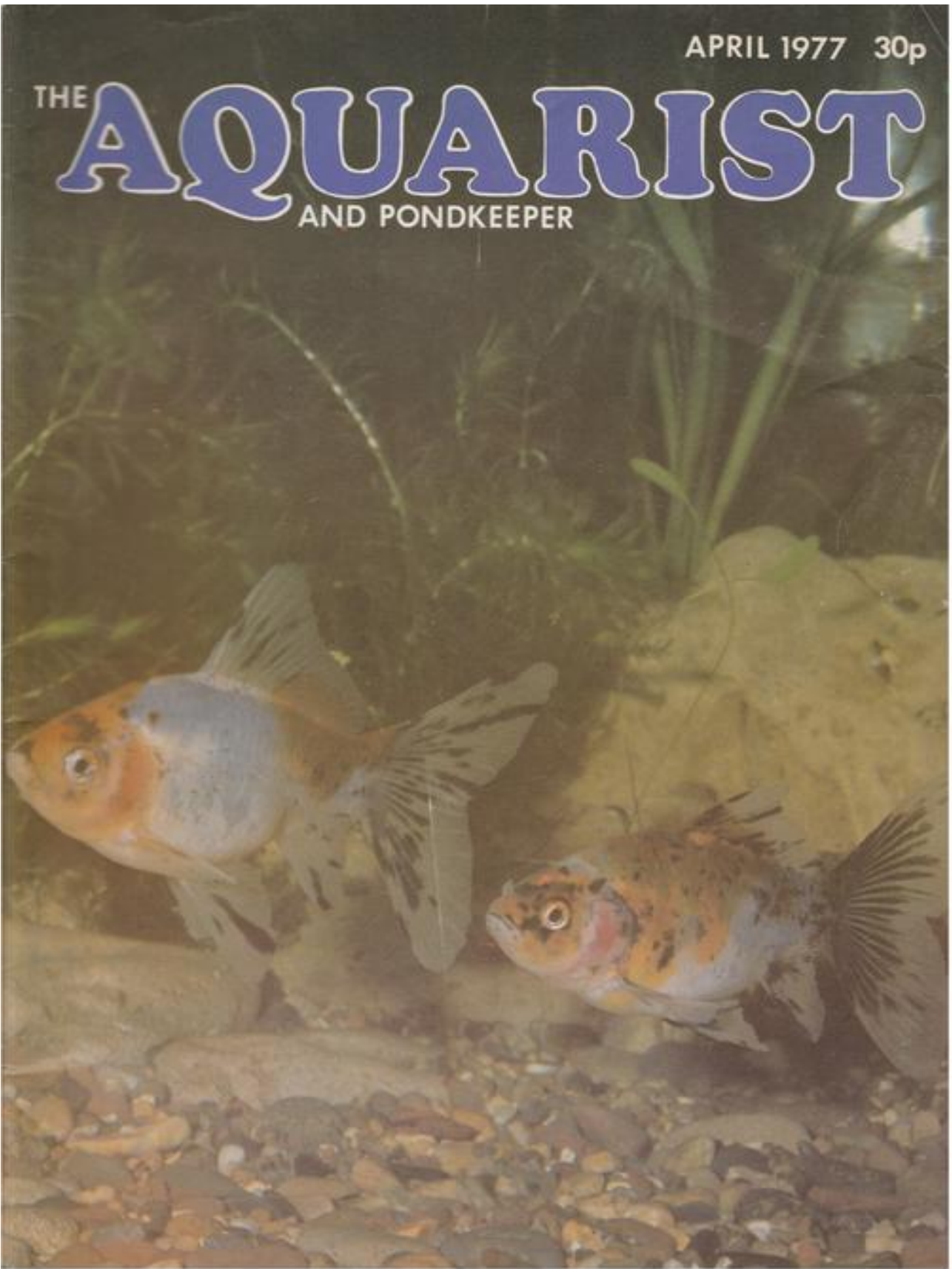


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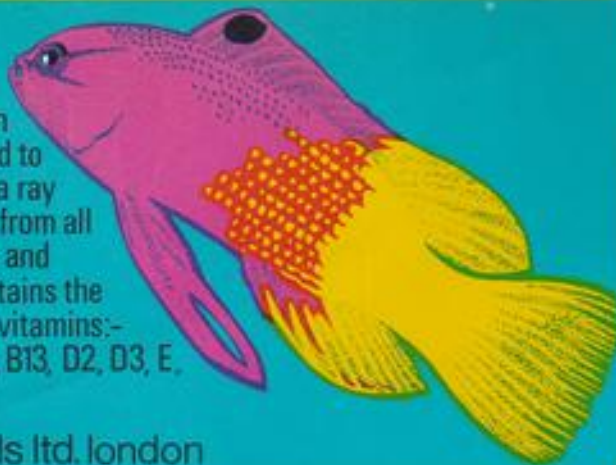
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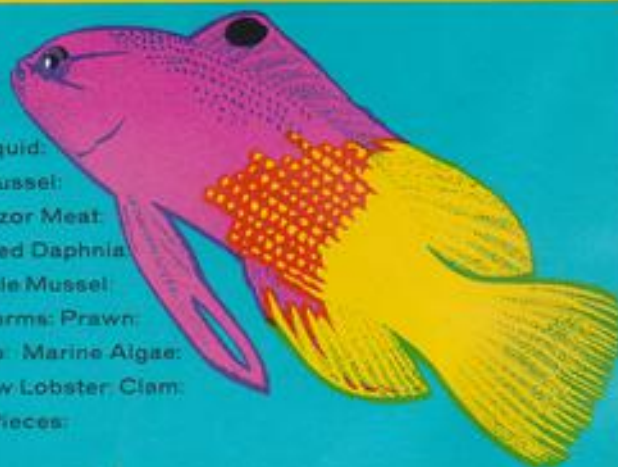


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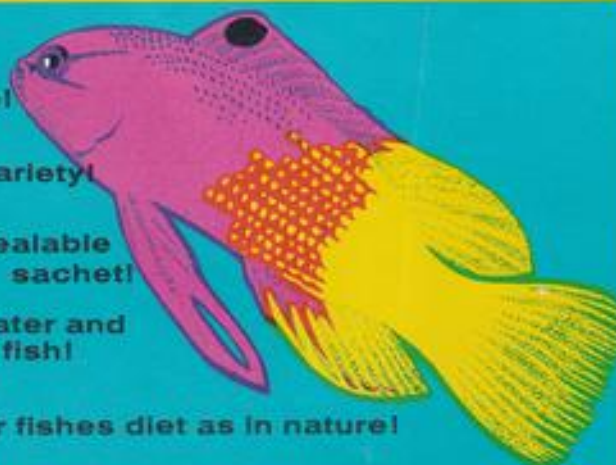
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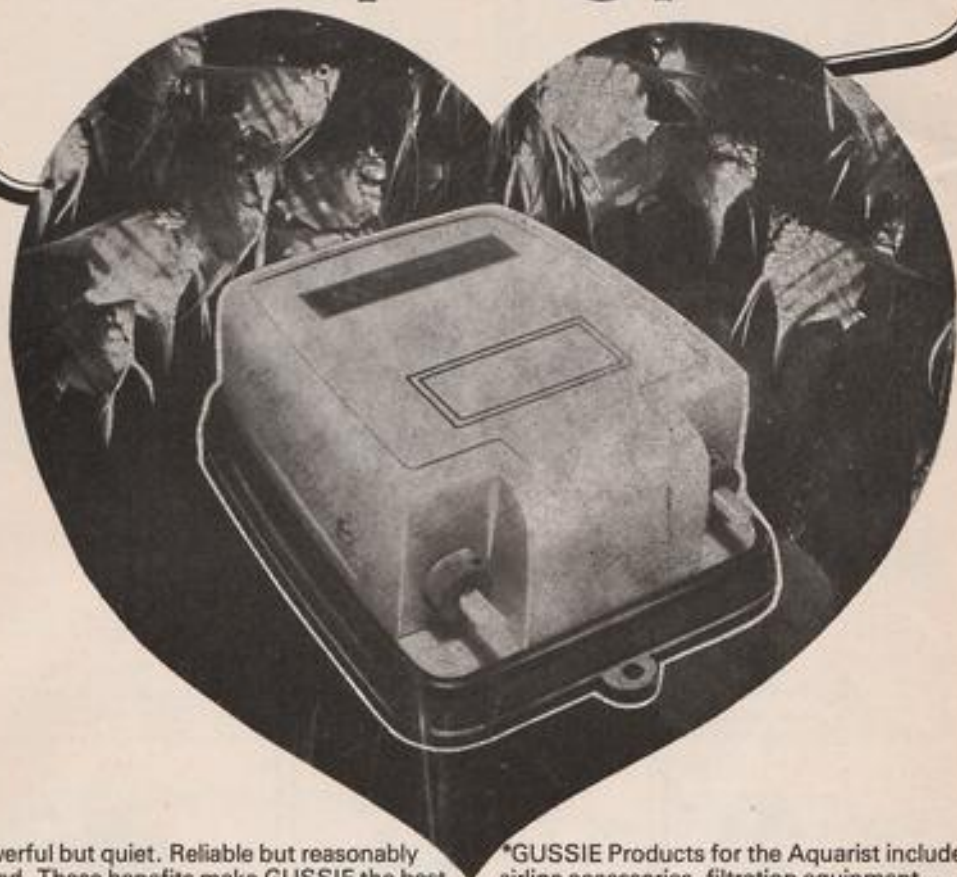


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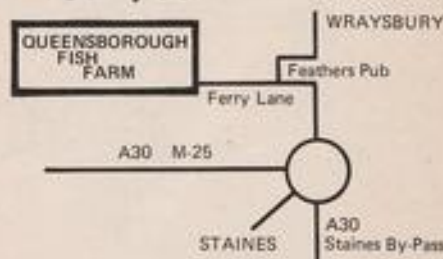


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The RB 120 & 136 Series consists of sliding-vane type rotary vacuum pumps/air-compressors.

General design

The machine consists of a slotted rotor fitted with sliding vanes. The rotor is mounted on the electric motor shaft in a rigid integral construction, and is offset in relation to the bore of the stator.

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Electric motor tolerances are specially controlled to ensure that fine internal clearances are maintained in the pump. Critical internal surfaces are lapped and honed to a mirror-like finish to improve the blade life and efficiency. The mounting of the rotor on to the motorshaft, while increasing rigidity, also enables the end cover to be easily removed so that a blade change can be made in a few moments. This operation can be accomplished without disturbing any pipework. Electric motors suitable for single phase, dual frequency (50/60 cycle) are available on both models. Three-phase electric motors are also available on the RB 136. Electric motor protection by an automatic re-set overload device is provided on the RB 136.

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Stator, end covers and rotor: high-quality close-grained cast iron.

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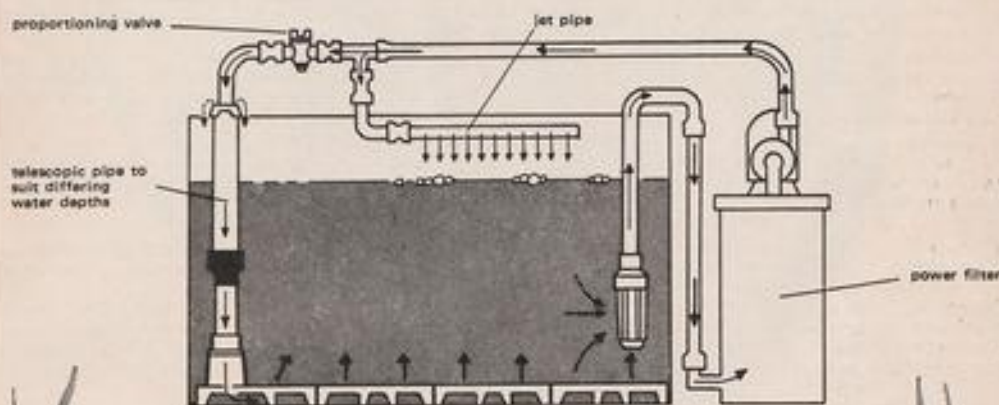
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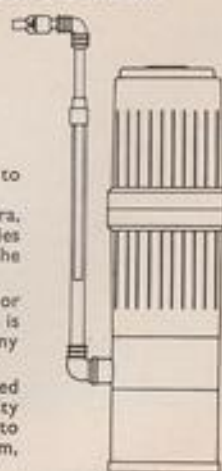
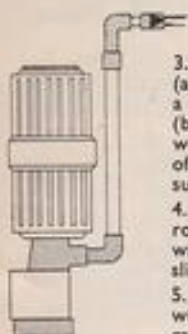
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NEWPET PRODUCT REVIEW

THE MARTIN FULLY SUBMERSIBLE TURBINE FILTER SYSTEM

1. **Powerful.** Output as follows:—
Martin 300 56 gals/hour
Martin 400 125 gals/hour
2. This power is spread over a large filter area:—
Martin 300 35 square in.
Martin 400 81 square in.



3. **Aeration** is by one of two methods:
(a) a venturi nozzle provided with the filter, which sucks in air up to a depth of 8 in. and bubbles it out in the return waterstream.
(b) by means of a spray boom, which is available as an optional extra, which effects the return of the water to the aquarium through a series of fine jets directed over the water surface. This greatly increases the surface area, and therefore the facility for gaseous exchange.
4. **Silent**—the motor generates a magnetic field in which the impellor rotates (the only moving part in the whole filter). This impellor is water lubricated, consequently developing minimum noise, and any slight hum is immediately deadened by the enveloping water.
5. **Size.** The Martin power unit is extremely small when compared with other power filters of comparable output, due to its simplicity rather than its refinements. The principle of operation being to circulate the water rather than to pump it in and out of the aquarium, thereby effecting a much larger output from a much smaller unit.
6. **Transposition.** The Martin filter unit is so simple to install. Merely place the unit in the aquarium wherever you desire it and switch on! In order to transfer the filter to another aquarium simply switch off, lift filter out of the tank, transfer to your next aquarium, and switch on! Anyone can use a Martin filter—it is so simple.
7. **Concealment.** In aid of this aspect of it is possible to either lie the filter flat along the surface of the gravel behind the plants, or to stand it upright (e.g. in a corner) but with the motor unit buried in the gravel. This only leaves the capsule exposed which is a mere 3.5 in. long by 3 in. in diameter and is coloured a dull green which merges easily with the background plants of the aquarium.
8. **Maintenance.** The Martin filter is specifically designed to minimise maintenance and attention. A simple cleaning routine is all that is required when the reduced flow of aeration indicates a reduction in efficiency. The filter cartridge is then cleaned or replaced, and the impellor and chamber is cleaned of any algae growth that may have occurred. No further maintenance is required.
9. **Safety.**
(a) to the user:—There are no exposed electrical parts anywhere in the Martin filter, and the construction conforms to E.E.C. regulations, and has been recently approved by SEMKO for sale in Sweden, which may not mean very much in the U.K. but it is a sign that the pumps are technically very good.
(b) for the aquarium occupants:—The Martin filter capsule has a perlator running through its core, which effectively spreads the suction created by the impellor throughout the entire length of the capsule, which in turn distributes this evenly across the entire 35 sq. in. of filtering area. In practical terms this means a filtering area 7 times greater than from a conventional filter of similar size, and secondly a spread of suction, so that even small fish are not in danger of being sucked into the filter.
10. **Versatility.** The Martin filter can be used with any filtering medium, e.g. wool, carbon, peat, resins, dolomite, etc. This is by the addition or substitution of a "2K" capsule, which includes two gauze baskets to contain the material, attached to the perlator. No further adaptation is necessary.
11. The Martin filter is suitable for both fresh and salt water applications, and is covered by a full 12 months unconditional warranty, if in any way the parts, materials or labour, used in manufacture, are found to be defective.

Conclusions. In short:—Powerful, versatile, efficient, simple, safe, silent, and last but not least—value for money.

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Wundpets Ltd., London Road, Twyford, Reading. Tel: Wargrave 3066.
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The appearance of the SeAquariums Nitrite Test Kit in 1969, offering as it did for the first time super-sensitivity in an aquatic test kit, was a great achievement for the British aquatic hobby industry and set a standard of excellence which foreign (—and native!) competitors have failed to match to this day.

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Vol. XLII No. 1, 1977

Editor: Laurence E. Perkins
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Our Cover:
Bristol Shubunkins

April, 1977

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Julidochromis species

by Steve Wolstenholme

THE *Julidochromis* species first entered the aquatic hobby in the late 1950's in the form of *Julidochromis ornatus* and *J. transcriptus*. The latter was known in the hobby at that time as *J. marlieri*. This crossed identification was not sorted out in most aquarium books until about 1972. Although *J. ornatus* remained available by way of tank bred specimens for a few years it gradually, along with *J. transcriptus*, faded into the ranks of fishy stories and pretty pictures of unobtainable fish. In the late 1960's they re-appeared bringing with them *J. regani* and the real *J. marlieri*. The supply was not large but the aquarist who really wanted *Julidochromis* could obtain them. Other than a drop in imported stock from 1972-1975 they have been available ever since.

Julidochromis names are often applied incorrectly, or names of convenience are made up for new species or new colour varieties. The names are in general the names of the points of capture. These "new" species are often intermediate between *J. regani* and *J. marlieri*. An exception to this name-tagging is the recently discovered *J. dickfeldi* from the Zambian end of Lake Tanganyika.

<i>J. ornatus</i>	Boulenger	1898	} All valid species.
<i>J. marlieri</i>	Poll	1956	
<i>J. regani</i>	Poll	1942	
<i>J. transcriptus</i>	Matthes	1959	
<i>J. dickfeldi</i>	Staack	1975	

J. davidi Name applied for a short time to an unnamed species of *Lamprologus* in the early 1970's.

J. brichardi Name applied to *Chalinochromis brichardi* when first imported.

J. ocellatus Steindachner 1909 No longer valid, probably *Lamprologus*.

J. elongatus Steindachner 1909 Probably *Lamprologus steindachneri*.

J. boulengeri Steindachner 1909 Probably *Lamprologus boulengeri*.

Other names will usually be temporary trade names put on difficult-to-classify varieties.

The best known *Julidochromis* is *J. ornatus*; it has frequently been bred in captivity but because of the fact that a pair of this species will rarely produce more than 40 fry per spawn it is becoming less available. *J. transcriptus* also produces small broods but it is, however, quite frequently imported and thus more readily available than *J. ornatus*. By far the most frequently seen species at present are *J. marlieri* and *J. regani*. Both these species regularly produce broods in excess of 200, on occasions flooding some areas of the country with young tank-bred stock. *J. dickfeldi* has been bred in England from German produced stock. Only 12 live specimens have been transported from Zambia to Germany at the time of writing. Probably the species would be unknown in the hobby had it not been for the fact that a number of aquarists were present on the collecting trip in January 1975 to the southern end of Lake Tanganyika. No doubt commercial collectors will soon be exporting them.

The aquarium for housing *Julidochromis* should not be less than 10 gallons. It should contain a number of large rocks arranged to form caves compatible with the size of the fish. A thin layer of gravel can be spread between the rocks if desired. The water should be at about 76°F and of a pH and hardness as close to that of Lake Tanganyika as is possible. The optimum conditions are pH 9.0, 300 p.p.m. Ca. CO₃; however, it should be noted that when a tank is operated at such high pH level the production of nitrites is increased greatly thus a frequent and large water change will be needed or some form of biological filtration must be included in the system. Some aquarists prefer to keep the fish in hard, neutral water thus avoiding the nitrite problem to some extent. One complicating factor with the frequent water changes is that unlike their cousins in Lake Malawi, Tanganyika cichlids do not take too well to large changes of water. It does not seem to cause them any distress but rather seems to increase their activity to the point of becoming aggressive, sometimes resulting in the death of the smaller ones.

Breeding *Julidochromis* is quite a simple matter once a compatible pair has been obtained. The easy way to do this is to buy a few of one species and put them in the same tank. After a short while one or more will be seen to be staying well away from the "battle" in the top corners of the aquarium. Remove these until only two remain; you now have a pair. The experienced *Julidochromis* keeper can often pick compatible pairs in dealers' tanks thus avoiding the expense of buying a few at a time. *Julidochromis* are rarely below £2 each and can be as much as £15 for larger wild caught ones. (*J. dickfeldi* is still in another league when it comes to money). A pair of *Julidochromis* will spawn on a cave roof suspending the eggs upside-down. They may guard them together, individually or not at all. The eggs will hatch after 4 or 5 days at 76°F and the fry will become free-swimming after another 3 or 4 days. The fry can take newly hatched brine shrimp and microworms

without difficulty. They do, however, grow faster if fed on a good brand of powdered dry food. The parents never eat their fry and can be left with them all the time until the fry become a threat to the adults, then they may be killed but not eaten. By the time the fry are $\frac{1}{2}$ inch long the parents will have spawned again. After a few months the larger fry should be removed to prevent overcrowding. Should this happen the adult fish may declare war and the pair bond may break. If this appears to be happening the adults should be moved to another tank and they may then re-establish the bond.

Julidochromis are cichlids for the aquarist who wants something a little different without straying too far from the basic techniques of fishkeeping. They are also for the East African cichlid specialist who wants to study one group in depth. They are primarily for the person who likes pretty fish and can stand a little bit of initial fin-nipping.

PRETTY BUT PUGNACIOUS

by Barry Durham

ONE OR TWO of the more unusual livebearers seem to have found their way into the shops in recent months, but the very fact that they are unusual has led to confusion because all too often the shopkeepers know very little about their new charges. A case in point locally has been the introduction of so called "Two-spot livebearers." True, they have two spots, one small one behind the gill cover, and one large one on the caudal peduncle, but they are not the diminutive creatures to which the popular name more usually applies.

The shopkeeper was not even sure of the scientific name and when he described them as "Two Spots" it was certainly not the one I was expecting. However, it was close enough for me to correctly identify the fish—eventually.

Having more than a passing interest in all species of livebearing fish I bought a young pair and put them in our 48 in. × 18 in. × 12 in. community tank to settle down along with several other species of livebearers, an angel and a couple of three spot gouramis.

