED ALL DAY EVERY MONDAY

TERMS OF BUSINESS—Cash with order please. Fish sent by rail. Tropical minimum order £7-10s., insulated container and carriage 10/-. Cold water minimum order £5 plus 10/- can and carriage. Plants by post (minimum order 10/-) please add 3/6 post and packing.