I had heard, and had read, that the "Two Spot" was a peaceful, pretty little fish rather like a small wild guppy, but knew very little else about it. This pair, however, although very attractive, did not fit the

description, but my curiosity had got the better of me. They were, I discovered, not the *Poecilia parae* I had vainly hoped they would be, but *Heterandria bimaculata*—a fish which was in vogue many years ago when anything that was a livebearer was popular, but which has been superseded by better tempered fish. Indeed, the female usually vents her anger on the male, which is about half the size that she is.

The specimens I obtained seemed to have been aquarium bred because they are quite beautiful in colouration and differ considerably from the rather drab descriptions of the wild fish. They are rather slimmer and longer than the commoner livebearers and the female is slightly the prettier of the two for a change, although the basic body and fin colour of both sexes is almost the same. The body is a pale, almost mother-of-pearl, shade of mauve which blends into pale blue and then white under the belly. The scales are edged in black giving the fish a netted appearance. The eyes are dark blue-green and there are patches of iridescent green about the underside of the head and extending over, and a little beyond, the gill-covers.

The female's gravid spot is not large and the spots which give the fish both its "popular" and Latin

name (*bimaculata*) are situated on the caudal peduncle and just behind the gill-cover. The one close to the caudal fin is large and black, fading to grey on the lower half of the body. The second, close to the gills, is quite small and black, but may even be missing altogether on some specimens, especially males.

The dorsal fin of both male and female is bright yellow with two black zig-zag stripes close to its base; it is quite long but not very high, being slightly bigger in proportion on the male.

There is a faint green stripe at the base of the caudal fin which also extends along the bottom three or four rays and the pelvic fins are also pale green. The female's anal fin is translucent rather than transparent with the rays picked out in dark grey. The pectoral fins are colourless.

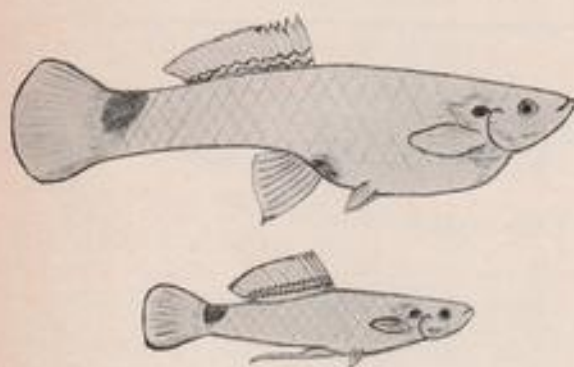
The male is very similar although the green iridescence is less pronounced and the pelvic fins are colourless. The gonopodium is quite long, reaching

fish smaller than themselves, although they do seem to confine their pugnaciousness to the fins and especially the tail.

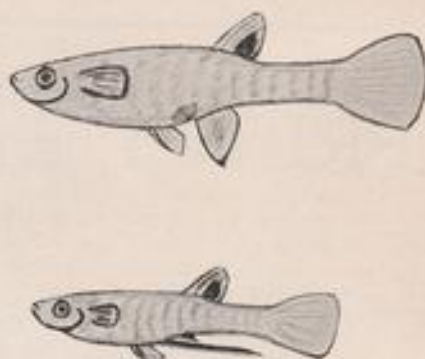
In a tank where all the fish are about the same size or larger, or will fight back like Tiger Barbs, there does not seem to be any trouble whatsoever. In fact, having stuck to the rule of not introducing any fish smaller than the female, we have not had a single casualty after the first few days.

What has also helped is the fact that the "cock" of our tank is a home-bred green male sailfin mollie who soon put our two "Two Spots" in their place when they tried to have a go at his tail. Indeed, after a few abortive attempts to nip the "feelers" of a rather large angel fish which also inhabits the tank, they have even given up on that and now confine their chasing and nipping to themselves, but with plenty of plants in the tank they don't manage to do much damage to each other either.

The species breeds quite prolifically and the female



Heterandria bimaculata, female above.



Poecilia parae, female above.

half way to the caudal fin and has a tiny hook on the end. He is very much slimmer than the female.

Both have an almost pike-like appearance and the female spends a lot of her time lurking near the surface of the water waiting for food. The male is more active, making frequent excursions all over the tank. At other times the stations himself about six inches behind the female with all fins quivering and then makes a sudden dart and thrusts his gonopodium towards her vent. If she spots him she will turn and chase him swiftly away and then resume her station near the surface.

There is no mistake that this species can be fin-nippers and on no account should they be put in a tank with veiltail guppies or other fish with flowing fins such as Siamese fighters. They don't bother the other fish much when the tank lights are on, preferring to go into battle at night when no-one can see just what they are up to. They will attack any

may produce a brood of anything up to 100 young after a pregnancy of four to six weeks. (If she lets the male get near her, that is!) The fry are about half an inch long at birth and begin to colour up in a week to ten days. They are always hungry and relish sifted *daphnia* and finely chopped *tubifex* worms at two to three weeks old. They grow rapidly and are mature at about six months. The breeding tank should be densely planted as the mother will readily eat her offspring and even when she has been removed the young fish can be quite boisterous amongst themselves.

The male grows to about 1½ in. and the female about 3½ in. and as I said, providing they are kept with fish a little larger than themselves, or there are no flowing fins or tails about to tempt them, they are no more vicious than Tiger Barbs and can make a handsome addition to the range of available live-bearers.

Head-on view
showing characteristic
high, domed "forehead."



AN UNWANTED SPAWNING OF *Cichlasoma citrinellum*

by Richard Dunleavy

THIS South American species is one of the giants of the cichlid world; a fully grown specimen can make the oscar look small in comparison, and it certainly lives up to its common name of red devil as far as temperament goes, but as for the prefix red, I have never seen a red *C. citrinellum* although there is a school of thought that *C. citrinellum* goes through three or four colour changes eventually ending up red. I personally do not subscribe to this theory and I believe some people may be misled by seeing the various colour plates in books simply stating red devil. To my knowledge the only red devil with red coloration is *C. erythraeum*, but then again there is very little information on the red devils in any of the aquatic literature I have seen, so I can only speak with any certainty on the ones I have kept and bred, i.e.

C. citrinellum. I spawned these fish some two to three years ago and my reason for writing this article such a long time after the actual spawning is due to the fact that I mislaid my notebook which contained the details of the spawning. I have only just found this book again, jammed down behind a tank in my fish house.

When I purchased these fish they bore no resemblance to the adult fish in coloration but were a dirty grey colour with a number of black bands on the body. By the time they were three and a half inches long they began to take on the adult coloration and during this process they looked even more unsightly being a dirty white with black blotches. Fortunately this does not last long and they were soon a lovely lemon-yellow. The fin development of this species is fantastic,

especially the anal and dorsal fins which extend to the caudal fin and beyond. This is the case with both male and female so this is no way to sex this species. In my experience the only reliable sex distinction is in the shape of the genital papillae during the breeding season, that of the male being slender and pointed while the female's is thick and round.

As I mentioned earlier, this species lives up to part of its name as far as temperament goes as they really are devils; I can truthfully say this is the most vicious cichlid I have ever kept and I have kept a lot. They just would not tolerate other cichlids in their tank. I tried all the dodges like changing the tank furnishings around to confuse them, adding more and more fish to the tank to try and dissuade them from being so territorial, but it did not work. As far as my pair was concerned the whole tank was their territory and they intended to keep it that way. The pair was eventually housed in a four foot tank by themselves and almost exclusively fed on earth worms. The fish at this time were some eight inches long and although they were intolerant of other cichlids, they behaved quite well towards each other, which made me think they might be a pair. However, I was not interested in breeding at the time as I did not have the facilities for this, having only three tanks available. My intention was to feed them up and try my hand at showing them.

The pair remained on their own until some two months later my third tank burst and I was left extremely short of space so I decided to try housing some large non-cichlids with my *citrinellum*. Having found to my cost how much damage the red devils could do in a short space of time, I approached this task with some trepidation and removed all the tank furnishings, siphoned off one half of the water and topped up with water straight from the tap. I then replaced the rocks, petrified wood, etc., being careful to arrange them in an entirely different pattern to that of the previous set up, the idea being that the red devils would be so busy trying to re-establish their favourite resting places and swim-patterns that they would not have time to notice their new neighbours. This seemed to work, as when I introduced the new inmates they were completely ignored; of course this may have been because they were non-cichlids. The fish introduced were: one fifteen-inch snakehead, one ten-inch *Osporonemus* gourami, and one sixteen-inch *Clarias* catfish. The temperature was raised from 76 to 80°F. as this was the temperature the non-cichlids were used to.

The combination of raised temperature and fresh water seemed to trigger off the spawning instinct of the *citrinellum* as they spawned some two or three days later. I feel I should point out here that I can take no credit whatsoever for this first spawning; in fact at the time of spawning I was in bed with a chest infection and taking no interest in my fish at all, hence the reason for not knowing the exact day the fish spawned.

Exactly four days after the changeover I was on my feet again and anxious to see how this mixture of species had got along together. Imagine my surprise when, on entering the shed in which the tanks were housed, I found that not only had the fish settled down well, but that my *citrinellum* had actually spawned. The first thing I noticed was a huge mound of gravel in a half circle which screened off the back right hand corner of the tank. Behind this were my *citrinellum* guarding their eggs. The spawning site was two round flat rocks which I had forgotten were in the tank. Both rocks were covered with eggs and the pair were guarding one batch each. The other fish did not seem to take any notice of the pair, and on the odd occasion when they did swim towards the spawning site they were quickly turned away by one or other of the pair. The next day the eggs were gone and the *citrinellum* were swimming around quite unconcerned so I presume they ate the eggs themselves.

I had never heard of cichlids spawning on two separate rocks and guarding one each, so I mentioned this (to me unique) event to my local dealer. The only suggestion he could put forward was that maybe my fish were both females and they had spawned on separate rocks. I was rather sceptical as to the correctness of this suggestion so I decided that I would try and induce the fish to spawn again and see what happened.

A week later I had my burst tank repaired and decided to use it for the spawning attempt. I half filled this tank with water from the four foot tank and topped it up with tap water. I then furnished the tank with petrified wood and the two round rocks. These I located in the same corner as they had been in the four foot tank, buried under the gravel. The temperature was 80°F. and the pH 7.2. The pair were then transferred to this tank where they settled in quickly. I stopped feeding them garden worms and fed them only flake food for two weeks. On the third week I again started feeding them worms and replaced one third of the water with tap water which lowered the pH to 7. Four days later the fish spawned and once again both rocks were used with each fish guarding one rock. They did change places occasionally, and at feeding time both of them would leave the eggs to feed and then resume guard-duty.

The eggs hatched in three days time and the fry were free-swimming after a further four days, thus proving that my dealer's suggestion was incorrect. The pair proved to be good parents and were left with the fry for exactly one month before being transferred back into the four foot tank along with the two rocks. I had a number of subsequent spawnings from this pair and each one was a carbon copy of the first.

When the fry were three months old I began casting around for ways of disposing of them but nobody wanted to know, so they ended up as food for my snakehead and *clarias* catfish.



OUR EXPERTS' ANSWERS TO YOUR QUERIES

READERS' SERVICE

All queries MUST be accompanied by a stamped addressed envelope.

Letters should be addressed to Readers' Service, The Aquarist & Pondkeeper, The Butts, Brentford, Middlesex, TW8 8BN.

TROPICAL QUERIES

Please give me some information on a catfish sold to me as *Corydoras bondi*? I cannot find this species mentioned in any of the aquarium books I own or have come across in shops.

C. bondi is one of the rarer species of the family *Callichthyidae*. It is found in Venezuela and attains a length of 2 in. It is basically olivaceous in hue, with a blackish or black stripe that extends from behind the gill-cover to the root of the tail. Black spots cover most of the back and certainly spread onto the upper sides and over the head. A temperature in the middle to upper seventies (°F) and all the regular dried and live foods suit this fish well.



Corydoras bondi

I recently purchased two fish called *Julidochromis marlieri*. Can you tell me whether this fish is a livebearer or an egglayer? Also, where is it found in the wild and what kind of conditions does it need in captivity? Finally, will my two fish fit into the easy-going atmosphere of my community aquarium?

J. marlieri is an egg-laying species of cichlid from Lake Tanganyika. It should really be kept in a tank on its own or with other African cichlids suited to living with it in a specialised environment. That is to say, hard and alkaline water in a spacious tank carpeted with a thickish layer of well-washed sand or

by Jack Hems

fine grit broken into shelter zones with piled slabs of slate, sandstone or granite, for the male tends to bully his mate and without adequate shelter she would almost certainly have a very unhappy and, perhaps, short life. Temperature is best kept in the upper seventies (°F). Food given should consist of small white or red worms, swallowable crustaceans, gnat larvae, and so on. *J. marlieri* grows to a length of about 4 in. It is strikingly marked and is worth every effort to keep and breed.



Julidochromis marlieri

I have been keeping tropicals for about ten years with little or no trouble at all. Recently, however, I moved into a newly erected house and from the start have experienced too many losses in my 4 ft. community tank for my peace of mind. In short, almost all the fishes I have introduced over the last six months have died without any external signs of disease. Moreover, the plants refuse to prosper even though the lighting is right (according to reliable reference books) and the temperature is maintained at the normal range. Have you any idea what is wrong?

I hazard the guess that the water in your tank is not, at the present time, suited to plants or fish. The new pipes in your domestic water system are probably dissolving out substances harmful to fishes and plants.

THE AQUARIST

(After long use water pipes become coated with various mineral deposits that seal in toxic matter.) It follows, therefore, that the mains water should be run for a few minutes before using any of it in your aquarium. Better still, boil it before use. Alternatively, try and save as much clean rain water as you can in plastic bowls or buckets stood outdoors some ten minutes after it has started to rain. The initial rainfall clears the atmosphere of a lot of its impurities.

I am searching around for black-banded sunfish. In the event of my finding some for sale, I should appreciate details of the environment and food best suited to their requirements.

Soft peaty water planted with *Vesicularia dubyana* or *Microsorium pteropus* tied with nylon thread to well-soaked cork bark or bogwood and a temperature in the upper sixties to lower seventies (°F). Next, live food such as gnat larvae, white worms, bloodworms and tiny crustaceans. Finally, little disturbance, for the black-banded sunfish flourishes best in peace and quiet.



Black-banded Sunfish
(*Mesogonistius chaetodon*)

Could you please give me any information on my silver dollar fish?

If you can supply me with the scientific name of your fish, I will be happy to oblige. Unfortunately, the popular name of silver dollar fish has been given to two or three species of characin and I have even seen it applied to the marine and brackish water fish known to science as *Monodactylus argenteus*.

I am being driven to financial ruin by two *Cichlasoma severum* and two tinfoil barbs (*Barbus schwanenfeldi*). They eat their way through every expensive collection of plants I buy from various dealers. Can you recommend any plant that the above fish would leave alone?

You should have found out something about the habits of your fish before you purchased them. The tinfoil barb is a plant eater by nature and, in the aquarium, requires plenty of greenstuff in its diet. Small *C. severum* are not hard on plants but as they increase in size they unfailingly develop the habit of

pulling them out of the compost and chewing at them. Plants that grow free-floating at the surface last the longest and, indeed, sometimes spread well enough to make a thick carpet. I suggest a few bunches of a warmwater hornwort (*Ceratophyllum*), a warmwater grown (*Elodea densa* or, if the top light is really bright but not dry and scorching, the floating fern (*Ceratopteris cornuta*). You should be able to keep the tinfoil barbs fairly well satisfied (gastronomically speaking) if you include scalded lettuce leaves, cooked spinach or cooked nettle tops or turnip tops in their diet.

Please I should like the following information on *Rasbora trilineata*: maximum length, general attitude towards other fishes sharing its tank, life-span and the most suitable food.

In the natural state in Malaysia and Indonesia *R. trilineata* is said to reach 6 in. It is not often, however, that the aquarist comes across a fish more than about 3 in. It is a good community fish and lives at peace with fishes larger than guppy fry. Ordinarily it has a life-span of upwards of four years. It takes any live food, finely shredded lean meat and the usual dried foods.



Rasbora trilineata

I have a large sucking loach in my community tank which has suddenly developed the habit of channelling grooves in the compost and burrowing under stones. When it is not engaged in these occupations it shows every sign of wishing to get out of the aquarium. In other words, it keeps rushing to the surface in order to leap above water level. Do you think the fish is suffering from some disease?

It is not uncommon for a large *Gyrinocheilus aymonieri* (I think this is the fish you have) to make furrows in the compost or make shelter places between or under stones. As for its apparent intention to leave its natural environment, this, too, is typical of some loaches and loach-like fishes at different times. Provided your fish looks in good shape and shows no external signs of disease do not worry about its behaviour. Always, however, keep its aquarium well-covered to prevent its escape and likely death on your floor.

Soon after cleaning with a scraper, the glass sides of my aquarium always develop a dark

brown growth. The tank is 4 ft. in length and is illuminated for about 12 hours a day with four 25-watt tungsten lamps. There are rocks for the fish to shelter behind and plastic plants which have to be scrubbed clean at frequent intervals. What steps should I take to get rid of this brown growth?

Remove the 25-watt lamps and replace them with four 40-watt clear or frosted or pearl glass lamps. Better still, install a 40-watt fluorescent lamp (warm-white or the more expensive True-Lite). A brown growth is synonymous with poor or inadequate lighting. Unless you keep plant-eating fishes, it would be a good plan to set up the tank with plenty of genuine aquarium plants and keep the light switched on for about 14 hours a day.

I am becoming increasingly interested in sharks and loaches and would like to keep a community of different species or breed different species in specially set up tanks. Where do you think I should go for the necessary information?

Buy a copy of *Sharks and Loaches* by Braz Walker (TFH Publications). This well-written and well-illustrated book will give you a great deal of information on a great number of well-known and little-known species. You will not, however, find much on breeding, for very few sharks or loaches have bred in captivity, that is up to the present time.

My white plastic-coated metal tank has developed cracks on the top angle bars. What should I do to prevent water getting in and worsening the condition?

Dry the surface well and then smooth over the cracks with a silicone rubber aquarium sealant. After this has set, paint over the flat surface with two thin coats of polyurethane paint.

I have recently acquired a 36 in. x 15 in. x 12 in. tank and wish to stock it with coldwater

and tropical fish. At the time of writing, I have another tank of identical measurements stocked with one koi carp, one common carp, and one shubunkin. I am keeping this tank at a temperature of about 68° F (20° C) to 72° F (22° C).

Before you go any further in fishkeeping, I strongly suggest that you read a few of the better booklets and books on aquarium management. Koi and common carp soon outgrow a 3 ft. tank and demand swimming space in a roomy outdoor pond. Further, coldwater fish such as koi, common carp and shubunkins do not require a water temperature in the upper sixties (°F). If you are overwintering the fish prior to putting them in a pond in late spring, that is when the water has warmed up, then comfortable room temperature is about the limit. A temperature in the upper fifties or low sixties (°F) would be better. Then again, it is not a good plan to keep coldwater fish and tropical fish together, though a few tropicals are hardy enough to stand a fairly low temperature and some coldwater fish will appear to be quite comfortable at a rather high temperature, that is for coldwater species. However, only the very experienced aquarist knows which coldwater and which tropical species can live together. One great difficulty is that coldwater fish demand a lot of oxygen and the warmer the water the more oxygen they require. If you cannot find good books on aquarium keeping in your public library or bookshops, then I suggest you have a chat with a reputable dealer in aquarium fishes in your locality.

What is a bladder snail?

The native bladder snail is known to science as *Physa fontinalis* and its thin oval shell is only about half an inch tall at full size. It is a species that settles down well in a tropical tank and from then on becomes a pest for it multiplies rapidly and feeds on the green leaves of plants. It is, indeed, a much heavier consumer of plant life than the ordinary brown planorbis snail beloved by old-time aquarists.

GOLDWATER QUERIES

by Arthur Boarder

I have a large valuable Koi carp in my pond and notice that it has a small tuft of greenish fur-like substance on its side. What cure do you advise?

The tuft is Fungus disease and it is green because of the presence of free-floating algae in the pond which is staining the fungus. As the fish is otherwise healthy there is no need to treat the fish with a sea-salt bath, as usually recommended. The spot can be painted with an antiseptic such as Dettol, T.C.P. or Gentian

Violet. The fish can then be returned to the pond and one or two treatments should cure the disease. The fish may have received slight damage by a pest or a knock which removed some of the protective mucus covering. This allowed the spores of *Saprolegnia* (fungus disease) to enter.

I wish to breed Shubunkins and would like to know where I can get a good pair? Also I want to make some hatching tanks but the price of

glass is so prohibitive that I would appreciate any alternatives you can offer?

I too am bewildered by the present prices of so many items. I envy the youngsters who do not remember the good days before the 1914-1918 war. I was nineteen when the war broke out and so had enjoyed the good times when I could visit a music hall and have my supper out for 6d (2½p). A seat in the upper circle and a programme 4d., fish and chips 1d. and a tram ride home, 1d.

However, there is no need to spend a lot of money on glass tanks for your purpose. I have used several cold water cisterns floated over with a cement and sand wash and have made a dozen concrete tanks, each 24 × 12 × 9 inches. Also you could use plastic washing-up bowls and baby's baths. As a matter of fact these are much better than glass tanks for hatching and rearing fry as clear-sided containers are not natural and a top light is sufficient.

I am enclosing an address where you can get the fish you require.

I have a community tank of coldwater fishes and recently noticed that a fantail had some blackening on the tips of its caudal fin. This black seems to be increasing somewhat. The fish is otherwise quite healthy and I have put it by itself. Is there any treatment I can give it?

I think that you can leave well alone and do not think that there was any need to separate the fish. There seems to have been some damage to the part perhaps by fin-rot or fungus and the trouble has cleared up. Where there was some damage the injured part is making fresh growth. In goldfish, this is usually black but should soon clear away. There is nothing needed in the way of treatment.

For three years I have been trying to breed veiltails and orandas, using a two-foot tank for a pair of 3-in. fish. I feed them on a good flake food and blood-worms. After a time their scales stand out and they eventually die. Is this dropsy and if so what am I doing wrong?

When the scales stand out from a fish it is a sure sign that something is wrong and if the fish becomes swollen in the body, it is fairly certain that dropsy is the trouble. Once a fish is badly affected it is almost impossible to cure it and I doubt very much if a permanent cure is possible. The only thing I can think of which may have brought in the disease is the feeding with blood-worms. I know that many aquarists use these with no apparent harm to their fishes but as these worms usually come from a filthy bottom of pond or river, it may be that the bacteria causing the trouble was present on them. I suggest that you cut out the blood-worms and see if there is any improvement. It is thought by some experts that the disease is caused by a virus but others favour

bacterium, but as both have been found in infected fishes it is not certain which is the main cause. Most aquarists will be familiar with the illustration in some books of a fish with dropsy being treated by the insertion of a hypodermic syringe into it to remove the liquid. I dread to think of an inexperienced person shoving a needle into the body of a fish. And even if liquid is removed, this does not signify that the germs responsible have been removed also.

In any case, even if a fish could be cured I would not think of using it for breeding purposes as only the very healthiest fishes should be used for this purpose.

What is a feeding ring and is one necessary in a tank?

I suppose that it would be better to call them food holders as some are square in shape. They are made from glass or plastic tubing and are about two inches across. I consider that one is absolutely essential in a set-up tank. When dried food is dropped on the top of the water it immediately spreads out all over the surface. The food can then fall down among the water plants and some may not be eaten by the fishes. This could cause pollution. If one is placed in one of the front corners it will usually stay there. It should be turned over each day so that any fine food left on it can be cleaned off before it turns foul.

Can you please tell me something about Lionheads? How big will they grow in a four-foot tank and when will they develop a hood? I have been told they will never do so in a tank. Is this correct?

A Lionhead could grow to about three inches in body length with plenty of space and the right foods. However, one does not usually see them much over two inches in body length. I see no reason why a fish should not form a hood when kept in a tank, providing it is of a suitable size for the fish. As for the time taken to form a hood! This is like asking "how long is a piece of string?" So much depends on several circumstances. In a good strain of Lionheads, the young should form a hood within two years. Even in such a strain it is possible for some to fail to form one in several years. Some may only have a small excrescence on the top of the head instead of a complete hood covering the head and the whole of the gill-plates.

There is no doubt in my mind that the temperature of the water for rearing plays a very important part in the rate of growth and development. I consider that the best temperature for rearing fancy goldfish is in the middle seventies (F). At this range the fish grow and develop very well. At a lower temperature the rate of growth is slowed down and at too high a temperature the fish do not seem to do as well. At over 80°F, they rush about and if they do not get

Continued on page 14

ARTIFICIAL INCUBATION OF MOUTHBROODER EGGS

by Jorgen & Pamela Hansen

WHEN ONE KEEPS mouthbrooding cichlids one will invariably discover some swimming around with eggs in the mouth. However, disappointment is often in store: the parent may reject the eggs, or consume them.

If one is determined upon propagating one's specimens with or without parental aid, one can attempt to incubate the eggs artificially. This, moreover, often gives larger broods than when the parents take charge. We have noticed that the parents, seemingly taking account of the space available, limit the number of fry accordingly by devouring those they deem to be in excess.

We have incubated cichlid eggs artificially upon several occasions, partly to ensure that offspring were obtained when parental care was lacking, partly to obtain information with regard to the length of the incubation period of the various species at various temperatures, and partly to study the eggs' development. Mouthbrooder eggs are as a rule large and thin-shelled and should be treated with caution. A general rule when attempting to incubate these eggs is to try to imitate nature as far as possible. With this in mind, one should ensure that during the process the eggs lie in darkness, that they are circulated regularly (as by the mother's chewing-like activities), and that fungused eggs are removed.

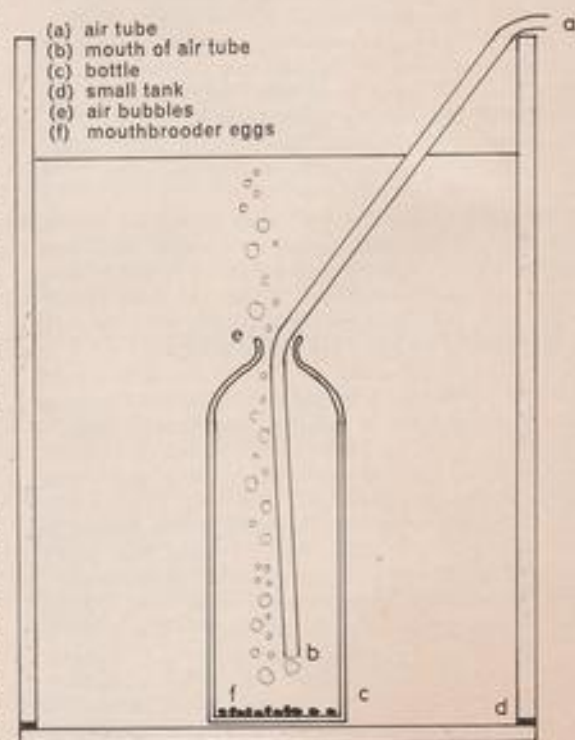
Incubation apparatus

In order to enclose the eggs and eventual fry in a limited space, as in nature, we place them in some water in a small bottle measuring about 3-5 cm. in diameter and about 12 cm. in height. The bottle is narrowed at the top, the mouth having a diameter of about 2 cm. We place the bottle in a completely bare and clean tank measuring 20 x 20 x 30 cm., and fill the latter with about 8 litres of water, giving a water level of about 20 cm. We always use water taken directly from the tap (DH 14, pH 7), as it is the

cleanest. It contains a little chlorine but this soon disappears with aeration.

An air tube without diffuser stone is placed in the bottle such that the mouth of the tube is situated about 3 cm. above the eggs. The air stream is then regulated so that irregular bubbles are produced. This

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Embryo development in *Pseudotropheus auratus*.
 Figure 1: One day old. Length about 3mm. and width about 2mm. Colour orange/yellow.
 Figure 2: Four days old. A faint line can be distinguished along its length.
 Figure 3: Five days old. One can see two distinct dark spots.
 Figure 4: Six days old. A small head and tail have developed.
 Figure 5: Seven days old. One can now see the eyes.
 Figure 6: Eight days old. One can see the blood vessels on the yolk sac.
 Figure 7: Twelve days old. One can vaguely see the black longitudinal stripes and the yellow body. The fish is able to swim in small jerking movements.

Figure 8: 13 days old. It seems to stand on the remnants of the yolk sac.
 Figure 9: 19 days old. Only a little of the yolk sac left. Otherwise seems fully developed.

INCUBATION OF MOUTHBROODER EGGS *Continued from page 12*

results in a regular circulation of water in the bottle. Each time an extra stream of water occurs, the eggs turn around once and perhaps rise a couple of millimetres in the water; however, as they are heavier than water, they sink to the bottom again.

If an egg is affected by fungus, it turns white and becomes slightly lighter in weight although still heavier than water. This weight loss is, however, enough to cause the fungused eggs, with the extra water movement, to rise a couple of centimetres; they are then whirled along with the air bubbles out of the bottle into the tank, where they can easily be removed with a pipette.

When the infant fry are able to wriggle up into the stream of air and water, they are also whirled from the bottle into the tank. They should not, however, be fed until free-swimming, and the tank should be covered with a dark cloth until then.

On an experimental basis, we have tried to incubate *Pseudotropheus williamsii* eggs in an uncovered and therefore light tank with a bottom area of 400 sq. cm. Only a very few survived and these were so deformed that we destroyed them immediately. On the other hand, most of a batch of *Pseudotropheus auratus* eggs survived when incubated at the same temperature but in the afore-described manner in a small bottle and in darkness. It seems that where there is light and an excess of space, the fry will begin to wriggle wildly round on the tank bottom at the slightest disturbance, just as soon as eye pigmentation is formed; this is perhaps detrimental to their development.

We have had the opportunity to incubate some 15 eggs spat out by a *P. auratus* female in the course of being transported from one tank to another in a small container immediately after spawning. As the female still had some eggs left in the mouth, we left her by herself in the prepared tank. The temperature both in her tank and in the one containing the rejected eggs remained constant at 26°C. On the 19th day the artificially incubated young were fully developed and swam freely. These were then fed with brine shrimp. The mother, on the other hand, did not release her remaining fry until the 23rd day. These eight fry were somewhat smaller than the twelve artificially incubated, which can no doubt be accounted for by the latter's having been fed for four days.

There has been some speculation as to whether there is any connection between artificial incubation of cichlid eggs and lack of normal parental function in the adult fish, the theory being that if this latter ability is acquired, artificially bred fish will be found lacking, not being able to pass on what they have not themselves experienced. With this theory in mind, we carefully observed the course of events when three of the artificially incubated *P. auratus* females at the age of 10 months were found to be carrying eggs in the mouth. Each female was placed in a separate tank; each released a batch of fry 22 days later. It thus seems as though the fact of a fish having been artificially incubated does not interfere with its capacity for mouthbrooding.

COLDWATER QUERIES *Continued from page 11*

sufficient food they grow more slowly and do not seem to do as well, maybe because there is less oxygen in the warmer water. However, it is not only the hood which may determine the quality of a Lionhead. As most fanciers know, the fish has no dorsal fin but many otherwise good specimens are spoilt by an uneven back formation. Where the fin should be in a normal goldfish, there is a small bump or two which spoils the even contour of the back. It must be realised that just because one is using a perfect pair of fish for breeding, it does not signify that all the youngsters will be equally good.

There is one point I would like to make as regards the warm water for rearing fancy goldfish. I have found that some Moors are inclined to lose some of their sooty blackness when kept at too high a temperature.

We run a commercial nursery and wonder if it would be a good idea to go in for water

gardening to sell water plants and fishes? Are there any books on growing water plants on a commercial scale and also keeping and breeding fishes?

It is not easy to advise anyone about starting a commercial water garden these days. First of all I suggest that you get a copy of the *Aquarist & Pondkeeper* to see how many such gardens are in your area. As you have a going concern with other plants, I suggest that you make a quiet start with water plants and fishes so that you can gradually build up the business. With water plants, once you have a stock it is not difficult to increase the stock by cuttings and divisions. You can go steady and remember the old Chinese saying, "Softly walkie catchee monkey."

Get the book "Water Gardening" by Frances Perry, published by London Country Life Ltd., and my book, "Coldwater Fishkeeping" published by Buckley Press. You will find all the information you need in these books.

ANGELS

by W. Murray

There are only four wild caught species of Angel fish.

Pterophyllum altum. A native of the Orinoco river in Venezuela. It is a brownish gold colour and in dimension is deeper than it is in length.

P. dumerilii. A native of the Essequibo river, Guyana. It ranges south right to the Amazon basin. This species is not very popular with aquarists, as it has very poor finnage which it holds right back. It also has an oddly shaped mouth which is pointed like a beak. It is a true species which was included in the *Pterophyllum* genus in 1840. Originally called *Plataxoides dumerilii*.

P. scalare and *P. eimekei*. Habitat: the Amazon Rivers in Brazil. I include the name *P. eimekei*, as this name is widely used in books and articles on aquaria. It is only a synonym of *P. scalare* and therefore invalid.

All other Angel fish must be varieties *Pterophyllum* species stemming from changes made by man.

Contrary to the beliefs held by beginners to the hobby, there is no magic needed in breeding tropical fish; if there were the magic formula would consist of four ingredients, namely: a breeding pair of fish, common sense, patience, and a little knowledge of the fish to be spawned. Over the years of breeding tropical egg-layers the question which is asked most is, what are the easiest egg-layers to breed? The reply is, without hesitation, the Angel fish, (*Pterophyllum eimekei*).

These stately, proud fish come from South America, and range through Guyana, Ecuador, Peru and, of course, the Amazon basin. They are always found in slow-moving streams and rivers and never in the middle of such water courses as only close to the banks, where reed-like plants grow profusely, do they feel safe.

Now that we know their environment, a tank can be set up. The fish like it well planted and their shape is well adapted for swimming between the plants. Decomposing plants would make the water acid in the wild but the movement of the river would filter and carry off most of the acidity leaving the water only slightly acid.

The water is clear and with a slightly higher temperature than the main stream, which according to an author who lives in Santarem, and is noted for his accuracy, is approximately 75°F. throughout the year so the breeding tank will be kept at 80°F. and a pH. of 6.8.

The methods of sexing Angel fish are many and varied (some very unreliable). There are only three ways I could recommend. Comparing ovipositor tubes (when the ovipositor tubes are down this is usually a sign that the fish are ready to spawn). Buying a breeding pair from a reliable person or purchasing six small Angels and allowing them to grow and pair off naturally. The last method is the best.

Pairing off usually starts by the fish spreading their fins and making darting movements towards each other. There will probably also be some mouth pulling, in the usual cichlid manner. The pair, once through these manoeuvres, will swim side by side away from their companions, chasing away any fish which tries to follow. A breeding pair, once established, should never be separated, as they usually pair up for life.

Angels start breeding at eight months to a year, the best breeders being about a year old and approx. six inches high. Giving them plenty of live feeding will keep the fish in good condition.

Now we have a breeding pair we can start our programme. Put the pair in a 24 in. x 12 in. x 12 in. tank, which has been set up to as near their natural habitat conditions as possible, i.e. with the sides and back planted with *cabomba*, wistaria, etc., any small leaved plants. This deters the fish from spawning on them, or on the glass. Dorset peas or well washed gravel should cover the bottom. The water should be soft and slightly acid, temperature 80°F. Against the side of the tank is placed a piece of slate approx. ten inches long and 2 inches broad sloped at an angle of about 60°. Once the pair choose the site, they will clean it scrupulously, by picking all pieces of foreign matter from the slate. The female starts by swimming up the slate two or three times, her ovipositor tube touching it (a sort of dummy run



Pterophyllum altum



P. dumerilli



P. scalare

before she actually starts spawning). If everything is to her satisfaction, she moves up the slate again depositing a row of eggs and as she reaches the top of the run the male follows on the same line, fertilizing the eggs. When the operation is over there are about 300-400 eggs deposited on the slate in neat rows, no egg touching another. If the eggs are left with the parent fish they will take it in turn to fan them with their pectoral fins and back edge of their anal and dorsal fins. This causes a current of water to pass over the eggs, washing away any foreign substance that has landed on them. The parents stop every so often to pick any matter from the eggs, which their fanning has failed to dislodge.

This fanning continues for 3-4 days. When the eggs hatch they are still attached to the spawning site by a thin membrane to their heads. Most of the fry have made exploratory journeys by the sixth day, and can be seen in clumps or sticking to the glass etc. The parents during this time are taking them in their mouths and spitting them back onto the slate to which they adhere. When hatching the spawning artificially, remove the slate immediately after the fish have spawned and place it in a receptacle previously set up with water from the spawning tank to which a few drops of methylene blue, or acriflavine have been added. It is important that temperature in both tanks is the same and that the eggs are under the surface, for a depth of at least two inches. Place an air-stone under the eggs so that the air bubbles pass over but do not touch the eggs. This causes a current of water to pass over the eggs in much the same way as the parents' fanning motion. The day after transferring the eggs to the hatching receptacle, start removing approx. half of the water, replacing

it with clear untreated water of the same temperature until the fry are free swimming by which time the water will be clear. A foam filter can then be used in place of the air-stone, this type of filter being quite safe for the fry. Start feeding the fry on newly hatched brine shrimp, which should be started when the Angel eggs hatch and the first feeding given when the fry start free swimming, as they will have been nourished by their yolk sac until then. After the first week mix the feeding by adding baby fish food, wetting it before putting in the tank. Then feed, progressively, sifted *daphnia*, crushed dried flake food, etc.

NOT A VERY GOOD MIXER by Hilary Maynard

My first is in BORROWED but not in BLUE,
My second is on COLOUR but not in HUE.
My third is in RAT and also in RACE,
My fourth is in FLANNEL but not in FACE.
My fifth is in NUTMUG but not in SPICE,
My sixth is in ATTRACTIVE and also in NICE.
My seventh is in CUSTOMER but not in SALE,
My eighth is in CHAUVINISM but not in MALE.
My ninth is in JOY-RIDE, and also in TRIP,
My tenth is in OPPOSITE but not in FLIP.
My eleventh is in MAJESTY but not in QUEEN,
My twelfth is in ENTHUSIASTIC but not in KBEN.
My thirteenth is in SHEPHERD and also in FOLD,
My fourteenth is in FEARLESS but not in BOLD.
My whole is a loner, inclined to be shy!
But well worth the money,—so why don't you try?

ANSWER ON PAGE 22

WHAT IS YOUR OPINION?

by B. Whiteside, B.A., A.C.P.

Photographs by the Author



MR. MURRAY WINTERS is 15 years old and lives at 'Forth,' Bankhead Lane, Hoghton, Preston, Lancs. He has been keeping tropical fish for about two years and writes: "I have very unsympathetic parents when it comes to my aquatic activities. I have to finance all my fish-keeping and breeding projects. Luckily I have a holiday job working for my friend's father. This just about takes care of my present needs but unfortunately I am very enthusiastic and ambitious and for a long time I have thought of building a very modest fish house in the back garden. Although I have access to two large libraries and have scanned all the fish books in both from cover to cover I have been unable to glean any but the scantiest information about the building or running of a fish house.

"I have several questions I would like to ask and would be very gratified if you or anyone else for that matter would be kind enough to answer them for me. 1. What are the best materials for building a small fish house and what would be the smallest feasible size? 2. Could a fish house of the nature mentioned above be self-supporting after deduction of the initial cost of building and stocking; and if not how much, on average, would one have to take out of one's pocket? 3. What would be the best method of heating this fish house and would one heat individual tanks or the place as a whole? If space-heating is recommended what would have to be the air temperature to keep the tanks at a tropical heat? 4. Would one be well advised to breed a wide range of very popular fish or would it be more advisable to concentrate on a few fairly expensive fish? I am now thinking specifically of the dwarf cichlids as I have had fair success up to now breeding them with my present facilities. Also, if I were to breed dwarfs do you by any chance know where I might get some species other than Rams and Agassizi? 5. Finally, is there any particular design that you think might suit my needs? I hope that I have addressed my letter to the right person to deal with my particular queries. If not, could you please pass it on to someone who can help me out of this rather stationary period in my fish-keeping career?

"Although you have probably heard or read these next few words many times, may I take this opportunity to thank you for an extremely good and

informative piece of a great magazine. I see that a letter of mine was printed in the August 1976 edition; it was about my way of culturing micro worms. Unfortunately after receiving that edition I had a disagreement with my local newsagent over my order for your magazine. As I have no recent edition of it and am missing it very much could you please enclose with your reply the current subscription rate? As they say around here, 'Murky Buckets.' One last point: I should be very pleased to hear from anyone who has tried out my method and of the results they have obtained." (Thank you for your kind comments. Unfortunately I have never been able to afford a fish-house and, hence, I have no personal information to impart; however, no doubt many readers of this feature will send their opinions and these I will publish at a later date. I note, from the February edition of *The Aquarist*, that current subscription rates are £5.30 per year or £2.65 per half year. Readers are reminded that I am no longer able to send personal replies to readers' queries; however, I'll continue to answer queries in this feature—when and if I know the answers! Queries requiring personal replies should be addressed to Mr. J. Hems or Mr. A. Boarder, as appropriate. A s.a.e. should *always* be enclosed.)

No. 68 Cavendish Road, Kersal, Salford, Lancs., heads a letter I received from Mrs. B. D. Mason. She had the following to say: "May I stick my oar in again? Regarding the February edition of your feature: ponds are *always* a problem in winter—sometimes a big headache and sometimes nothing more than a slight worry. Mostly, I suppose, the biggest problem is from dead leaves, because no matter how careful you think you have been about trawling them out there is always a thick and noise-some layer left behind, forming slimy sludge. This is also made up of large drowned earthworms, and smaller luckless denizens of the garden—such as harvestmen, mostly summer moths, though a few do get drowned in autumn and winter, and garden beetles, none of which deserves a miserable death like drowning. It is this latter that finally put me off keeping a pond; plus the difficulty of keeping fish alive and not letting them emulate Mr. Birdseye's products.

"The only floating plant I have any experience with in a tank is *Azolla*, but it is well nigh impossible to keep it since my fish eat it with single-minded greed and clean it up with amazing rapidity! In spite of various schools of thought, ranging from 'essential' to 'totally unnecessary,' I like aeration and will always use it; and it will take a brilliant scientist to persuade me that aeration is rubbish! For fry I use a liquid fry food every time; and then thoroughly powdered flake food after a few days. Brine shrimps? Not worth the bother—but the flakes must be dust fine for a week or so. Then you can relax and crumble the flakes a little less finely. I must end by remarking that the magazine is still an excellent one and long may it continue."

Photograph 1 shows a young discus. Please send me details of your experiences with this interesting species.

"I feel I must wholeheartedly endorse the comments of Mr. B. L. Richards. I have been an aquarist for several years now but have never felt the urge to enclose my aquarium in a tableau, and can see no reason for societies producing these strange creations for shows. I attended the B.A.F. in 1975 and 1976 and can assure you that I will not be going again until I hear that these grotesque tableaux have been abolished and that one may go to the festival to see fish and accessories."

"Surely an aquarist worthy of the name is one who takes an interest in water life, not woodwork and interior decorating. Perhaps in the future you may be advertising the British Aquarists & Do-It-Yourself Festival? Is there anyone else in the country who, like Mr. Sandfield, likes tableaux? Or anyone who can give me a reason for displaying aquaria in this, to me, odd way?" The above letter was written by Mr. M. W. Hoare, of 24 Didcot Drive, Marchington, Nr. Uttoxeter, Staffs. Do any other readers have opinions to express on this topic?

S. Sgt. G. Carter sent the following long letter from L.A.D. REME, 1 Bn. Devon-Dorset, BFPO 36: "With the advent of being posted to W. Germany and the coming winter I thought I must get myself an indoor hobby. Well, the first sight of a well kept tropical fish tank did the trick. I had previously kept tropicals for some years while in England but owing to movement of different postings had had to give them up. The tank I had seen was for sale as the owner had got 'the bug' and had bought a larger one. Getting it set up was no problem. Alan Barry, who apart from being my boss at work is a fellow aquarist, took me to a private German residence which happened to sell fish and equipment at far lower prices than the local shops. I did not have any worries as to what I wanted to keep. Previously in England I had kept dwarf cichlids so I thought I would try these fish. Dwarf cichlids, although not common here, are not as difficult to get hold of as I had found them to be in

England; so I soon had a small stock in my community tank. Amongst these was a pair of *P. pulcher* (Kribensis—see photograph 2) and a pair of *Apistogramma borelli* which, after an initial settling in period, soon showed signs of wanting to spawn. The *pulcher* took over a flowerpot at one end of the tank and the *borelli* under some slate at the other. The remainder decided it was both best and safest in the centre of the two warring factions. It was the *borelli* that really interested me as I had never seen these before and was now the owner of a small but breeding pair. Both pairs of fish were busy preparing their sites and protecting their areas from intruders that were foolish enough to stray over the invisible line. This carried on for several days and then the disappearance of both females signified that the eggs had been laid. Little was seen of them for the next three days, apart from the *pulcher* which would stick her nose out of the chip that



formed the door to the flowerpot. After this period they began to appear at more regular times, occasionally coming out to take *Tubifex* or *Daphnia* but not leaving their homes for long. At this stage the *pulcher* would allow the male into the flowerpot but the *borelli*, although he stood guard over the area, was not allowed anywhere near the home site.

"A problem then arose, for although I had ordered some breeding tanks I had not collected them; and within four days the fry would be free-swimming and I would lose the majority of them in the community tank. I wanted to leave the fry with the parents but at the same time had no wish to lose all of my first batch. A hurried trip, followed by a late night session setting up tanks, enabled me to provide a home for them provided they did not appear before the water had time to settle. My luck held out: it was not until the third day after the reappearance of the *pulcher* female that I saw the fry hopping around the pot. I left them a further day and then siphoned both lots of

fry into separate containers and transferred them, along with their parents, into the tanks in my cellar. Unfortunately the parents did not take to this move and had to be returned to the community tank when they started to eat the fry.

"Nearly all the fry survived the move—about 70 *borelli* and about 100 *pulcher*, although the latter were later to perish when a thermostat jammed. They are being reared on (a brand of fry food) and brine shrimps and kept in a tank of 120 cm. × 30 cm. × 35 cm., in slightly soft, acid water, brought about by peat in a corner filter. Altogether now I have nine breeding tanks, size 45 cm. × 30 cm. × 33 cm., two large fry tanks and my community tank. All the breeding tanks house pairs of fish and at present I have about 600 fry from 5 different species of fish. All my tanks are filled with tap water and have peat in all the filters. The temperature is kept between 28 and 20 C. I have



tried four different ways of removing the fry: 1. removing the eggs straight after spawning; 2. removing the fry at about the free swimming stage; 3. removing the fry after the free swimming stage; and 4. leaving the fry with the parents. Out of these I found the second method best, being easiest for removal of the fry, least disturbing for the parents and producing the highest survival rate.

"The breeding habits seem to differ from species to species, *A. borelli*, *A. ortmani*, *P. pulcher*, *subocellatus*, *taeniatus* and *pulcher CF* doing best in tanks of their own laying their eggs on hard surfaces. *Apistogramma ramirezi* will breed with as many pairs in the tank as you wish—I have five pairs in a small tank and have at present two lots of hatched fry and two batches of eggs—usually spawning on a hard surface. *A. ramirezi* is another which will spawn in a community but will choose either a pit or hard surface and

it is these that I find the hardest to raise, usually having them die off about 7-10 days after the free swimming stage. Any advice would be welcomed. I have fully grown pairs of the following dwarfs: *A. borelli*, *A. ortmani*, *A. reitzigi*, *A. kleei*, *A. ramirezi* (photograph 3), *Nannochromis nudiiceps*, *Nannacara anomala*, *P. thomasi*, *P. pulcher (kribensis)*, *P. pulcher CF*, *P. subocellatus* and *P. taeniatus*. I am always on the look out for different species and would be pleased to hear from anyone who would like to exchange or sell, or just communicate with me on, dwarf cichlids, especially the *nudiiceps* which I am finding increasingly difficult to get to spawn. If anyone wants any of the fry I have he or she should contact me and I will try to bring some home with me next time I come."

Mr. E. Stanton resides at 57 Medlock Crescent, Handsworth, Sheffield, and writes: "With reference to

your comments regarding aquarist shows I was most surprised to read your comments and amazed to find you agree with Mr. Richards as your magazines are the sponsors of the show in question. I believe you both missed, possibly intentionally, the real point(s) of such an exhibition. These include: 1. To stimulate interest in our hobby; 2. To stimulate friendship and comradeship; 3. To bring together all the interested parties—manufacturers, dealers and aquarists." Mr. Stanton goes on to say that it has been his privilege to assist in the planning of the Yorkshire Aquarist Festival and that it attracted more than 15,000 people last August. Speaking of its high standard he says: "Without the societies to help I feel it could never attain this high standard. The societies of Yorkshire are united by this common bond and it is only because they care that we can continue; so please Mr. White-side: please try to remember, it's easy to fall, we are in

opposition to no one, and open to all. If you don't like our Festival, you don't have to call." (I have nothing but admiration for the many people who put such hard work into aquarium shows of all kinds. When I had full use of both hands I carted more than a few cement blocks on which show tanks were staged; hence I know the effort required to set up such displays. I think aquarium shows do a lot for our hobby; but personally speaking I dislike tableaux displays. That's only my personal opinion: it doesn't mean that such displays are either good or bad. I've kept fishes and plants for well over a quarter of a century and am more interested in what's inside an aquarium than in what's outside or surrounding it. I'd certainly love to visit Mr. Stanton's show if I happened to be in England at the appropriate time.)

On now to a letter from one of our fellow hobbyists

common archer fish in the aquarium trade; all of my fish—purchased in different places at different times have been this species. So now I am searching for *T. jaculator*.

"The archer fish will do well in a community tank but even better in a special aquarium with a lot of space above the water surface. It is very easy to (teach it) to shoot down any kind of food from the glass, from tweezers or your fingers. One of the best foods is freeze dried *Artemia* but it will take almost everything. If it is well fed it will grow big and then it can be a danger to small fishes. It will also be a bit aggressive to its own kind. But the archer is a very, very interesting fish—and I think it will be a real 'pet' for you. At the moment I have four archer fish. The biggest one is now about 17 cm. long. They have laid eggs several times but I have not got any fry.



in a foreign country. It's from Mr. Jörgen Erlandsson, of Box 63, S-290 17 Everöd, Sweden. He writes: "... I have been reading *The Aquarist* for about one year. In the February issue you want information about the archer fish. This is one of my many favourites; others are mudskippers, elephant-nose fishes, clownfishes and, of course, cichlids. I know that my English is very poor but I hope you will understand it." (I'm typing Mr. Erlandsson's letter almost exactly as received and I blush at the fact that his English is much better than that of many people for whom English is their native tongue!) He continues: "There are six species in the family *Toxotidae*. Two (or more?) of these have been imported. The best choice is *Toxotes chatareus* because this species can live its whole life cycle in pure, fresh water and does not need any salt in the water. *T. chatareus* is very similar to the well-known *T. jaculator* but it has five stiff dorsal spines; *T. jaculator* has only four. I think *T. chatareus* is the most

I do not know if the eggs were fertilized. The photo was taken by my brother Kennet and shows one of my archers spitting at a meal worm beetle." (Unfortunately Mr. Erlandsson's photograph is in colour and would not reproduce well in these pages; nevertheless, it's an excellent photograph.)

Mr. A. W. McCabe wrote the following from his home at 26 Cruttenden Road, Great Moor, Stockport, Cheshire. "How do fellow aquarists manage their decorating/modernising jobs in the home when they have two or more tanks to cope with? You see, recently I had to decorate my living-room, and do a bit of modernising. The decorating part was easy; the hardest part was removing the occupants of the tanks so that I could site them in their new locations. It was then that my wife suggested that I used the 'old baby bath.' I dragged it out of the shed, washed it, half filled it with water boiled the night before, and topped it up with water from the large aquarium. I then fitted a heater in the bath and checked that

everything was correct. I had three tanks to move—one 48 in. × 12 in. × 15 in. and two 24 in. × 12 in. × 15 in. The tanks contained a number of cichlids, paradise fish, barbs, a catfish, two *ayomieri* and a loach. The latter three were the most difficult to catch.

"Once the last fish was in the bath I was able to take the tanks down at my leisure and refit them the following day. I returned the fish to the two 24 in. tanks the same night and they were none the worse for their experience; in fact one week later the angels spawned and continued to do so every three weeks. With the 48 in. tank empty I decided to have a go at breeding Lake Malawi cichlids. I purchased two *P. auratus* and two *Labotropheus fuelleborni* and exchanged fifty young blue acaras, which I had recently bred, for a pair of *P. johanni*. Three weeks after settling in the latter fish spawned. The eggs were rather large and a bright orange. I was unable to count the number of eggs she took into her mouth, but after sixteen days she released 26 young which were 1/2—1/3 in. long and all yellow. I removed the female and the young are feeding well; they are seven weeks old and 1 in. long. When they are big enough I hope to exchange them for some more Lake Malawi cichlids as I think that they are interesting fish to breed; plus the fact that they are rather colourful.

Master Neil Garbutt is 14 years old and writes to us from 379 Main Road, Bilton Hill, North Humberside. "I have four all-glass aquariums. I have had them for two years and I keep a mixed variety of coldwater fishes in them: golden orfe, shubunkins and bitterling. My tanks are illuminated by (coloured) fluorescent tubes and they are planted with healthy clumps of *Vallisneria*, *Bacopa*, *Myriophyllum* and hornwort. I use undergravel filters and find them excellent for coldwater tanks. I feed my fish on two popular brands of British foods and also give them *Daphnia*."

A week ago I decided to move my attractive veiltail goldfish from a coldwater to a tropical tank. Slowly I raised the temperature of the water until the fish had adjusted to the higher temperature. I decided to move the beautiful veiltail into a planted tank with four young kribensis. A couple of hours later I went to feed the fishes—and discovered that the kribis had shredded the flowing tail and fins of the goldfish. I quickly moved the kribensis (*P. pulcher*) to another tank. Now, a week later, the veiltail's fins are healing up well and the fish is eating large quantities of a good brand of British flake. I was amazed at the viciousness of the young kribensis. This story leads, appropriately, to another tale about coldwater fish.

Mrs. C. A. G. Wadley's address is 23 Green Lane, Lower Broadheath, Worcester, and her long letter was written on large sheets of white writing paper headed with an attractive design showing a water lily, reeds and goldfish. She tells us that the design, which she cut from lino and printed herself, is called "The Water-

garden,' and that she can supply it to those interested at 2p per sheet. Mrs. Wadley has the following to say: "After subscribing to *The Aquarist & Pondkeeper* for the past five months, and after first devouring every word written therein, my enthusiasm is beginning to wane as I repeatedly fail to find many articles about fancy coldwater fish in your WYO section." (Please accept my apologies; the situation reflects the fact that I own only one coldwater fish myself and, hence, I'm not so good at thinking up suitable topics for discussion; however, I'm always pleased to include topics sent in for discussion by any readers—so, if coldwater fanciers send me their topics or letters I'll certainly include as many as possible.) Mrs. Wadley continues: "So, I thought it about time that I wrote to you regarding my first exciting experiences in buying and breeding red-cap orandas in 1976, hoping that my experiences may prove likewise interesting to your readers. It was the last week in March and I was initially buying one 3 in. long red-cap oranda when my dealer happened to notice and mention to me that it was a male and showing breeding tubercles. I was interested; and as she had put about a dozen red-caps together in a container, I was carried away by their beauty in numbers and asked if she could find a female so that I could try and breed them. I was duly found a likely pair and armed with very rudimentary instructions for breeding procedures I took my pair home.

"On depositing them in the pond the small comet that had been reigning supreme began immediately chasing one of the orandas unceasingly. I could not at this stage tell the difference between the orandas, and in my ignorance I assumed that the comet was just exerting his supremacy in the pond; and I removed him into a bucket overnight to put him in his place! The next morning the first ill-omen of the disaster to follow struck: a mangy black cat fished my comet out of the bucket and ate him for breakfast. My comet was well and truly in his place! One week later I had acquired two 2 ft. long tanks and a goldfish book—which included a section on breeding. I brought the orandas inside to condition them for breeding. I decided to keep the orandas together in one tank as I still wasn't certain that I had a pair. I fed them a rich diet of fresh egg yolk, chopped earthworms, pellet food, flake food and Bemax, in rotation, and one of the orandas started to look decidedly pregnant.

"One Saturday, about the third week in April, I couldn't find one oranda; after searching all through the tank and over the entire floor area I discovered her in the bunch of weed in the corner of the tank, and *him* proceeding to chase her all over the aquarium. I panicked, being totally unprepared as my book had advised that spawning should take place in May. I took the male out of the tank; that night the female kept dashing into the weed, and the next morning

I witnessed for the first time fish eggs all over the bottom of the aquarium—unfertilized, of course. When I told my dealer she was highly amused, and has never let me live down the fact that I missed my first great spawning by removing the male!

"It took three more weeks and we had to go away for the weekend, leaving my very pregnant female oranda and her male partner together under the watchful eye of my neighbour who, in fear of missing the great event, came in morning and evening to inspect the tank for eggs. However, my clever female oranda waited until I returned. The day I started work I was dashing out of the front door when I noticed my prize progeny were at it again. Dilemma! Should I phone work and tell them I'd be late as my fishes were spawning? Of course, everyone at work knew of my great venture by this time. I used white nylon knitting yarn suspended in bundles by squares of polystyrene foam. This made a soft, sterile, floating, spawning medium. When I returned from work at lunch time they were still spawning avidly; so I removed some bunches of wool that were full of eggs and by about 5.00 p.m. the orandas looked exhausted. So I removed all the remaining bunches of wool with the eggs to another sterile tank and fed the orandas. About 300 eggs hatched in four days at 65°F in a 2 ft. tank; they looked like two eyes propelled by a tail.

"In my inexperience I was less than generous with the supply of green water in the early stages, so the fry were slow to grow at first. However, they progressed to egg yolk and baby milk powder suspensions and eventually to baby *Daphnia*. The hours of back-breaking sifting of *Daphnia* were highly rewarded by the visible swelling of the fry's stomachs after they had eaten the *Daphnia*. By the way, prior to my fry graduating to *Daphnia* my inexperience took its toll again in my losing many fry through overcrowding in the one tank too long before spreading them out into other containers. However, I had given a few fry to my dealer in order that she could help to cope with the large numbers, so all was not lost. One day, when my much fretted-over fry were $\frac{1}{2}$ in. long, I happened to notice a movement in the container holding green water in a sunny spot in my garden. The water in this foot square container was a thick pea soup green and at one stage had harboured mosquito larvae which had mysteriously disappeared. The temperature must have ranged from the lower sixties to the upper nineties.

"I found in this container a good $\frac{1}{2}$ in. plump oranda! It must have arrived there by accident whilst I was changing tank water for green water in the early stages of fry feeding. I could not believe that this fish could have grown to three times the size of my much look-after babies with nothing more than green water, fresh air and sunlight to sustain it. It was after this amazing discovery, in July, that I decided that some of my fry should go outside into containers

of green water, with floating food pellets to supplement their diet. They grew amazingly faster than those fry indoors and showed their colours much sooner. It was after I had released the parent fishes back into the pond that the 'black mange' struck again: my two beautiful breeding orandas became the next victims of the mangy black cat, which ate them for breakfast one morning. However, now I have six white orandas, two red and white orandas, and four red-cap orandas. By the way, the biggest and most impressive red-cap is—you've guessed—the one that was found abandoned in the green water tank. He is 2 in. in body length; the others are $1\frac{1}{2}$ in. I hope to breed these youngsters this spring. Some are already showing the hood development and have beautiful high dorsal fins and clearly divided caudal fins carried very erect.

"Well, here endeth my red-cap oranda saga, and the moral of the miracle properties of green water and sunlight. I have learnt a great deal about breeding these fishes from my mistakes and also that one should never give up—no matter what mishaps prevail!" (I wonder if Mrs. Wadley's letter holds the record for the longest I've ever included, uncut. It proves one thing that I've said before: fishes tend not to read the books that tell us how and when they should behave!)

My thanks to the Newcastle Guppy and Livebearer Society for sending me copies of their interesting Newsletter. An article that would interest many aquarists gives details of two effective ways of sending fish from one aquarist to another living in different parts of the U.K. Entitled 'Stock Distribution,' it was written by Mr. Alan Charlton. The editor of the Newsletter is Mrs. J. Renton, of 128 Dunstan Tower, Garth 18, Killingworth, Newcastle-upon-Tyne.

I'm afraid that's all this month's space used up. I hope to be able to include some more of the many letters I received this month in next month's tenth anniversary edition of this feature. For a future feature please send me your opinions on any of the following: (a) keeping coldwater fishes at tropical temperatures; (b) designs for garden ponds (avoid diagrams, if possible); (c) the prices of fishes and aquatic plants; (d) uncommon tropical plants; (e) uncommon livebearers; (f) the use of peat in outside filters; (g) plants suitable for growing around the garden pool; (h) the use of ozone in marine aquaria; (i) raising the fry of angelfish; and (j) the breeding of large cichlids. I hope you'll send me a letter about one or more of the above topics—or about any facet of the hobby that takes your fancy. Happy fish-keeping!

ANSWER TO NOT A VERY GOOD MIXER

ORANGE CHROMIDE

THE AQUARIST

ARACEAE FAMILY (2)

Genera:

Acorus,

Orontium,

Pistia

by Vivian De Thabrew

THERE ARE FIVE species in these three genera which appear from time to time on the aquatic market. However, none of these is really suitable for the aquarium, as most aquarists who have tried these plants in their aquaria will have discovered. No matter what we attempt to do, we cannot change the physiological pattern of vascular aquatic plants. However, *Pistia stratiotes*, if given sufficient humidity, will grow well as a floating plant in the home aquarium.

Acorus

Family: Araceae

Genus: *Acorus*

Acorus species are marshy perennial plants which are more suited to vivarium and garden pools than indoor aquaria, though three or four species are frequently offered to the aquarist. All these plants do not live for long in the aquarium in a submerged condition.

Acorus calamus L. var. *angustifolius* (Schott) Engler
(Sweet Flag)

Habitat: In tropical Asia and exclusively India, Java, Sri Lanka and Celebes. Frequently in marshy areas and sometimes by river banks. In Sri Lanka and India, this is commonly grown in moist areas in many household gardens, as it is a valuable herb.

Description: The plant has a vigorous creeping

rhizome which bears narrow, flat, long leaves arranged in pairs forming a rosette. These leaves, deep green and pointed, grow to a length of up to two feet and two to three inches wide. This is, of course, in the wild and it hardly reaches such proportions in the aquarium, where it may grow up to ten inches in length. Strong roots spread out from the rhizome downwards and cling to the substrata. Young plants emerge round the main rosette, hugging it tightly.

Cultivation and propagation: Sweet Flag has naturalised in the temperate zone, and is now seen as a marsh plant in many areas of Britain. *A. angustifolius* is a very decorative and firm plant. It requires plenty of light and a temperature of about 72°F. In poor light conditions the plant is stunted. The water condition could be either slightly acid or even neutral.

A muddy tank bottom is essential for its healthy growth, and a mixture of unwashed river sand and clay is suitable. If requires a well sifted garden loam can be mixed with sand and a small quantity of peat or leaf mould.

The plant will only thrive in the heated aquarium for a few months, then it will die off. It will do better in the coldwater aquarium, however, at a temperature range of around 65°-70°F.

Propagation is by means of root division. The small plant should be planted in a similar medium. Once transplanted it should not be submerged, but

emersed in water to about half its height. Over a period of two weeks, gradually increase the water level so that eventually the plant is submerged. Plants grown in this way will live submerged for up to four months. In the East, especially in India and Sri Lanka, the rhizomes of *Acorus* are commonly used for healing bruises, rheumatism, bladder disorders and for clearing eye infections.



Acorus gramineus (Alton) Solander

Habitat: North-eastern Asia, especially in China, Japan and sporadically on the Malayan mainland.

Description: The plants are fan-shaped rosettes consisting of narrow, pointed, flat, long, grass-like, bright green leaves which are up to six inches long.

Cultivation and propagation: This is absolutely unsuitable for the submerged aquarium condition: it is only suitable for a well-lit vivarium with a moderate temperature.

In the vivarium the muddy or loam terrain should not contain more than adequate moisture, as water-logging may destroy the plant. Propagation is by root division.

Acorus calamus var. *pusillus* (Sieb.) Engler
(Dwarf Sweet Flag or Dwarf Rush)

Yet another species offered to the aquarist, this will tolerate submerged conditions for a few months, and then die.

Description: The plant forms a small rosette with dark green, stiff, long, flat, narrow leaves, which hardly exceed five inches in length.

Cultivation and propagation: A low temperature of around 65° F and slightly acidic water conditions are tolerated. The planting medium should be sandy and fairly deep. Suited only for the vivarium. Propagation is by root division.

Acorus calamus subsp. *foliis variegatis*
(Variegated Rush)

Perhaps the most common and extensively grown rush on the market.

Like the Dwarf Rush, its requirements are: low temperature, slightly acid water, good light and marshy terrain.

The plant is ideal for the vivarium but not for the aquarium. It survives under water for a very few months and then rots away.

All the above described species can be easily and successfully grown in small containers, such as flower-pots and glass jars. Keep the container nicely moist.

Orontium aquaticum (American Cryptocoryne)

Family: Araceae

Genus: *Orontium*

Habitat: Eastern North America, especially Louisiana, Mississippi and Florida.

Description: This is a swamp or marsh plant with creeping rhizome bearing a rosette or cluster of long lanceolate or elliptical blue-green leaves about ten to twelve inches long. These leaves are borne on long fleshy petioles (leaf-stalks). Usually the leaf has four parallel veins either side of the mid-rib. The leaves growing from the rootstock eventually float on the surface, their undersides being light green.

Cultivation and propagation: This marsh plant requires a shallow aquarium with a rooting medium consisting of clay, sand and peat, or loam, sand and clay. It also requires slightly acidic water of medium hardness, and a temperature range of 60°-70° F. It demands an ample amount of sunshine and also a winter rest period.

If grown in the aquarium, it should be put out during the summer to develop into a stronger plant under natural conditions.

Propagation is by means of root division and shoot transplanting.

Like the *Acorus* species, it is not recommended for the heated aquarium.



*Oroxylum
aquaticum*
(American
Cryptocoryne)

Pistia stratiotes L. (Water Lettuce)

Family: Araceae

Genus: *Pistia*

Habitat: Most tropical countries, in slow moving water courses and still-water ponds.

Description: This is a floating plant with large, light green, petal-like leaves, which are fleshy, slightly downy and containing nervation which makes longitudinal grooves. The outer edges of the leaves are curled outwards. The roots are dense and form tufts which grow down, often reaching the tank bottom. The plants themselves grow in clusters, forming a canopy on the water surface. As the popular name indicates, it resembles a lettuce.

Cultivation and propagation: *Pistia* requires a high degree of humidity, and therefore it is absolutely essential to provide this in your aquarium. Very strong light and a temperature of at least 74°F are also essential. The water should be soft or medium-hard, and slightly acid to neutral. As it eventually sends roots to the bottom, the planting medium in the tank should contain adequate nutritious material. It

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adapts very well to a land form, when it grows almost like a lettuce on moist soil.

Aquarium cultivation of this plant is difficult, but it can thrive in a greenhouse or hot-house where strong light and plenty of it will reach it from the top. The downy leaves repel water, but if drops of water penetrate and remain on the surface, then the leaves will begin to rot. Once ideal conditions are achieved it will grow rapidly and multiply profusely.

The plant propagates by means of numerous stolons, which put out new buds in the form of



Pistia stratiotes
(Water Lettuce)

rosettes. Propagation by seed is also practical. The seeds require a very high temperature to germinate.

During my last plant expedition, I had the opportunity of studying this plant in its natural habitat over two months. On this occasion the full cycle of its growth was observed, and the rather intriguing flower stage was especially scrutinised. The flower, which is yellowish, white, about an inch long, tubular and fleshy, in the form of a spike, appears from the hollow formed by the bases of the leaves. The two stamens grow immediately above the ovary situated at the very bottom of the spike.



A sub-adult Ladder snake from the Sierra de Gredos in Spain.

THE LADDER-SNAKE

Written & illustrated by Chris Mattison

THE LADDER SNAKE, which occurs in Spain and Portugal and in parts of southern France, is a member of a genus which has representatives over a wide area of Asia, and in North and Central America. In common with many of these related forms, the juvenile markings differ greatly from those of the adult. Very young specimens are creamy white in colour with a series of connected black H-shaped markings along their backs, from the neck to the tail. The impression given by these markings suggests the snake's common name. In addition to the dorsal markings, a black oblique stripe runs from the eye to the angle of the mouth, and there is a further black spot beneath the eye. As the snake grows, and therefore sheds its skin, the ground colour gradually darkens, and the 'rungs' of the ladder fade until, when about two to three years of age, the now adult snake is pale brown with two dusky lines running the length of its body. The illustration shows a half-grown snake with intermediate markings. They eventually reach a length of three to four feet, although specimens of five feet have been reported.

Although its distribution covers the whole of the Iberian peninsular and parts of southern France, its occurrence would appear to be limited within this range to isolated areas providing suitable habitats. Authorities differ as to the exact type of environment favoured, but in my own experience this species prefers mountainous regions where it lives on the lower slopes, in glades amongst pinewoods. Thus, in 1975, during a collecting trip covering many parts of Spain, the only four specimens found were captured in the foothills of the Sierra de Gredos, along tracks and in small

clearings. Even so, all of these were found beneath rocks, and could so easily have been overlooked.

This species lays a small number of eggs (about nine), in early summer. The hatchlings probably feed on young lizards and invertebrates, when their more usual food of newly-born rodents is not available. As they grow, they become capable of taking adult mice, shrews, and voles, and these animals almost certainly form the staple food of adult Ladder snakes. In captivity they thrive on a diet of mice, which should be of a size appropriate to the size of the snake concerned. Being a secretive species by nature, they settle down to captivity and commence feeding much more readily if ample cover is provided in their vivarium. I have found that an inverted flower-pot is readily occupied, the drainage hole being used as an entrance and exit by the snake, as well as providing a convenient method of introducing the food to the hidden reptile with the minimum of disturbance.

Water to drink and soak in should be provided at all times, and a substrate of pine needles with one or two pine branches makes an attractive display in keeping with the animals' natural habitat, at least in the case of my specimens.

In temperament this species is very aggressive at first, hissing and biting furiously when handled, the bite, of course, being completely harmless. After a short time in captivity, however, the juveniles at least will tolerate gentle handling without retaliation.

This is a species of snake about which very little appears to be known with regard to its habits and natural history and which therefore deserves further investigation, much of which could be done by serious amateur herpetologists, using captive specimens.

THE PLEASURES OF PEBBLE HUNTING

by Henry Tegner

WHEN the peoples of this country still wore the skins of animals and painted their faces with woad the more sophisticated races of the Mediterranean lands came here to barter for our furs, lead, tin, silver, gold and precious pearls. In exchange our great, great ancestors would accept cloth, ceramics, and domestic stock such as cats and goats. This, of course, is mostly conjecture but there is evidence, in graves and caves, to support this picture. That the minerals of the British Isles were highly prized then there seems little doubt and so they are today but in a rather different context. The big commercial companies are busy exploring derelict mine sites for such materials as fluorspar whilst the old lead lodes of Cornwall are being surveyed again. Wales is being searched in parts for possible gold stratas. Most of the material under survey is for industrial purposes. Fluorspar is used extensively in aluminium production. Whether much of our presently unused mineral wealth will become viable commercial undertakings remains to be seen.

In another sphere altogether there has also been a recent revival in the search for semi-precious stones. The jeweller today stocks, extensively with cheap synthetic ornaments, the polished quartzes and pebbles of this country. The majority of the natural gems used in ornamental jewellery consist of quartz in some form or another; both diamonds and rubies are hard quartzes but these expensive stones are hardly likely to be found in Britain. The British Isles, however, contain limitless quantities of the less valuable quartzes. Quartz may be described as stone of a pure crystalline silica. Most quartzes are of volcanic origin, and so to find them one has to go to such places as the high hills, once of volcanic origin, or to the upper reaches of our myriad streams and

rivers which have their sources in the mountains. The water of our burns and becks have, over the aeons, brought down with them, in their flowing, thousands of pretty pebbles to their lower reaches as well as right down to the coastal beaches. Such semi-precious stones as agate, onyx, chalcedony, amethyst, citrine and the pretty chrysoberyl, may well be found on the beaches or in the gravels by the side of some swift-running mountain stream. Pebble hunting has taken on a new lease of life in this modern world of ours and there are good reasons for this.

Not that we have become stone-age man again but with our increased leisure and with our greater mobility we are now able, in much greater measure than our parents and grandparents did before us, to explore and to hunt in the pleasant places of our islands for the many varieties of pretty semi-precious stones and minerals which they contain.

In the latter part of the last century and the early part of this one, there were many little jewellers who would cut and polish specimen stones for one, now the advent of home lapidary devices like cutting tools, polishing wheels and miniature tumblers, all capable of being driven off one's home electric supply, have made "do-it-yourself" lapidary an easy, pleasant pastime.

One of the most popular and highly prized jewel stones of volcanic origin is the so-called Cairn Gorm. This quartz is so-named because many of the best specimens have originated in the high hills of the Cairn Gorm range in Scotland. This is a vast area stretching as it does almost right across the widest part of Scotland. One of the biggest Cairn Gorms ever found was presented to Queen Victoria, it is the size of a clenched fist. I was presented with a splendid

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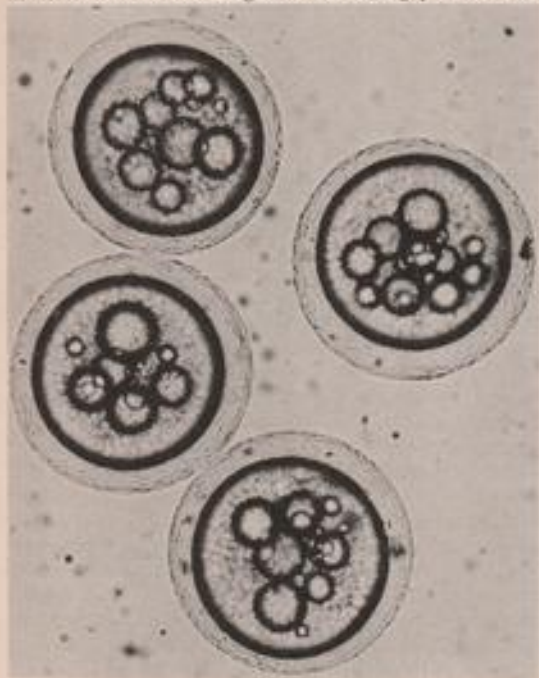
From a Naturalist's Notebook

by Eric Hardy

THE life history of the common freshwater eel has always been one of the great stories of fish biology. First it was the Danish Johannes Schmidt's progressive recovery of elvers diminishing in size back along the Gulf Stream which linked their breeding with the Sargasso Sea, a discovery he lectured on when the British Association met in Liverpool in 1923. Then his assistant, Dr. Fish, discovered the first egg at the Sargasso Sea. In 1970 eels were first spawned artificially by Japanese researchers, using *Anguilla japonica* females of seven and eight years injected with hormones and pituitary extract from a rainbow trout. Tucker's post-war theory that an accidental drift brought Europe the same eel involved in the Gulf Stream, which normally turned up in American rivers, received little support. Prof. Vladykov, of Ottawa, argued that the American eel spawned much further south or east of the Sargasso. Growing yellow in its

freshwater days in our ponds and lakes, then turning silver as they migrate back against the Atlantic current, eels have no environmental difference between sexes. In 1966 the first marked Atlantic crossing was one tagged at Berlin and recovered 4,650 miles away three years two months later in Savannah Harbour, Georgia, U.S.A.

Commercial interest inspired much recent research on the continent, culminating in successfully breeding them in the Danish National Aquarium. What triggers the sudden sexual maturity of male and female after a journey of over 6,000 km from Europe back to the Sargasso where they were born isn't clearly understood. The first male eel induced to reach maturity by hormone injection was in an aquarium in a French laboratory in 1936; but similar efforts to stimulate the female failed. It took Inge and Jan Boetius 15 years to achieve their recent success in



Left: Eggs of European eel in the Danish National Aquarium.

Above: In the same establishment, eel eggs being fertilised.

Photos: Jan Boetius.

Denmark, then obtain eggs and fertilise them with male milt. But even here the process of cell-division stopped soon after fertilization and so far elvers have not been produced at the aquarium.

Incidentally, one of the earliest records of aquarists is the Roman Licinius, nicknamed Muraena about 200 B.C. for his enthusiastic keeping of captive eels which became popular pets with the ancient Romans. These were apparently the marine eel, or murry. Ancient Egyptians and Greeks also kept soles in special flatfish-tanks and, with some difficulty, mullets.

Now with nearly £5m. state subsidy, the Nature Conservancy Council is conducting a series of freshwater researches, including the number and range of British waters and a checklist of organisms inhabiting them. Visitors to Norfolk's big Hickling Broad will have noticed areas of water enclosed in huge rubber tubes, the "Lund tubes" originally designed for waterlife studies by Dr. John Lund at Belham Tarn and other Lakeland waters. These isolate sections of the broad from chemical changes in surrounding water outside the tube boundary, in order to conduct controlled experiments.

157 different aquatic plants have been recorded in the dykes around the Broadland's grazing marshes, now a valuable habitat in the recent biological degradation of the Broad. A £60,000 research by the University of East Anglia is to find how to restore this lost aquatic wildlife. Fish are killed by periodical outbreaks of the alga *Prymnesium peruvianum*, and avian botulism also occurs. The 126-page second annual report of the N.C.C., received recently (HMSO £2.75) states that the most important cause of these is "treated sewage effluent and from farm fertilisers," which stimulate the growth of minute algae, reducing light penetration.

Their survey at Woodwalton Fen reserve, between Huntingdon and Peterborough, shows that beetles favour a habitat of bullrushes rather than of common reed, so cutting the latter allows other plant species to flourish. Grazing and trampling by cattle also helped to increase the variety of species in a dyke and to reduce the spread of reed. Calthorpe Broad is unusually rich in water plants.

When the 3,100 acres (1,250 hectares) Empingham reservoir is completed in Leicestershire, it will be England's largest artificial sheet of water. 350 acres of its shallow end are being established as a local reserve. Likewise, part of the new 700-acre Bewl Bridge reservoir on the Kent/Sussex border will be a reserve. Surveys have been made of the aquatic fauna and flora of Wentloog Levels, near Cardiff, threatened by industrial development, and of Loch Sween (by the Scottish Marine Biological Association) while much of the excess vegetation like waterlilies has had to be cut back from the famous pools on the Oxwich reserve in Gower, South Wales.

Have you seen the white cave-fish, found at times in

the underground waters of Durham, Yorkshire and South Wales? Most of these are common brown trout, blanched in a normal response to darkness. Sometimes there are other common fish, never any of the specially adapted blind cavefish of abroad. Water-beetles are also found there. Even the blind, almost white olm, a slender salamander found in far underground Yugoslav streams, doesn't occur here.

These are among the interesting occupants of the deeper, dark inner depths of caves in T. D. Ford and C. H. D. Cullingford's new 593-page book *The Science of Speleology* (Academic Press, £14), a technical work covering mostly British caves, but referring briefly to major foreign ones. Since Cullingford's classic work on *British Caving*, 15 years of progress have made this a science. This book has separate chapters by 22 experts on the structure, water chemistry, minerals and fossils, and on detection and surveys. Only about two-thirds deal with the subterranean occupants, mainly tiny crustaceans, springtails, a few beetles and spiders, moulds and bacteria, with a good chapter on bats. It is the most up-to-date and comprehensive summary of scientific information for any caver, though poorly indexed. More than half the book deals with the physical side of caves and caving, with all too brief space left for fauna and flora. Its single paragraph on cave-fish makes no specific mention, not even the blind, silvery *Anoptichthys jordani*, discovered in Mexico in 1936. Four paragraphs are given to amphipod crustaceans (freshwater shrimps) without mentioning the interesting blind, unpigmented subterranean *Eriopsis longiramus* discovered on the Red Sea island of Entedebir in 1962. While naturally excluding normally outdoor plants intruding into the dimly-lit cave entrance, the account of cave flora does not even mention such distinctive cave adaptations as the luminous moss, *Schistostegi*, which glows at us like a handful of emeralds in the sandstone Hell Holes at Yorkshire's Hardcastle Crag, as well as at Beeston Castle in Cheshire, Betws-y-Coed and near Conway Falls in Wales, and on Dartmoor.

Apropos my recent reference to parasites introduced with alien fish, the North West Water Authority now fears such a risk to native salmon if Scottish hatcheries go ahead with plans to introduce eggs of Pacific Coho salmon, *Oncorhynchus kisutch*. After the last war, Russian hatcheries made an unsuccessful attempt to introduce Pacific hump-backed or pink salmon *O. gorbuscha*, into rivers of the Barents Sea, though a few stragglers reached Scottish and one Lakeland river. Last October 13,500 Atlantic salmon fingerlings from a local hatchery were released in Australia's Lake Jindabyne, N.S.W., where 14,000 were liberated in 1975. Other waters there, like Lake Burrinjuck, have been used to try to establish a land-locked race. Pacific Quinnet salmon *O. tshawytscha*, have been introduced successfully to New Zealand's South Island without

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EXPERIENCES WITH THE BLUE ACARA

by D. E. Battle

HAVING READ and enjoyed Barry Durham's articles about Fat Aggie and Herbert I wondered if readers might be interested in my own experiences with a pair of Blue Acara (*Aequidens pulcher*).

I bought two young fish, about $\frac{1}{2}$ in. long, at my local pet shop to add to a 4 ft. community tank that had been in existence for some time. It was stocked with 4 Firemouths, a pair of Angels, a pair of Pearl Gouramis, 4 unidentified mouthbrooders, a few assorted livebearers, Barbs and a couple of small Catfish. At this time I was not intending to breed any of these fish except the Angels which had spawned a few days previously, and I was concentrating all my efforts on raising as many of the fry as possible and things were going quite well on that front. I hoped later to spawn the Firemouths and perhaps the mouthbrooders but at the moment it was 'Angels or bust.'

The fish in the 4 ft. community tank were fed at least twice a day with either porridge, *tubifex*, Tetra-min flakes, or bloodworms. So growth was quite rapid and the fish themselves always active and healthy. The Blue Acaras soon reached a body length of 2 in. and appeared quite content though they did seem to have a tendency to hide in or around the caves provided.

Then one day, to my complete surprise, I saw that they were fanning and guarding eggs they had laid on a leaf. My first thought was that they were two females and the eggs would prove infertile; this is quite a usual occurrence with Angels. Anyway I started to read my reference books on Acara just in case. It seemed to be perfectly obvious that my fish had not taken the trouble to read the books themselves before setting up house as they had got everything wrong. Firstly, according to the books they should have been 4 in. long before they spawned—my two fish were only $2\frac{1}{2}$ in. including tails. Then they should have either spawned on a flat stone or in a pit in the gravel, but never on a leaf. Then I had not seen any of the usual cichlid courting procedures and

neither could I tell which of my fish was female and which male. However, that was of little importance providing the fish themselves knew the difference and surely they had demonstrated that point quite well. Anyway, whatever way you looked at it, there was something not right with my fish or the book.

Meanwhile back in the community tank the parent fish were happily guarding their eggs and both taking turns in fanning. The only fly in the ointment was that the leaf the parents had chosen was not very securely attached to the rest of the plant and in fact by the end of the day had indeed detached itself and was floating near the top of the tank with the parent fish, rather bewildered, helicoptering up and down between the leaf's old and new position. I was now in a dilemma myself—should I take the eggs and try to raise the fry or should I leave them all to their own devices? My books all told me what good parents Acara were but surely not under these circumstances? None of the eggs had fungussed so I thought that after all, the fish must be right and the eggs fertile. So I would try and raise a few but they would have to take second place to my Angels!

That decided I took a small tank (9 in. \times 6 in. \times 6 in.) placed the leaf inside with an airstone and floated the lot in the community tank, then stood back and waited (a formula that I had used successfully to rear Angels). 24 hours later the eggs began hatching and as far as I could see there were only about $\frac{1}{2}$ dozen fungussed eggs and the hatching appeared to be in the region of 200 fry. They were free-swimming after 4 days and feeding well on newly-hatched brine shrimps. Then, one week later, the fry started to die a few at a time until they had all gone. There appeared to be no reason for it and as I was more involved with the Angels I gave it no more thought for the time being except to wonder if the parents' small size was possibly the reason.

However, back in the community tank the parent Acaras were fighting furiously, each blaming the other,

no doubt, for the disappearing eggs. Anyway, they would have to sort matters without any help from me. But that was not entirely true. Because of house alterations the community tank had to be moved and all the fish rehoused in other tanks. That then was my first unsuccessful experience of breeding the Blue Acara, but I hoped that my next attempt would end with better results.

Some 6 months passed before I was able to set up again my 4 ft. community tank and start to get my fish back into their proper quarters. I now had a 3 ft. x 15 in. x 12 in. tank going free (having just disposed of the last of the Angels) and it seemed a good idea to put it over to the pair of Acara, which had grown to about 3 in. body length by now, and the pair of Gouramis which had never shown any interest at all in each other although the female was always rounded with roe. The tank was therefore set up and the 4 fish introduced. The Acaras immediately occupied separate caves and the Gouramis continued to ignore each other—the only time the Acaras ventured from their separate caves was for a quick dash at meal times.

This state of affairs continued for about a week and gradually the male Acara began to venture out and pay court on the lady of his choice. Her response at first was not encouraging to him or to me—she didn't seem to be interested. Then one evening when I got home from work there they were 'jawlocked' together and neither giving way even when offered food. The struggle seemed to have been so fierce that the next morning both the male and female fish were actually marked as though bruised just above and below the lips but once again they seemed to be ignoring each other. But now there was a new development with the male Gourami beginning to colour up and he was even seen to gently prod the female but he had made no attempt to build a bubble nest. Still, it was a beginning and I now raised my hopes of a spawning of the Gouramis soon. However, that was not to be because the next evening when I returned from work the first thing to catch my eye was that the Acara had spawned on a near upright rock surface and were quite happily fanning the eggs. They didn't seem to be upset at all by the presence of the pair of Gouramis who were now just back to normal and ignoring each other. I therefore decided to leave matters as they were for the time being and await developments.

The eggs hatched in 48 hours and to my surprise each one dropped from the rock as it hatched but was at once picked up by one or the other of the parents (dependent on which one was on duty) and spat into a previously prepared hollow in the gravel. When the last of the fertile eggs had hatched the parents then proceeded to eat any of the infertile eggs still on the rock. Now that the eggs had hatched the male seemed to be spending less and less time guarding the eggs and although he was always nearby, all the work seemed to be falling to the female. But then from

observation I discovered why this was so—although the male turned up to take his share of the work he had no sooner relieved the female than she was back to take up the vigil again. I got the distinct impression she didn't trust him. After about 48 hours in this pit a new pit had been prepared and the fry transferred to their new home. All was harmony in the tank but I couldn't see it lasting once the fry were free-swimming, so I decided to take the fry before any trouble began and to rear them separately.

Once more it was back to the small tank, 9 in. x 6 in. x 6 in., floating in the big community tank and feeding newly-hatched brine shrimps. So I caught the fry, by syphoning them from the pit (they numbered about 50) and then putting them into the nursery tank. The fry began swimming the day after the transfer and feeding very well on brine shrimps. Growth was rapid and after 2 weeks they had doubled their size. It looked as if I had solved my problem of the Acara, or had I, because the very next day there was a new batch of Acara eggs on the usual rock.

A new problem, indeed, because this time there appeared to be more eggs than ever and I was running short of accommodation again. After the usual 48 hours the eggs hatched and the parents moved them as before into a newly dug pit. Then I came to my decision. I would take the fry even if I did have problems accommodating them now and disposing of them later (our two local shops are not very adventurous as regards fish stocks). The day before the fry were ready to become free-swimming I again attempted to syphon off the young, only this time there was a difference—the female Acara seemed to have learned what a dip—tube did to her last hatching. As soon as I got near to the hollow nest she gave one large swipe with her tail and scattered the young over a large area. However, I persevered and managed to collect about 50 youngsters before I called it a day. I then spent a couple of hours watching the parent fish bustle around the tank collecting all the ones I had missed. As soon as they got them all the male proceeded to dig a new pit some distance away and both parents moved the remaining youngsters to the new site. As space was a problem now I was forced to leave matters as they stood and as the pair of Gouramis were still in the tank I didn't have much hope of survival for these youngsters.

Once again I was to be proved wrong because although I took no steps to feed these fry not only did they survive but they flourished. They were growing faster than the fry I had taken away and they appeared stronger fish altogether. Indeed, it was quite a sight to watch the parents shepherding their 'flock' of youngsters around and protecting them from the Gouramis.

Then ten days later I was given yet one more surprise but this time by the Gouramis. I noticed

one evening that the Gouramis had a nest and that there were indeed fry swimming around at the top of the tank. I hadn't even realised that they had spawned. Anyway, once again I attempted to rescue these fry and although I realised they would prove difficult to rear, I am trying. At the moment the Blue Acaras are successfully raising their youngsters in the tank whilst my efforts to raise their fry separately have all failed for one reason or another. They are such model parents that they have even inspired the Pearl Gouramis to become parents. I intend to leave

the fry, which are now 3 or even 4 times as big as at time of hatching a month ago, with their parents as long as possible.

Incidentally, I think I may have solved the mystery of how the babies are fed. I've noticed that the parents appear to take food, chew it up and spit it out in tiny pieces for the fry. But I must admit I've not seen the youngsters eat any of this regurgitated food. Perhaps other readers might wish to comment on my experiences with Blue Acara.

FROM A NATURALIST'S NOTEBOOK *Continued from page 27*

any noticeable disease risk. With experimental hatcheries and an aquarium in Adelaide, giant perch (barramundi) are being introduced to Australia's new Lake Argyle, after removing its proliferation of silver cobblers.

There has recently been some controversy as to whether angling is cruel to fish. One might find more evidence in experiments with chemical for safe, effective and economical sedation of fish to remove them from ponds when transplanting, or collect them alive for scientific work. Three researchers at the U.S. Government fish-control laboratories found the insecticide thanite (82 per cent isobornyl thiocyanate), used with kerosene and an emulsifier, Atlox 1045A, in the ratio 70:20:10 parts by volume, to be effective with most fish except carp and catfish. Excepting for pike, they recover in about 1½ hours. But the fish can't find it very comfortable for some reacted in the experimental ponds by jumping or rushing across the surface until sedated, when the

either sank to the bottom or floated at the surface. Small fish succumbed first and died soonest when too much was used. Obviously such chemicals for collecting live fish can only be used by skilled people under special permit. They could be dangerous in the hands of fish poachers in static water. Experiments with varied strengths of fish-poison, Noxfish (5 per cent rotenone) found goldfish and black bullheads most resistant and Atlantic salmon most sensitive. It then detoxifies with the aid of potassium permanganate over several days according to temperature.

An R.A.F. reader, A. S. Hayter, wrote to me after seeing two common gulls persistently pursuing a kingfisher along a dyke near Doncaster last December. The kingfisher weaved about constantly to dodge the gulls, which dived after it into the reeds. Gulls commonly mob other birds. Though I haven't known them attack a kingfisher before, it is not surprising with so conspicuous a bird.

THE PLEASURES OF PEBBLE HUNTING *Continued from page 27*

specimen by the late William Marshall of Nethybridge, then the nature correspondent of the *Northern Scot*, who had found it in Coire Lochan above Glenmore. It weighs three quarters of a pound and measures 2½ in. × 2½ in. Cairn Gorms vary in colour according to the amount of iron present, some are wine-coloured, others a clear yellow. This clear yellow quartz may be found in many places and many parts of the world. The likelihood is that a great part of the Cairn Gorm jewellery sold in Scotland today may well have come from some foreign country. The present demand for semi-precious stones has undoubtedly brought here from abroad considerable quantities of stones from Asia, Canada and South America. It is difficult, if not impossible, for the inexpert, or even the experienced to differentiate between indigenous and imported stones. The same applies to amethysts, charming violet-tinted stones; these may be imported or indigenous. Good amethysts, however, are to be found in many parts of the British Isles. To list all

the semi-precious stones available, in these islands, would almost need a dictionary. A very useful book for the pebble-hunter is Clarence Ellis' *Pebbles on the Beach*, now published as a paper-back.

Apart from rivers, beaches and the higher mountain reaches, good places for the jewel seeker are the spoil heaps of old disused lead, tin and even gold mines. Quarries often prove lucrative places.

As in so many other fields of life the quest, hunt or search, for the objects one desires is the greatest incentive and pleasure to be obtained from one's hobby. The preparatory planning, the study of maps, the exploration of new places, all these add to the zest of collecting pretty stones and once a collection is made one can, at little cost, polish and set them oneself or, as I do, assemble them in stone cornucopias in the garden where they make very attractive ornaments—so attractive in fact that on occasion the children from the village have appropriated one or two pretty pebbles for their playthings!



from AQUARISTS' SOCIETIES

Monthly reports from Secretaries of aquarist societies for inclusion on this page should reach the Editor by 5th of the month preceding the month of publication.

SLIDES and a talk on catfish and labyrinths were given by the Secretary, (D. Cheswright) and D. Durrant at the January meeting of the **Southend Leigh & District A.S.** Table Show results: Class B: Senior: 1, D. North; 2 and 4, C. Cheswright; 3, P. Paulks. Junior: 1, 2, 3, and 4, S. Spicer. Class Q: Senior: 1, 2 and 4, R. Smith; 3, D. North.

In February there was an FBAS Tape/Slide on Angels and the Table Show results were: Class O: Senior: 1 and 3, R. Sutton; 2, Mrs. Wood; 4, D. North. Junior: 1, 2 and 3, S. Spicer. Class EZ: Senior: 1 and 3, R. Wylie; 2, Mrs. Wood; 4, J. Wimbush. Junior: 1, 2 and 3, S. Spicer.

At the second meeting in February, slides and talk on egg-laying toothcarps were given by the Secretary (D. Cheswright) and D. Edwards (1976 president). Table Show results were: Class M: Senior: 1, R. Wylie, 2, Mrs. L. Faulks; 3, D. North; 4, K. Adams. Junior: 1, 2, 3 and 4, S. Spicer. Class C: Senior: 1, J. Wimbush; 2, T. Irwin; 3, G. Wickman; 4, R. Smith. Junior: 1, 2, 3 and 4, S. Spicer.

AT the recent annual general meeting of the **Atlantis Fishkeeping Society** the following officials were elected to office. Chairman: J. Taylor; vice-chairman: L. Cowley; secretary: G. Harvey; treasurer: Mrs. P. Taylor; librarian: S. Harvey; show secretary: R. Sutton; P.R.O.: Mr. Sutton Sn.; committee members: Mrs. Cowley; junior committee member: J. Currie. The society meets at the Methodist Church Hall, Black Bull, Aintree, and new members can be assured of a warm welcome.

DETAILS of the annual general meeting of the **Portsmouth A.S.** held in February were: chairman: J. Stillwell; treasurer: Miss W. Ryder; exhibition manager: J. Howard; vice-chairman and table show secretary: W. Ryder; social secretary: Mrs. J. Stillwell; other committee members include I. Walker, C. Forse; D. Forse; S. Morris and P. Bealey. Secretary: V. B. Hunt of "Caeglas" 120 London Road, Witley, Nr. Portsmouth, Hants PO7 5EW.

ACTIVITY at the **Ealing & District A.S.** has continued unabated into the new season. At a recent meeting one of the members, G. Biggs, gave an excellent illustrated talk on his particular collection of fishes which gave other members a chance to see some of the more uncommon species; these included many Tropical Catfishes and any other species tropical egg-layers. To round off last season's shows, the Society held a Presentation Dinner and Honorary Member Mr. H. Towell presented the trophies. The results of the Society's domestic competitions throughout 1976 were as follows:—Ankin Shield: R. Scrace, Junior Cup: Miss Dawn Cavie; Characin Shield: R. Mills, Labyrinth Shield: R. Scrace. Best Fish in closed show: J. Healey, K.O. Cup: M. Williams, Irvine Trophy: R. Scrace, Corydoras Cup: T. Cruickshank, Rasbora Cup: J. Healey, Batts Trophy (Danios): T. Cruickshank, Marsh Trophy (Guppies): Miss Dawn Cavie, Rift Valley Cichlid Trophy: M. Williams, Dwarf Cichlid Trophy: T. Cruickshank. Table Show Breeders: R. Scrace. Home Furnished (Fics'water): J. Healey. Home Furnished (Marine): D. Cavie. Mini-Furnished Tanks: J. Healey, Mills Trophy (Plants): J. Myrtle.

Closed Show Breeders: R. Mills. Novice Trophy: M. Williams.

Provisional dates for Inter-Club activities have been arranged for 7 June (home leg against Rochampton A.S.) with the away leg scheduled for 24 August.

NEW committee members of the **Huddersfield T.F.S.** are now as follow:—chairman: I. J. Bingham; secretary: D. Brock, 9 Bankfield Park Ave, Taylor Hill, Huddersfield—tel. Huddersfield 33239. Show secretary: B. Garrett, 23 Ryefields, Scholes, Holmfirth, Huddersfield.

THE **Renfrewshire A.S.** wishes to congratulate the **Scottish A.S.** on entering their Golden Jubilee year, 1927-1977 and which is still going as strong as ever.

OFFICERS elected at the annual general meeting of the **Irish Tropical Fish Society** were as follow:—president: Prof. J. N. R. Grainger, B.A., M.Sc., Ph.D.; vice-presidents: H. Wright and J. Tyrell; chairman: N. T. Bannister; secretary: Mrs. Anne Keenan, 49 Blackhorse Ave, Dublin 7; treasurer: S. Mooney; committee members: J. Dunne and J. Russell.

THREE new titles issued by the **Federation of British Aquatic Societies** in the popular "AquaTalk" series, and which are for immediate hire are as follow: No. 21—"Fish Evolution through Fossils" by Susan Turner of the Hancock Museum, Newcastle. Recorded "live" at the 1976 FBAS Convention. A fascinating insight into the "early" beginnings of our fishes. No. 24—"A.O.S. Livebearers" by Adrian Blake, Basingstoke A.S. Over 20 other livebearers under examination and No. 25—"13 Favourite Fishes" by Mervyn Strange and Adrian Blake, Basingstoke A.S.; 13 widely diverse species reviewed by Mr. Strange, from the practising Hobbyist's point of view. Breeding sequences of Corydoras, and Polycentrus species included. Titles for future release include No. 22—Non-African Cichlids, No. 23—More Killies and No. 26—Characins.

Although the Federation does strive to maintain uniformly high standards throughout these productions, the quality may deteriorate through use eventually. Similarly, slide mounts may be damaged in transit or accidentally. In the interests of all-round satisfaction, please inform the F.B.A.S. as soon as possible of any defect so that it may be rectified quickly before the next customer's booking. Ideas (offers of help even!) for new titles are always welcomed—even if they may take a little time to bring to fruition. Details of hire charges, other titles available and bookings should be obtained from K. Saxby, 3 Rowan Close, Meopham, Nr. Gravesend, Kent.

ALL members of **Accrington A.S.** would like to say a big farewell to C. H. Whitley after being secretary for twelve years. Thank you for your loyal service and we hope you enjoy your retirement and have many years of peaceful fish keeping. Mr. Whitley was presented with a watch and given life membership by Dr. Ford at our March Meeting.

RESULTS of the **Presell Tropical Fish Society** show held in February were:—Class

B: 1, R. A. J. Thomas; 2, 3 and 4, P. A. Busby; 3, R. Mayhew. Pairs: 1, P. Busby; 2, H. Rouch; 2, R. A. J. Thomas; 4, Mrs. Evans; 4, R. Mayhew. Livebearers, A.O.V.: 1 and 3, B. Locke; 2, Mrs. Coombe; 4, M. Davies; 4, J. Foster-Powell; 4, F. Stammers. Egg-layers: 1, R. Mayhew; 2 and 4, R. A. J. Thomas; 3, Mrs. Lewis.

AT the March meeting of **Bristol A.S.** S. Lloyd gave an illustrated talk on Goldfish varieties. H. C. R. Thomas spoke briefly on the problems that face water supplying authorities in that heavy chlorination may be needed to render some water fit for consumption, especially in warm weather. This meeting attracted a very good attendance that reflected the increasing membership. J. Day was elected Show Manager for 1977.

AN interesting slide show and lecture was given recently at the meeting of the **Merthyr A.S.** by G. V. Blackburn (show secretary), and enjoyed by all members present.

IN February the annual general meeting of the **Mid-Sussex A.S.** was held when the following were elected for this year. Chairman: N. Short; vice-chairman: A. Temple; secretary: B. Slade; treasurer: R. Young; show secretary: B. Burtles; committee members, C. Corbin, J. Burtles, J. Birch, D. Stone.

The club are going to hold a Fish Exhibition at the Park Centre Burgess Hill over the Whitsun weekend, and it was decided to go ahead with the "100 club" to raise funds for the club with C. Corbin as Promotor. The rules have now got to be drawn up.

Further information may be obtained from the secretary, B. Slade, "Sundown," Bolney Road, Anstyte. Phone H. Heath 53747.

CHANGES in officers of the **Newcastle T.F.S.** are chairman: D. Wilson; vice-chairman: B. Robson; treasurer: E. Smeed; secretary: T. Marshall. The four other committee members are: Mrs. L. Robson, J. Laidler, G. Dypevåg, J. English.

OFFICES elected at the annual general meeting of the **Loughborough and District A.S.** were: chairman: J. Booth; secretary: A. Onslow, 8 Garfield Road, Hugglescote, Leics. LE6 2HU. Treasurer: G. Howe; show secretary: J. Purdy; show manager: G. Taylor. Other committee members, N. Richardson, L. Somerville, A. Young, E. Young, R. Smith, S. Rowe.

The Society has a busy season ahead; starting the season off with a new **Open Show** which is to include five classes for societies in the M.A.L. (Midland Aquarist League). This will be held at the regular venue Borleigh College on 24 April a few weeks later than the annual Open Show on 5th June. Also in the year, there will be two mini furnished exhibitions and the Annual Furnished Aquarium Exhibition at John Steer House.

THIRTEEN Southern Societies' took part in the 1976 Inter-Club Show at Portsmouth and while the films (Stories from the Sea, Worms. The river must live, among the Rushes and the T.V. Chimps in Golfers progress) were being shown, the judges, C. A. T. Brown, B. Coombes, J. Jefferys and D. Lamborne dealt with the fish. Havant A.S. won the shield with 21 points, Gosport A.S. were second 18 points, Portsmouth A.S. third 14 points and Isle of Wight were fourth with 12 points. The other Societies taking part were Salisbury A.S., Kingston A.S. Rochampton A.S., Southampton A.S., Peters-

DISINFECT NEW PLANTS AND FISH WITH  **Hillside Aquatics London N12**

field A.S., Wessex A.S., Reigate and Redhill A.S., Brighton A.S., and Pisces A.S. Unfortunately a number of the clubs entered were unable to take part owing to circumstances beyond their control.

The points were allocated by Prize cards, according to the F.B.A.S. general Show Rules, and the winners of the twelve classes were: Barbs: 1, Havant; 2, Southampton; 3, Kingston; 4, Salisbury. Characins: 1, 1 of W.; 2, Salisbury; 3, Havant; 4, Roehampton. Catfish: 1, Havant; 2, Reigate and Redhill; 3, Roehampton; 4, Gosport. Cichlids: 1, Roehampton; 2, Brighton; 3, Gosport; 4, Petersfield. Danios, Minnows and Rasboras: 1, Gosport; 2, Portsmouth; 3, Havant; 4, Petersfield. Egg-laying toothcarps: 1, Wessex; 2, Portsmouth; 3, Salisbury; 4, Havant. Labyrinth: 1, Gosport; 2, Southampton; 3, Kingston; 4, Isle of Wight. Livebearers: 1, Havant; 2, Petersfield; 3, Roehampton; 4, Wessex. A.O.S. Trop: 1, Gosport; 2, Havant; 3, Southampton; 4, Isle of Wight. Singletailed Goldfish: 1, Salisbury; 2, Portsmouth; 3, Isle of Wight; 4, Petersfield. Twinstailed Goldfish: 1, Isle of Wight; 2, Portsmouth; 3, Kingston; 4, Havant. A.O.S. Cold: 1, Kingston; 2, Gosport; 3, Portsmouth; 4, Salisbury.

The date for the 1977 Inter-Club Show is 5 June at Spring Bank Holiday has been moved to June. The Clubs around the South will be notified by post as soon as the information is printed.

NEW members will be welcomed by the South East Cornwall A.S. who meet on the third Monday of each month at the Long Room, Liskeard (opposite the Carlton) at 7.30 p.m. Further details from the Secretary, Mrs. H. Byford at Liskeard 42384.

COMMITTEE members elected at the Scunthorpe and District A.S. annual general meeting were: chairman, K. Berry; secretary, N. Goodale, 8 Poplar Grove, Scooter, Gainborough, Lincs.; treasurer, P. Berry; show secretary, G. White, 26 Audern Road, Botesford, Scunthorpe, South Humberside; entertainments, Maureen Berry; advertising secretary, B. Fidell; committee member, Doris Martin.

There was a very good attendance at the February meeting of the Kings Lynn A.S. and members took part in a fish quiz. Several teams competed in a knockout and the winning team was P. Eyles, C. Simper and A. Freeman.

A bench show (o. catfish) was also arranged and this was judged by Mr. Cowell and Mr. Payne from Ily A.S. There was a very good response with nearly thirty exhibits which were divided into two classes, Corydoras and others. Results were as follows: Corydoras: 1, S. George; 2, P. Eyles; 3, Mr. Cannon; 4, Mrs. Woodhouse. Others: 1, M. Laws; 2, R. Davey; 3, P. Eyles; 4, C. Simper. Meetings are held at 8 p.m. on the second Thursday of each month at Victoria P.H., Lake Road, Lynn and visitors are always welcome.

CHANGES in officers at Harlow A.S. are as follows: chairman, R. Kerridge; vice-chairman and P.R.O., M. S. Smith; secretary, J. Duncan, 246 Spinners Croft, Harlow, Essex, Phone: Harlow 28346; show secretary, S. Cartell, 185 Brockles Mead, Harlow, Essex; social secretary, J. Curtis; treasurer, L. Hayes. Meetings are held fortnightly at Potter Street Community Centre, starting at 8.00 p.m. to 10.30 p.m. on the following dates: 13 April; 27 April etc. The open show will be held at Moot Hall, The Stow, Harlow, on Sunday 11 September.



**A TABLET
A DAY, SENDS
WHITE SPOT AWAY**

Hillside Aquatics London N12

OPEN Show results of Sheaf Valley A.S. were as follows: Guppies: 1, Mr. and Mrs. Welsh (York and District); 2, Mrs. Y. Lee (Chesterfield); 3, Mr. and Mrs. Moore (Sheaf Valley). Mollies: 1, Mr. and Mrs. Smith (Scunthorpe and District); 2, Mrs. L. Greenwood (Immingham); 3, Mr. and Mrs. Newsome (South Humberside). Swordtails: 1, Mr. and Mrs. L. Fletcher (Doncaster); 2, Mr. and Mrs. Holmes (Castleford); 3, N. Breenkin (Bradlington). Platies: 1, C. Carrick (Castleford); 2, Mr. and Mrs. Walsh (York and District); 3, M. Simons (Immingham). A.O.V. Livebearer: 1, Mr. and Mrs. Dawes (Doncaster); 2, Mr. Gattenby (Bradford); 3, Mr. Shields (Halifax). Small Anabantids: 1, Master I. Toyne (Sheaf Valley); 2, T. Tideswell (Grimsby and Cleethorpes); 3, Mr. and Mrs. Holmes (Castleford). Large Anabantids: 1, Mr. and Mrs. Feasey (Doncaster); 2, T. Tideswell (Grimsby and Cleethorpes); 3, Mr. and Mrs. Berry (Scunthorpe and District). Figherts: 1, Mr. and Mrs. Newsome (South Humberside); 2, A. Cook (Retford); 3, W. Hunt (Thorne). Corydoras: 1, F. Seal (Sheffield); 2, Mr. and Mrs. Holmes (Castleford); 3, Mr. and Mrs. Muckle (Southport). A.O.V. Catfish: 1, Mr. Sanerson (Thorne); 2, Mr. Ely (Castleford); 3, C. Carrick (Castleford). Loaches and Bettas: 1, J. Cornforth (Bradford); 2, Mr. and Mrs. Daines (Doncaster); 3, J. Sanerson (Thorne). Small Barbs: 1, Mr. and Mrs. Holmes (Castleford); 2, Mr. and Mrs. Blades (Bassetlaw); 3, Mr. Price (Castleford). Large Barbs: 1, W. Neville (Grantham); 2, Mr. and Mrs. Copley (Doncaster); 3, A. Grafton (Sheffield). Small Characins: 1, Mr. and Mrs. Chamberlain (Leamington and District); 2, Mr. and Mrs. Binns (Scunthorpe Museum); 3, Mr. and Mrs. Richmond (Retford). Large Characins: 1, Mr. Kilvington (Doncaster); 2, H. Thorpe (Doncaster); 3, B. Sleight (Mexboro). Carps and Minnows: 3, Master S. White (Retford). Danios and Rasboras: 1, Mr. Piggott (Grimsby and Cleethorpes); 2, Mr. and Mrs. Lake (South Humberside); 3, Mrs. Toyne (Sheaf Valley). Dwarf Cichlids: 1, Mrs. Singleton (Darfield); 2, Marsh and Ludlam (Dearne); 3, W. Jordan (South Humberside). Large Cichlids: 1, P. Northrop (Hull); 2, Mrs. Berry (Scunthorpe and District); 3, Mr. and Mrs. Mangle (Retford). Rift Valley Cichlids: 1, C. Carrick (Castleford); 2 and 3, P. and J. Warratt (Caerphilly). Angels: 1, Mr. and Mrs. K. Welsh (York and District); 2, Mr. and Mrs. Blades (Bassetlaw); 3, Mr. and Mrs. Richmond (Retford). A.O.V. Tropical: 1, Mr. and Mrs. Copley (Doncaster); 2, Mr. and Mrs. Holmes (Castleford); 3, W. Harris (Mexboro). Sharks and Foxes: 1, T. Sanerson (Thorne); 2, W. Hunt (Thorne); 3, Mr. and Mrs. Campbell (Scunthorpe and District). Toothcarps: 1, F. Seal (Sheffield); 2, B. Sleight (Mexboro); 3, Mr. and Mrs. Morrissey (Immingham). A.V. Female: 1, Mr. and Mrs. Blades (Bassetlaw); 2, Master S. White (Retford); 3, Master Lake (South Humberside). Pairs: Livebearers: 1, Mr. Gattenby (Bradford); 2, Mr. and Mrs. Daines (Doncaster); 3, Mr. Price (Castleford). Pairs Egg-layers: 1, Mr. and Mrs. Muckle (Southport); 2, Mr. and Mrs. Riley (Castleford); 3, Mr. Duncan (Hull). Breeders (Livebearers 1-10): 1, A. Piggott (Grimsby and Cleethorpes); 2, J. W. Balderstone (Grimsby and Cleethorpes); 3, H. Thorpe (Doncaster). Breeders (Livebearers 11-20): 1, Mr. and Mrs. Campbell (Scunthorpe and District); 2, Mr. Shields (Halifax); 3, T. Busfield (Barnsley). Breeders (Egg-layers 1-10): 1, B. Jackson (Doncaster); 2, Marsh and Ludlam (Dearne); 3, Mr. and Mrs. Campbell (Scunthorpe and District). Breeders (Egg-layers 11-20): 1, C. Carrick (Castleford); 2, Master S. White (Retford); 3, P. and Y. Watts (Caerphilly). Goldfish and Comets: 1, Mrs. Waller (Rochester); 2 and 3, K. Chapman (Mexboro). Fancy Goldfish: 1, J. and D. Greenwood (Swillington); 2, Mr. and Mrs. Hopkinson (Darfield). A.O.V. Coldwater: 1, Mr. and Mrs. Blades (Bassetlaw); 2, N. Breenkin (Bradlington); 3, W. Jordan (South Humberside). Mini-Jars: 1, Mr. Shields (Halifax); 2, A. Cook (Retford); 3, Mrs. C. Toyne (Sheaf Valley). Plants: 1, 2 and 3, Mr. Kilvington (Doncaster). The Best Fish in Show Award was won by Mr. and Mrs.

Blades from Bassetlaw Society with a Sun Bass. Best Exhibit C. Carrick from Castleford with Breeders. Society with most points, Doncaster.

A recent publicity campaign has brought renewed interest in fishkeeping in the Bracknell area, so much so that the Bracknell A.S. are moving to a new, larger clubroom at The Market Inn, Station Road, Bracknell from 14 March. Meetings will still be held on the second and fourth Monday in the month at 8 p.m.

In February, A. Gibson gave an excellent talk on setting up furnished aquaria which was greatly appreciated by all the new members. A table show was held and won by L. Jones. For more details on the society ring Winkfield Row 4596 evenings.

THE Ichiban Ranchu Society announce the First National Ranchu Show, to be held at Seymour Hall, Seymour Place, Westminster, London on Saturday 1 October. This is believed to be the first open show ever staged for one variety only of Fancy Goldfish in the United Kingdom.

Engraved Coats and Award Cards will be presented for all class placings, plus Special Awards. Judging panel to be announced later. The Society would like to thank the Bonsai Kai of Japan Society of London for the display of Bonsai trees which they are going to stage at this show, also Mr. David Tisbury for the display and pool of Koi which he is providing.

Licensed Bar and Restaurant will be open all day and full details and schedules are available from the Show Secretary, F. Hilton, 5 Woolmers Mead, Pleshey, Chelmsford, Essex, or telephone Bishop's Stortford 870395.

NEW officers for the Nailsea and District A.S. for this year are as follows: chairman, W. Holland; vice-chairman, P. Fichetti; secretary, M. J. Illick, 3 Burrington Close, Nailsea, Bristol, Phone Nailsea 4158; treasurer, B. Billinger; programme officer, D. Kenwood; publicity officer, P. Sharcott; committee, I. Dibble, C. Brewer. Meetings are held on the fourth Tuesday of each month, all will be welcome. Details can be obtained from the secretary.

THERE was a good attendance at the February meeting of the C.N.N.A. 100 members were present and eleven societies represented. The main class of the evening was barbs, with the first place going to P. Burton of Aberdare A.S., A. Hillman, L.M.A.S. being second. J. Edwards, L.M. was third and the fourth position went to R. Brown, B.G.F.C. In the K.O. results for livebearers, the placings were: 1, P. Dewland, R.A.S. and egg-layers: 1, J. Egan, P.T.D.A.S.

OFFICERS elected at the Annual General Meeting of the Goole and District A.S. for this year were: chairman, D. Newby; secretary, Miss M. Coates, 8 Hull Road Howden; Goole DN14 7AH. Treasurer: R. Carr; show secretary: P. Hurton, 9 Hood Grove, Goole. Programme secretary: R. Pullan; catering secretary: Mrs. M. Shipley.

AT the first February meeting of the Walthamstow and District A.S. over thirty members heard a lecture by Mr. Gordon Howes on Fish Anatomy. Over one hundred slides were shown and everyone agreed that it was a very interesting and informative evening. For the second meeting of the month members enjoyed a Tape-Slide lecture on plants by Mr. Pye. Meetings are held on the first Friday and third Wednesday each month at the Grange Community Centre, Frederic Street, E17, or Telephone the secretary, G. Smith, 01-527 6303.

THERE was a large attendance at the New Forest A.S. February meeting including seven visitors, when two club members, B. Higginson and T. Jefferies demonstrated how to make an all glass aquarium. Much interest was shown in the making of small show tanks for single

fish entries on the show bench, at 4 in. x 4 in. show jars are now almost unobtainable.

During the interval junior members organised a raffle, and there was an auction of fish, plants, and aquarium accessories. **Table Show Results:** Corydoras Catfish; 1 and 4, T. Jeffries; 2, C. Head; Damio; 1 and 2, P. Wheeler; Fry; 1, Mrs. Stokes; 2, P. Wheeler; 3, and 4, P. Norup. Intending new members are always welcome at meetings on third Monday each month, at the "Community Centre," New Street, Lymington, Hants.

DURING the February meeting, **Llantwit Major A.S.** were host to **Port Talbot A.D.A.S.**, **Rhondda A.S.** and **Dow Corning A.S.** in a four-way inter-club competition for the **Glanafon Perpetual Trophy**. This will be competed for at six monthly intervals. A total of 142 fish were benched comprising 87 egglayers and 55 Livebearers. The result was as follows: Competition Proper: Egglayers: 1, H. Chick (L.M.A.S.); 2, J. Egan (P.T.A.D.A.S.); 3, E. A. Hillman (L.M.A.S.); 4, R. Perkins (P.T.A.D.S.); 5, M. Williams (R.A.S.). Livebearers: 1, D. Potter (Dow Corning); 2, A. Ibberson (L.M.A.S.); 3, C. Morris (P.T.A.D.A.S.); 4, W. Evans (R.A.S.); 5, M. Bowles (R.A.S.). Result: L.M.A.S. 15 pts, P.T.A.D.A.S. 12 pts, R.A.S. 8 pts, Dow Corning 7 pts. K.O. Egglayers: 1 and 2, J. Edwards (L.M.A.S.); 3, H. Chick (L.M.A.S.); 4, Mr. and Mrs. M. C. Gurbrie (L.M.A.S.); J. Dunn (P.T.A.D.A.S.). Livebearers: 1 and 4, A. and M. Smith (R.A.S.); 2, C. Morrison (P.T.A.D.A.S.); 3, G. Lewis (L.M.A.S.).

CHANGES of officers for **Halesowen and Hadon A.S.** are: chairman, M. Newby; vice-chairman, F. Swift; treasurer, D. Westall; show secretary, K. Swift; assistant show secretary, T. Talley; secretary, Mrs. W. Crampton, 18 Bourne Crescent, Halesowen, West Midlands, Phone 021-550 9360.

Meetings are held on the first Monday of every month at Halesowen British Legion, Otterbourne Court, Bundle Hill, Halesowen. New members are assured of a warm welcome.

RECENT meetings of the **Portsmouth A.S.** have included two excellent F.B.A.S. tape slide lectures. The first, Ian Sedlick's 'Fish Coloration and Communication' was very educational and, as a number of members commented, one of the best they had seen. For pure interest Cliff Harrison's 'Beach-combing' took some beating. All the marine animals were excellently photographed and is a great incentive for anyone wishing to start native marines. Other meetings this year have included the annual general meeting and a picture quiz arranged by Mr. Stillwell and Mr. Hunt which was enjoyed by all despite a mishap with the projector.

THE North West Lancs./Manchester Section of the **Fancy Guppy Association** is taking part in a four day hobbies exhibition run by Preston Lions in the Guildhall, Preston from 27 to 30 April. There will be 55 hobbies on show. Members won seven awards, including two first prizes at the 1976 Berlin International Show.

AT the annual general meeting of the **Heywood and District A.S.** the following committee was elected: chairman, Mrs. P. Ridley; secretary, S. Wolstenholme, 185 Smithy Bridge Road, Littleborough, Lancashire OL15 0BD; treasurer, T. E. Davies; show secretary, J. Ridley, 53 Miller Street, Heywood, Lancashire; P.R.O./Editor, R. Dingley; junior section supervisor, H. Warburton. All correspondence relating to shows or showing should be sent to the show secretary and all other matters will be dealt with by the secretary.

A NUMBER of lectures and slide shows are in the process of being arranged by the **Tottenham and District A.S.** for the coming year, and a visit to **London Zoo** Aquaria behind the scenes is also being arranged. Meetings are held at 101 Stan Road, Tottenham, on the

second and fourth Thursday in the month. New members can be assured of a warm welcome.

A FRIENDLY table show and quiz was held in February when **Oxley and District A.S.** were hosts to **Rugeley A.S.**. Mr. Paul Massey made an excellent job of judging the four classes and the results were: Barbs: Mr. K. Swann (Rugeley). Cichlids: F. and S. Whitehouse (Oxley). Characins: Mr. D. Lunn (Rugeley). Catfish: F. and S. Whitehouse (Oxley). Best Fish in Show went to Mr. K. Swann. Rugeley were two points better in the quiz and S. Whitehouse gave an excellent talk and slide show on the Rift Lake Cichlids.

THE **Loughborough and District A.S.** had a very informative and enjoyable evening at Petfoods earlier in the year. They were met by Dr. Ford and shown around his laboratory in which there were a large number of tanks of tropical and coldwater fish. A film on how the company's fish food was made was also shown.

The first table show of the year was held at the end of February, the classes and winners being: A.V. Anabantid: G. Taylor, A.V. Leach; J. Booth (Best in Show). Livebearer Broods: A. Onalow. Egglayer Pairs: A. Onslow. During the evening a quiz was organised by Mr. and Mrs. Young.

IN February the **Hastings and St. Leonards A.S.** meeting had R. Mills talk on 'Filters' a subject always guaranteed to encourage a long and often heated discussion. Also in February Barry Funnell gave one of his excellent talks this time on Labyrinthia. As usual, experienced as well as novice fishkeepers learned a great deal.

Anyone wishing to join the society or just making a holiday visit should contact the Secretary, P. Martin, 20 Silverlands Road, St. Leonards-on-Sea, Sussex.

OFFICIALS elected at the annual general meeting of the **Heywood and District A.S.** were as follows: chairman, Mrs. P. Ridley; secretary, S. Wolstenholme, 129 Smithybridge Road, Littleborough, Lancashire; treasurer, T. E. Davies; show secretary, J. W. Ridley; P.R.O., R. N. Dingley. Meetings are now held every first and third Monday in the month at the Joiners Arms, Hornby Street, Heywood.

A SLIDE show and lecture was given by the president of **Hull A.S.**, Mr. R. Willerton, to club members recently. From his stock of slides he chose a good mixture of plants, fishes, fish-house and an outdoor pond he constructed himself. Mr. Willerton also showed slides of Chester Zoo which were particularly interesting as some Hull members are going to visit Chester Zoo soon. He also related his experiences of photography with which he has experimented with for the benefit of anyone wishing to take up this branch of the hobby.

Recently members travelled to **Scarborough A.S.** for the purpose of a friendly match. Although only six Hull A.S. members exhibited a good contest was given. Scarborough gained 208 points and Hull 158 points. There were 24 classes and the fish were judged by Mr. E. Stanton and Mr. E. Smith. Best Fish in Show went to Mr. A. Fruby (Hull). The return fixture will be at Hull later in the year.

THE committee elected at the **Oldham and District A.S.** annual general meeting was: chairman, A. Jump; vice-chairman, Mrs. E. Wilkinson; secretary, E. Birchwood, 4 Hill Top Healds Green Chadderton, Oldham; treasurer, Mrs. E. Brunt; show secretary, A. Chadwick.

The Society is looking forward to a very interesting and varied year which will include lectures, slide shows, quiz's, auctions table shows and open discussions. New members can be assured of a warm welcome. Meetings are held fortnightly Monday evenings at the Federation of Ukrainians, 96 Waterloo Street,

Oldham at 8.00 p.m. It was a very special occasion for the club as Mrs. E. Brunt became the Society's first honorary member having served the club as treasurer for the past 26 years.

JUDGES COURSE

The **Midland Association of Aquarist Societies** are holding a judges course at the Fordhouses and Oxley community Centre, Marsh Lane Wolverhampton, beginning Sunday the 24th April and continuing for eight weeks, from 3.00 p.m. till 6.00 p.m. each Sunday afternoon. Examiners are Mr. P. Massey, Mr. R. Tedds and Mr. D. Johnston. Further information can be obtained from Mr. F. Whitehouse, 68 Oak Park, Goddall Wolverhampton, Staffs. Tel.: Goddall 3834.

MARINE NEWS (B.M.A.A.)

In the February issue of the **Aquarist and Pondkeeper** I was very pleased to see Mr. D. S. Bunn's article on native marines (a term which I prefer to use to coldwater marines as it specifies marines indigenous to our own coast). There are a surprisingly large number of aquarists who are keeping fish and invertebrates from our own coastline, including people who live many miles inland. As we are now approaching warmer weather many aquarists will be making their annual pilgrimage to the coast in order to collect a fresh stock of specimens for their tanks.

Perhaps now is a good time to point out a few rules for the successful collecting of native marines. The first of these is to check up the times of low tide before setting off for the coast. It is amazing how many aquarists travel many miles hoping that the tides will be right only to find all the best collecting sites covered by water. Times of high tide are usually given in the local paper and low tides are six hours either side of this. Harbour authorities can also supply the times of tides and also the height of high tide. The higher the high tide is the lower will be the low tide. To allow plenty of time for collecting arrive at least an hour before low tide.

Once at the collecting site work along the shore in a systematic manner. Most of the interesting and unusual specimens will be found lower down on the shore and I have found it best to work across the shore keeping close to the sea so that as areas are uncovered by the receding water they can immediately be examined. Rocky shores give the best hunting grounds but as Mr. Bunn mentioned in his article, rock pools are not the only source of specimens. Many will be found under seaweed or under rocks. If you move rocks or seaweeds then please make sure that they are returned to their original position as many sessile creatures live underneath which will perish when exposed to the air.

There is a wealth of variety to be found on our own seashores so perhaps this Summer a few more marine aquarists will have a go at keeping native marines.

One final piece of news this month. After the publication of the January **Aquarist and Pondkeeper** in which there was an advert for Aquarist fishfood featuring the B.M.A.A. and also the first **Marine News**, the Association Secretary received letters from over 150 aquarists requesting information about membership. Many of these have now joined but anyone else wishing information about the B.M.A.A. should contact the Secretary, John Vickery, 26 Rosalind Avenue, Dudley, West Midlands, DY1 4JW, G. C. Robertson.

MISSING TROPHIES

The **Weymouth A.S.** are anxious to trace

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some of their trophies which appear to be missing from their last open show in 1973. The Perpetual Cups missing are: Bond Cup for Best Breeders won by C. Turner; Restorick Cup for Best Catfish won by M. Chad; Bennett Cup for Coldwater won by R. Davis; and Preston Aquaria for Sexed Pairs won by K. Forrester.

NEW SOCIETY

The **Dorchester Tropical Fish Society** was formed on the 28th January. Meetings will be held at the W.I. Hall, Durrant Street, Dorchester, on the last Thursday of each month at 7.30 p.m. New members welcome from all areas. Details from D. R. Young, Secretary, 42 Wessex Road, Dorchester, Dorset.

VENUE CHANGE

THE **Medway A.S.** now meets at the East End (near Luton Arches) every second and fourth Wednesday in the month. Secretary, K. Grubb, 66 Norman Close, Gillingham, Kent ME8 0TQ. New members welcome.

THE **Bracknell A.S.** have moved to a larger clubhouse at The Market Inn, Station Road, Bracknell.

MEETINGS of the **Newcastle T.F.S.** are now held at The New Darnell (upstairs) Newcastle.

THE **Smethwick and District A.S.** are now meeting at the Robinson Cross public house, Suffrage Street, Smethwick, Warley, West Midlands, on alternate Wednesdays at 8 p.m. Anyone interested may ring W. Timmins (Hon. Sec.) on 021-558 8454 for further details.

SECRETARY CHANGES

Rhondda A.S.: W. Evans, 18, Brook Street, Williamstown, Rhondda, Mid Glam.

Leamington and District A.S.: F. Stoodley, 4 St. John's Terrace, Leamington Spa, Warwickshire CV31 3BJ.

Stanley A.S.: A. Howgate, 20 Provident Street, Pelton Lane Ends, Chester-le-Street, Co. Durham. Tel: Beamish 700889.

Huddersfield T.F.S.: D. Brook, 9 Bankfield Park Avenue, Taylor Hill, Huddersfield. Tel: Huddersfield 33269.

Halesowen and Haden A.S.: Mrs. W. Crampton, 18 Bourne Crescent, Halesowen, West Midlands. Tel: 021-550 9320.

Streetsford and District A.S.: I. Brown, 18 Royston Court, 72/74 Carlton Road, Manchester 16.

South Humberside A.S.: The new Show Secretary is D. Hill, 56 Harold Street, Grimby, South Humberside DN32 7NB.

SHOW CANCELLATION

SINCE announcing the date of their Open Show, the **Whiteway and District Fishkeepers Society** and **Bath Aquarists** have arranged their show for the day previous and therefore regret they have no alternative but to cancel. Apologies to all concerned. The Society thanks all aquarists for their support in past years. Mrs. E. Daniels (Show Secretary).

AQUARIST CALENDAR

2nd April: Catfish Association of G.B. Annual Open Show at St. Saviour's Church Hall, Cobbold Road, London, W.12. Schedules and further details from show secretary, Mr. D. Lambourne, 7 Wheeler Court, Flogh Road, London, S.W.11. Tel: 01-223 2630.

2-3rd April: **Aberdeen A.S.** Open Show, Music Hall, Union Street, Aberdeen. Full details and Entry form from J. Gibson, 35 Redness Road, Aberdeen.

3rd April: **Scunthorpe Museum Society** Open Show at Charter Hall, Corporation Road, Scunthorpe. Schedules available from Show Secretary, D. Caldwell, 5 St. Martins Road, Scawby, Brigg, South Humberside DN20 9BG.

3rd April: **Malvern and District A.S.** Fourth Open Show at Barnards Green Cricket Club, Netherend Lane, Malvern. Note new date and more classes. Schedules from Show Secretary, Mr. G. W. Roan, 6 Chester Place, Malvern, Worcs. Tel: Malvern 64386.

3rd April: **Malvern and District A.S.** Open Show. Details from G. W. Roan, 6 Chester Place, Malvern, Worcs.

10th April: **Stockton-on-Tees A.S.** will hold their Annual Show at Kiara Hall, Roseworth, Stockton-on-Tees at 2 p.m. Benching 11 till 1.45. Schedule available from R. Wood, 67 Victor Way, Thornaby. Tel: Stockton 762297. (Please note new telephone number).

15th April (Easter Sunday): **Hyde A.S.** Annual Open Show will be held at Hattersley Community Centre, Hattersley Road East, Hattersley, Hyde, Cheshire. All aquarists are invited to enter their exhibits in the competitive sections. Eight F.N.A.S. judges. Show schedules and further details from the show secretary, L. Haycocks, 24 Fountain Street, Godley, Hyde, Cheshire. Tel: 061-366 0777.

11th April: **Easter Monday Southampton A.S.** Open Show at The Avenue Hall, The Avenue, Southampton. Details from Show Secretary, Mrs. J. Vincent, 38 Rosington Avenue, Birtane, Southampton.

15th April: **Yate and D.A.S.** Eleventh Open Show will be held at Christ Church Hall, Downend, Bristol, Avon. Schedules (available from 1st March 1977) from Mr. R. A. Bennett, 22 Kents Green Kingswood Bristol, Avon.

17th April: **Walthamstow and District A.S.** Annual Open Show at Mission Grove School Annex, Warner Road, Walthamstow, London E17. Show Secretary: W. Wiegold, 5 Nelson Road, Bishop's Stortford, Herts.

17th April: **Nelson A.S.** Annual Open Show at the Civic Centre, Stanley Street, Nelson. Details from R. McKenna, 52 Bath Street, Nelson, Lancs BB9 0NP.

17th April: **Taunton and District A.S.** Open Show will be held at Coedfield Hall, Taunton, Somerset. Schedules available from show manager, M. Bray, 11 Whitehall, Taunton, Somerset TA1 1PG.

17th April: **Coventry P. and A.S.** Annual Open Show at Templars Junior School, Tile Hill Lane (left from A45 at Godiva Cinema), Coventry. Tropical, coldwater and koi classes. Schedules from show secretary, T. Emma, 79 Edward Road, Coventry. Tel: Coventry 413252.

17th April: **Walthamstow and District A.S.** Open Show. Details from show secretary, W. Wiegold, 5 Nelson Road, Bishop's Stortford, Herts. Tel: 0279 56843.

17th April: **Half Moon A.S.** Open Show will be held in the Co-op Hall, Belasis Lane, Billingham, Cleveland. Details from show secretary, C. W. Buck, 22 Danby Grove, Thornaby, Cleveland TS17 8BX. Tel: Stockton 65284.

19th April: **Aireborough and District A.S.** Spring Mini Show at Greenacres Hall, New Road Side, Rawdon, Nr. Leeds. Schedules from G. E. Cuff, 31 Oakdale Drive, Bradford, W. Yorks. BD10 0JP. Tel: Bradford 632424.

23rd April: **Rhondda A.S.** Open Show will be held at the Rhondda Transport Club, Porth. Entry fees by post 5p, on day 10p. Entry forms from show secretary A. Smith, 12 Glasson Street, Penyarth, Rhondda, Glam.

24th April: **Mount Pleasant A.S.** Annual Open Show at Venerable Bede Church Hall, Woodworth Street, Sunderland Road End, Gateshead. Schedules from R. Kirkup, 8 Broadway, Sheriff Hill, Gateshead NE9 5PX.

24th April: **Loughborough and District A.S.** are the hosts for the first Midland Aquarists League Show of 1977 at Burleigh College, Thorpe Hill, Loughborough. There are also a number of Open Classes. Schedules from I. S. Purdy, 10 Cleveland Road, Loughborough, Leics. LE11 2SP.

24th April: **Bikborough A.S.** Open Show. Further details later.

24th April: **Gosport and District A.S.** Annual Open Show at Stubbington Community Centre, Stubbington, Hants. Show Secretary—M. Pirie, 15 Wakefield Avenue, Fareham, Hants. Tel: Fareham 5169.

24th April: **Mount Pleasant A.S.**, intended Open Show, venue to be fixed. Schedules later from R. Kirkup, 8 Broadway, Sheriff Hill, Gateshead NE9 5PX.

24th April: **Reigate and Redhill A.S.** Open Show at Blethingly Village Hall. Schedules: M. Sandford, 5 Victoria Road, Redhill. Tel: Redhill 69399.

24th April: **The Yeovil and District A.S.** will hold their annual open show at the Village Hall, Martock, Somerset.

24th April: **York and District A.S.** Open Show at Livestock Centre, Muroo, York. Benching 12 noon to 2 p.m. Details from Show Secretary, A. Sykes, 59 London Street, Pocklington, York YO4 2JW.

30th April: **Bristol Tropical Fish Club** Open Show at the Congregational Church Hall, Newton Street, Stapleton Road, Bristol. Tropical and Coldwater Classes (Including Koi). Schedules and further details obtainable from the Show Secretary, Mrs. B. Pedersen, 22 Vincent Close, Lawrence Weston, Bristol. Phone Avonmouth, Bristol 82-8062.

1st May: **Hull A.S.** Open Show, Blind Institute, Beverley Road, Hull. Schedules available from G. Andrews, 4 Church Mount, Spoutley, Hull. Tel: Hull 811334.

1st May: **Open Show Blind Institute Beverley Road, Hull.**

1st May: **Havant and District A.S.** 7th Open Show to be held at The Herodias Community Centre, Merchiston Hall, Portsmouth Road, Horndean. Schedules: H. Armitage, 74 Park House Farm Way, Leigh Park, Havant, Hants. Tel: Havant 73192.

1st May: **Oram A.S.** Open Show at the Oram Social Club Hall, Refuge Street, Shaw, Oldham.

1st May: **Newcastle Guppy and Livebearer Society** International Livebearer Show, Cradock Park Community Centre, Newcastle 4. For further details of the show please contact Mrs. J. Renton, 146 Chillingham Road, Heaton.

7th May: **The Port Talbot A.S.** "Open Show" will be held at "The Talbot County Youth Centre," Meargum Road, Port Talbot, West Glam. Ample parking space is available. Trophies, Plaques and Cards for all Classes. Postal Entries 5p, per entry, on Show day 10p per entry. Show Secretary, A. E. B. Foursacre, 3 Cross Street, Velindre, Port Talbot, West Glam, SA13 13 IAE.

8th May: **Stanley A.S.** Annual Show at Stanley Youth Centre. Schedules from A. Howgate, 20 Provident Street, Pelton Lane Ends, Chester-le-Street, Co. Durham. Tel: Beamish 700889.

8th May: **Bolton Gunners A.S.** First Annual Open Show.

8th May: **Bournemouth A.S.** Annual Open Show to be held at Kinross Community Centre, Pelhams Park, Kinross, Bournemouth. Show Schedules and further information from J. V. Jeffery, 30 Braemar Avenue, Bournemouth, BH6 4JF, Dorset, Tel: Bournemouth 47323.

8th May: **Warrington A.S.** Annual Open Show. The venue will be the Parr Hall, Palmira Square South, Warrington, G. Millman, show secretary, 101 Loushers Lane, Warrington, Cheshire WA4 2RP.

8th May: **Aireborough and District A.S.** Open Show, Merston Civic Centre, Main Street, Merston, Nr. Leeds, W. Yorks. Schedules from G. E. Cuff, show secretary, 31 Oakdale Drive, Bradford, W. Yorks. BD10 0JP. Tel: Bradford 632424.

14th May: **Southend, Leigh and District A.S.** Open Show at St. Clement's Hall, Leigh-on-Sea, Essex. Further details will be available in due course from A. Smith, 39 Willow Walk, Hadleigh, Essex, Tel: Southend 555540.

15th May: **Goole and District A.S.** Annual Open Show. Details from Miss M. Coates, 8 Hull Road, Howden, Goole, N. Humberside DN14 7AH.

15th May: **Gloucester A.S.** Open Show will be held at the Chequers Bridge Leisure Centre, Barton Street, Gloucester. There will be 32 classes in all. Trophies for 1st and 2nd, prizes for 3rd and 4th, plus award cards. Schedules will be available from March onwards from Mr. D. Parry, Secretary, 49, Oxstalls Way, Longlevens, Gloucester.

15th May: **The Wynnistay A.S.** are holding their first open show this year in the George Edwards Hall, Cefn Mawr, Nr. Wrexham, North Wales.

15th May: **Trowbridge and District A. and P.S.** Annual Open Show will be held at the Bradford-on-Avon Rowing Club. Judging will be to P.B.A.S. standards. Show schedules can be obtained from April onwards from S. J. Bowers,

show secretary, 13 Dean Close, Melkham, Wilts. SN12 7EZ.

21st May: Merthyr A.S. second Open Show to be held at the Catholic Hall, Georgetown, Merthyr Tydfil. For further details please contact G. V. Blackburn, 5 Palm Road, Gurnos Estate, Merthyr Tydfil.

22nd May: Merseyside A.S. Annual Open Table Show will be held at the Rainhill Village Hall, Rainhill, Lancs. Hon. secretary, J. Bailey, 11 Auburn Road, Liverpool L13 3BJ.

22nd May: Rotherham and District A.S. Open Show at the Town Hall Assembly Rooms, Rotherham. Benching 12.00 noon till 2.00 p.m. Details from show secretary, J. Stanton, 26 Gerard Road, Rotherham, South Yorkshire, S60 2QP. Tel: Rotherham 66716 or 70569.

22nd May: Fancy Guppy Association Annual National Open Guppy Show to be held at the Glebe Farm Community Centre, Glebe Farm, Stechford, Birmingham. 37 guppy classes including F.G.A. British Open Championship. Lecture, exhibits, refreshments. Show schedules from C. Beer, 6 Pedmore Close, Woodrow 5ruth, Redditch.

28th May: Cheltenham Open Show at St. Marks Community Centre, Brooklyn Road, Cheltenham. Show schedules from M. Jenkins, 3 Marlborough Place, Princes Street, Cheltenham.

28th May: Cardiff A.S. Open Show at St. Margaret's Hall, Waterloo Road, South, Cardiff. Show secretary, D. Brown, 4 Deepener Gardens, Riverside, Cardiff CF1.

28th May: British Aquarists' Study Society Second Spring meeting at 2 p.m. in the Meeting Rooms of the London Zoological Society, Regents Park, London, N.W.1. "Carnishes", a series of talks illustrated with colour slides. Tickets £1 from the Treasurer, W. Goodwin, 14 Dawlish Drive, Devon Park, Bedford.

28th-29th May: Kings Lynn A.S. Exhibition and Fair at North Runton Scout H.Q. Near Kings Lynn. Further details to Mrs. S. George, 29 Peppers Green, Kings Lynn. Tel: 671610.

28th May: Middleton and District A.S. 6th Open Show. Two shows in one! Tropical Section: 34 Classes. Coldwater Section: 11 Classes. At the Civic Hall, Middleton (M.62—Exit 19).

28th May: Corby A.D.A.S. Silver Jubilee. Open Show 30 classes. Civic Centre Corby. Show secretary, D. A. Page, Nutcracker Cottage, 14 Meeting Lane, Burton Latimer, Northamptonshire, NN15 5CS.

29th May: Redcar's Fifth Annual Open Show held again at Coatham Bowl, Redcar. Details Redcar 74599.

29th May: Bridlington and District A.S. Annual Open Show, at the Hilderthorpe Junior School, Bridlington. Show schedules available from M. Jordan, 86 Matton Road, West Hill Estate, Bridlington, N. Humberside.

28th May: Corby and District A.S. Open Show at Corby Civic Centre, George Street, Corby, to celebrate our Silver Jubilee. We offer engraved trophies in each class in a comprehensive schedule, plus many other perpetual trophies. S.A.E. for schedules to: D. Page, 14 Meeting Lane, Burton Latimer, Kettering, Northants.

4th June: Weymouth A.S. Open Show at St. Aldhelm's Church Hall, Radipole. Secretary Mrs. J. Dowell, 37 Sussex Road, Weymouth DT4 0PL.

4th June: Weston-Super-Mare Tropical Fish Club Open Show at St. Johns House, Gaford Street, Weston-Super-Mare, Avon. Show secretary, Mr. and Mrs. M. Raymond, 1 The Coombe, Burringpen Blagden, Near Bristol.

5th June: 1977 Inner-Club Show (Portsmouth A.S.).

5th June: Loughborough and District A.S. Open Show.

5th June: Thorne A.S. Open Show at the Fieldside Junior School, Fieldside, Thorne, Doncaster. For further details please contact the show secretary, B. Banks, 75 Marshland Road, Moeccenda, S. Yorks. DN8 4SY.

11th June: Llanrwst Major A.S. Open Show. Schedules available April onwards from J. J. Edwards, "Glamafon", Mill Park, Llanberis, Cowbridge, South Glam. CF7 7BG.

12th June: Newcastle Tropical F.S. Open Show will be held at Cradock Park Community

Centre Westmoorland Road, Newcastle upon Tyne. Further details of the show can be obtained from the Show Secretary T. Marshall, 488 Elliswick Road, Newcastle upon Tyne.

12th June: Salisbury and District A.S. Annual Open Show. Further details and show schedules from R. P. Adams, 26 Empress Road, Salisbury, Wilts.

12th June: Boston A.S. Open Show, Kirwood Girls School, Robinhoods Walk, Boston. Schedules from secretary, Mrs. M. Sandi, 20 Argyll Street, Boston, Linco. PE21 8PH.

12th June: Sudbury A.S. Open Show at the Waags Rugby Ground, Repton Avenue, Wembley. Schedules from I. J. Brazier, 69 Ormsby Way, Kenton, Middlesex. Tel: 01-264 5374.

18th June: Bath A.S. Open Show at Pitmans Press, Bath.

19th June: Redditch Open Aquatic Show. Incorporating the International Herpetological Society Show. It is a knock-out (Redditch Firms) Fair, Bar and Catering. Organised by Nelson A/S at the Abby Sports Stadium, Eppingham Road, Redditch, Worcs. Details: Mr. P. J. Binley, 25 Plyford Close, Lodge Park, Redditch, Tel: Redditch 26568 Evenings Only.

19th June: Swillington A.S. Open Show. Schedules available from P. Campling, 4 Edinburgh Place, Garforth, nr. Leeds. Tel: 88605. Mini-Show on the 15th March.

19th June: North West Lancs./Manchester Sixth Annual Show, 36 Guppy Classes: Venue and further details from B. Morris (Show Secretary) 4 Irwell St, Burnley Lancs.

25th June: Newport A.S. Open Show at St. Johns Hall, Victoria Avenue, Maesod, Newport, Gwent. Details from show secretary, B. Webster, Glenview, Mount Pleasant, Ponenewydd, Pontypool.

25th June: Nailsea and District A.S. Annual Open Show at the Holy Trinity Church Hall, Church Lane, Nailsea, to be held in conjunction with the Donkey Derby. Details from Mr. D. Kenwood, 90 Slade Road, Portishead BS20 9BB.

26th June: Dunlop Aquarium Keepers Society Open Show to be held in the Dunlop Factory Canteen, Speke-hall Avenue, Speke, Liverpool 24. Further details from secretary, T. Griffiths, 19 Belper Street, Garston, Liverpool L19 1RG.

26th June: Alfreton and District A.S. Annual Open Show at Alfreton Hall. Details and Show Schedules available later. P. W. Bosser, 10 George Street, Riddings, Derbyshire DE5 4GP.

3rd July: Chard and District A.S. third Annual Open Show at Furnham School, Chard, Somerset. Details from A. Griffin, 50 Fairway Rise, Chard, Somerset, TA20 1NT. Show schedules available end of April.

9th-10th July: Romford and Becontree A.S. Open Show, Dagenham Town Show, Central Park, Dagenham. For Show schedules (April), Show secretary, R. Jones, 87 Wood Lane, Elm Park, Essex. Tel: 49 56947.

15th July: Scunthorpe and District A.S. Venue to follow.

16th July: Lytham A.S. Show Lytham Baths, Dicconson Terrace, Lytham, Lancashire (Same venue as last year). Show Schedules from Show Secretary, Mr. P. Hatn, 1 Wyndent Grove, Freckleton, Preston, Lancashire, PR4 1DE, Tel: Freckleton 633182.

16th July: Goldfish Society of Great Britain General Meeting, 2 p.m., Small Hall, Conway Hall, Red Lion Square, Holborn, London WC2.

17th July: S.E.L.A.S. Open Show at 141 West Greenwich House, Greenwich High Road, London S.E.10. Details from T. Asquith, 49 Central Avenue, Welling, Kent. Tel: 01-854 1232.

17th July: Scarborough and District A.S. Open Show. Further details later. Show secretary J. J. Richardson, 5 Keld Garth, Pickering, N. Yorks YO18 8DG.

17th July: Sandgrounders A.S. Annual Open Show at Meols Cap School, Meols Cap Road, Southport.

24th July: The South Humberside A.S. will hold its second open show at the Memorial Hall

Cleethorpes. Further details from W. Drury, 273 Wellington Street, Grimsby.

7th August: East Anglia Open Show, Waverley Fish Farm, Diss, Norfolk. Viewing from 1.30 p.m. Further details from G. Wright, 98 Lower Cliff Road, Gorleston-on-Sea. Tel: 0493-68440.

14th August: Oldham A.S. Open Show at Wernith Park, Oldham. Information and show schedules can be obtained from A. Chadwick, 741 Broadway, Chadderton, Oldham. Tel: 061-652 0809.

14th August: Grimsby and Cleethorpes A.S. Sixth Open Show at the Memorial Hall, Cleethorpes. Benching from 12 noon to 2 p.m. Details and show schedules available from the Show Secretary, L. Curtis, 4 Swaby Drive, Cleethorpes, South Humberside DN35 6PB.

20th-21st August: Third Yorkshire Aquarist Festival at Doncaster Racecourse. Show secretary, Mr. B. D. Chester, 7 Rose Lea, Ordsall, Retford, Notts.

21st August: Streteford and District A.S. Open Show at Bude Hill High School, Eccles Old Road, Salford. Details from J. Brown, 18 Royston Court, 72/74 Carlton Road, Manchester 16.

21st August: Stroud and District A.S. Annual Open Show at the Subscription Rooms, Stroud. Full tropical classes plus twelve classes for Coldwater. Schedules later from Mr. J. Cole, 13, The Hill, Randwick, Stroud, Glos. 4504.

21st August: Macclesfield A.S. Open Show. Details to follow.

27th-29th August: Tyne Tees Association of Aquarist Societies second exhibition of fish-keeping at Lambton Pleasure Park, Chester-le-Street. The Three Rivers Championship will be included in the programme. Further details available at an early date.

27th August: The Fourth Welsh National Open Show and Exhibition of Tropical and Coldwater Fish will be held at the Sophia Gardens Pavilion, Cardiff. Further details available from C. Turner, 146 Arran Street, Roath, Cardiff. Tel: 499982.

28th August: Long Eaton A.S. Open Show—Details to follow.

1st September: Goldfish Society of Great Britain, General Meeting, 2 p.m., Small Hall, Conway Hall, Red Lion Square, Holborn, WC2.

4th September: Castleford A.S. Open Show at the Civic Centre, Castleford. Schedules and information can be obtained from show secretary, F. Holmes, 46 Elmest Road, Ferry Fryston, Castleford, Yorks. Tel: Castleford 599485.

4th September: Bridgewater A.S. Second Open Show will be held at St. Georges Community Centre. Details from Show Secretary, D. Hilton, 31 Portland Road, Worsley. Tel: 061-790 8106.

4th September: Wellingborough Open Show (F.B.A.S.). Venue: Weavers Sport Centre. Show Secretary, A. J. Crew, 67 Swinburne Road, Wellingborough, Northants. Tel: Wellingborough 77131.

4th September: Hoylake A.S. Open Show. Venue to be announced later. Secretary, G. Robinson, 24 Heathmoor Road, Meerton, Wirral, Merseyside L46 7UN.

10th September: Hounslow and District A.S. Annual Open Show to be held at the Youth Centre, Cecil Road, Hounslow, Middlesex.

11th September: Harlow A.S. Open Show at Moot Hall, The Stow, Harlow.

11th September: Longridge and District A.S. first Open Show at Longridge Civic Hall, Willows Park Lane, Longridge, Preston, Lancs. (15 minutes from the M6). Details available later.

17th September: Bristol A.S. Open Coldwater Show at Bishopston Parish Hall, Gloucester Road. Schedules from Show Secretary, E. N. Bowden, 15 Inns Court Green, Bristol BS4 1TX.

18th September: Whitby and District A.S. Annual Open Show at the Spar Pavilion, Whitby. More details at a later date.

18th September: Barnsley Tropical Fish Society Open Show. Mappletwell and Stamcross Village Hall, Darton Lane, Mappletwell, nr. Barnsley. Further details from T. Busfield, 31 Coniston Road, Barnsley S71 1EL.

20th September: Aireborough and District A.S. Autumn Mini Show at Greenacres Hall, New Road Side, Rawdon, Nr. Leeds. Schedules from G. E. Cuff, 31 Oakdale Drive, Bradford, W. Yorks. BD10 0JF. Tel: Bradford 632424.

25th September: Atlantis Fishkeeping Society First Open Show at the Aintree Institute, Black Bull, Aintree, Liverpool. Schedules will be available later.

25th September: Chesterfield and District A.S. Annual Open Show will be held at Clay Cross Social Centre.

1st October: The Ichiban Rancho Society National Rancho Open Show, Seymour Hall, Seymour Place, Westminster, S.A.E. for schedule to Mr. J. Hilton, 5 Woolmers Mead, Pleshey (Show Secretary) or ring for details Bishops Stortford 870395. There will be

six classes, with Engraved cups for 1st, 2nd and 3rd, plus Award Cards and Specials.

2nd October: Ealing and District A.S. Open Show. Venues to be announced.

2nd October: Newbury and District A.S. Open Show to be held at the Corn Exchange, Newbury, Berkshire. Show Secretary, Mrs. Shirley Canning, 6 South End, Cold Ash, Newbury, Berkshire. Tel: Thatcham (0635) 64254.

15th October: East London Aquarist & Pondkeepers Association Annual Open Breeders Show, at Ripple Road School, Ripple Road, Barking, Essex. Schedules available from T. Waller, 1 Sparsholt Road, Barking, Essex.

16th October: North Wilts First Open Show at Swindon. Details later.

23rd October: Huddersfield T.F.S. (at present provisional date).

3rd November: Goldfish Society of Great Britain, General Meeting, 2 p.m., Small Hall, Conway Hall, Red Lion Square, Holborn, London, WC2.

6th November: Halifax A.S. Open Show at the Forest Cottage Community Centre Cousin Lane, Illingworth, Halifax. Schedules sent only on request. S.A.E. to: D. Shields "Cobblestones" Gaiest, King Cross, Halifax, HX2 7DT, or Ring for details Halifax, 60116.

6th November: Village Bar A.S. Details from G. Corum, 81 Barston Road, Oldbury, West Midlands B68.

6th November: Blackburn Aquarist Waterlife Society Open Show. Venue at a later date. Secretary, Mrs. Jean Wolstenholme, 39 George Street, Great Harwood, nr. Blackburn BB0 7JH.



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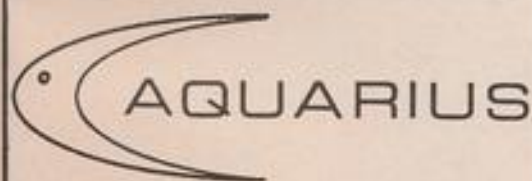
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