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AQUARIST

AND PONDKEEPER

The Magazine for Fishkeepers



Fossil Corydoras Catfish

Pygmy Gourami



THE AQUARIST

AND PONDKEEPER

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The Editor accepts no responsibility for views expressed
by contributors.

August, 1981

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Editorial

WATER WATER

EVERYWHERE . . .

IN THE U.K. we have taken water for granted for too long, we are told by the water authorities. A myriad of reasons are proffered in support of the scarcity value of this once commonly obtained commodity but the most telling proof of water's new found value is reflected in the rocketed charges imposed upon us all in the form of water rates.

While it hurts to pay such a high price for water, it is even more painful to endure flood conditions and in later fourteen day rainless periods to be alerted to a drought situation. But things were ever thus—they are merely more so of late.

Water is the topic of this piece because, as our emblem proclaims: "Water is the cradle of life and the field wherein repose all our endeavours." Without water our charges are bereft of life but a superabundance of this elixir can be more than disconcerting as some pond owners may have discovered during the last throes of this year's unhappy month of May. In the writer's part of Sussex unaccountable floods have thrice in nine months swamped houses and gardens and with an admixture of sewage have accorded garden-swimming pond fish the unwelcome presence of some dubious companionship. With local authorities unable to explain why the flood water cannot be accommodated by the existing drains and unable also to afford remedial action because of financial cuts, the onus of prevention or cure becomes that of the individual.

So how are we to maintain our pond fish in unpolluted conditions and to retain them in the quarters we have provided during the enforced insanitary freedom of garden-sized swims? It seems that these 'once in a hundred years' phenomena are to become the norm in many areas so perhaps a rethink of pond design is indicated. Instead of excavating for pond construction it may be more practical for some of us to build a walled concrete basin upon a prepared mound with steps ascending to the periphery. Such a pond would certainly have its advantages when it required emptying.

The presence of an orthodox pond in one's garden raises problems in times of flood not the least of which is the recapture of wayward fish experiencing a new found freedom. The writer's recent familiarity with such tribulation spanned the small hours of 3 am to 5 am which period encompassed the rapid rise and fall of high water levels. The rapidity of the fall, however, was attributed subsequently to pumping operations further afield by the fire brigade. But with no knowledge of an impending return to normal levels one might be inclined to snatch what remained of sleeping time to rest from salvage operations within doors with the possible daylight spectacle of unretrieved fish high and dry after the recession of the flood water. Perhaps some resourceful readers may have practical solutions to offer.



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Commentary

by

ROY PINKS

Technology

MY BROADSIDE in the March *Aquarist* about the infamies of the electric light and tube manufacturers seems to have the support of many aquarists who are as puzzled as I am about both the true purpose of the more recent innovations and the pricing policy surrounding them. One is being forced to the conclusion, because the trade is either unwilling or unable to justify itself, that one might as well buy cheap fittings and ordinary cold colour tubes at the reasonable prices asked, for all the provable good which the more expensive alternatives will do. Better still, forget electric lighting for all normal purposes, by siting your tank in a position well served by natural light, using auxiliary lighting purely for occasional decoration or during the dark evenings.

Mr. T. Hatton of Rochester was particularly scathing about poor value for money by echoing my own protest, and at the same time drawing attention to what he considered to be over-pricing of the fairly newly introduced Tetra sponge filters. He quotes the (basic) Brill at about £3, and the Brilliant at £5.50. As he has been using Uno Polyfilters for some time at about 50p, and has found them admirable, he wonders what on earth is going on. I should certainly like to hear from the promoters what their version is. I should perhaps reiterate a point I have often made on such issues, which is that in comparatively specialized hobbies like fishkeeping, the costs of producing many articles will be higher than one would think because they are generated for a small and not very flexible market. So you might invent a real winner in the fish trade, yet take years to get your due reward: on the other hand a comparable item of household goods might bring in a small fortune overnight.

But, to be fair to the consumer, I have always understood that new products were put on to the drawing board in response to demand. The example quoted by Mr. Hatton hits this right in the middle, and one is again tempted to conclude that here, once again, is technology for its own sake, totally without relevance to consumer opinion. I cannot help recording that when I note that some advertisers will even offer digital/analogue watches in their glossy catalogues, they cannot have any respect for his intelligence or powers of discrimination. Perhaps Mr. Hatton would not altogether agree with me when I question whether a filter is necessary at all? I have

never, excepting in marine aquaria, found one indispensable, so I prefer to spend my own money on plants and fish, rather than on hardware of questionable worth.

Those Primulas

My recent comments about the value of members of the Primula family in the environment of the pond have been substantiated to some extent by my local success with a single packet of *P. obconica* seeds. The accompanying photo shows a corner of my pond area which I decided last year to dedicate to some of the primulas; the specimens shown were simply planted out late last summer to fill up the vacant ground, and will be relocated this year to greater effect. For an overall expenditure of about 50p, here are some 40-odd plants which were retailing at 45p in the local garden centre. They took exactly a year from seed to bloom; most of the species will behave in a similar fashion, though they will all perform better after a year or so.

Primulas are like the primrose, with blooms close to the foliage: polyanthus have the blooms raised on stems, well above the leaves, and most of us are familiar with these two types, commonly seen in both gardens and in the wild. However, there are some less frequently met forms. The obconicas illustrated are like drumsticks and come in a range of colours from white to purple, in the spring. This is the time when most of the fairly familiar ones are in full cry, but it should not be assumed that they are totally spent for the year once the main show has passed. They take something of a rest until July, when the cycle restarts, and odd blooms will continue during the autumn and often throughout a mild winter, though these are well below their best.

Hailing from the Himalayas, the candelabra polyanthus hold their flowers on very high stems, some being over 2 feet high. There is a wide range of colour in the flower, and in the stems, too, some being silvered and others black. The flowering season lasts into July, so there is a wealth of possibility here for the gardener suffering from July doldrums, when many gardens are, strangely enough, sadly lacking in interest. Then there is *P. vialii*, which flowers like a tiny red hot poker about midsummer, and *P. secundiflora* is evergreen, its flowers being rosy and shaded with black.

This is just a foretaste of what there actually is. All they need is initial treatment as described in my earlier article, and a moist area in which to live. It is as well to split up clumps every 3 years or so, and to work into the soil some organic material each year. Although I have hundreds of plants ready for trial during the coming year, and will be reporting on them next year, lose no time in getting your seed in or your order placed, because they really are pretty foolproof things to grow and they will go a long way to raising to decorativeness the surrounds of your pools, which are usually dreary beyond belief because they are planted with the stilted recommendations of the average water garden catalogue, chosen on account of their ability to suppress all competitors, but to charm very little, if at all.

The Fossil Catfish

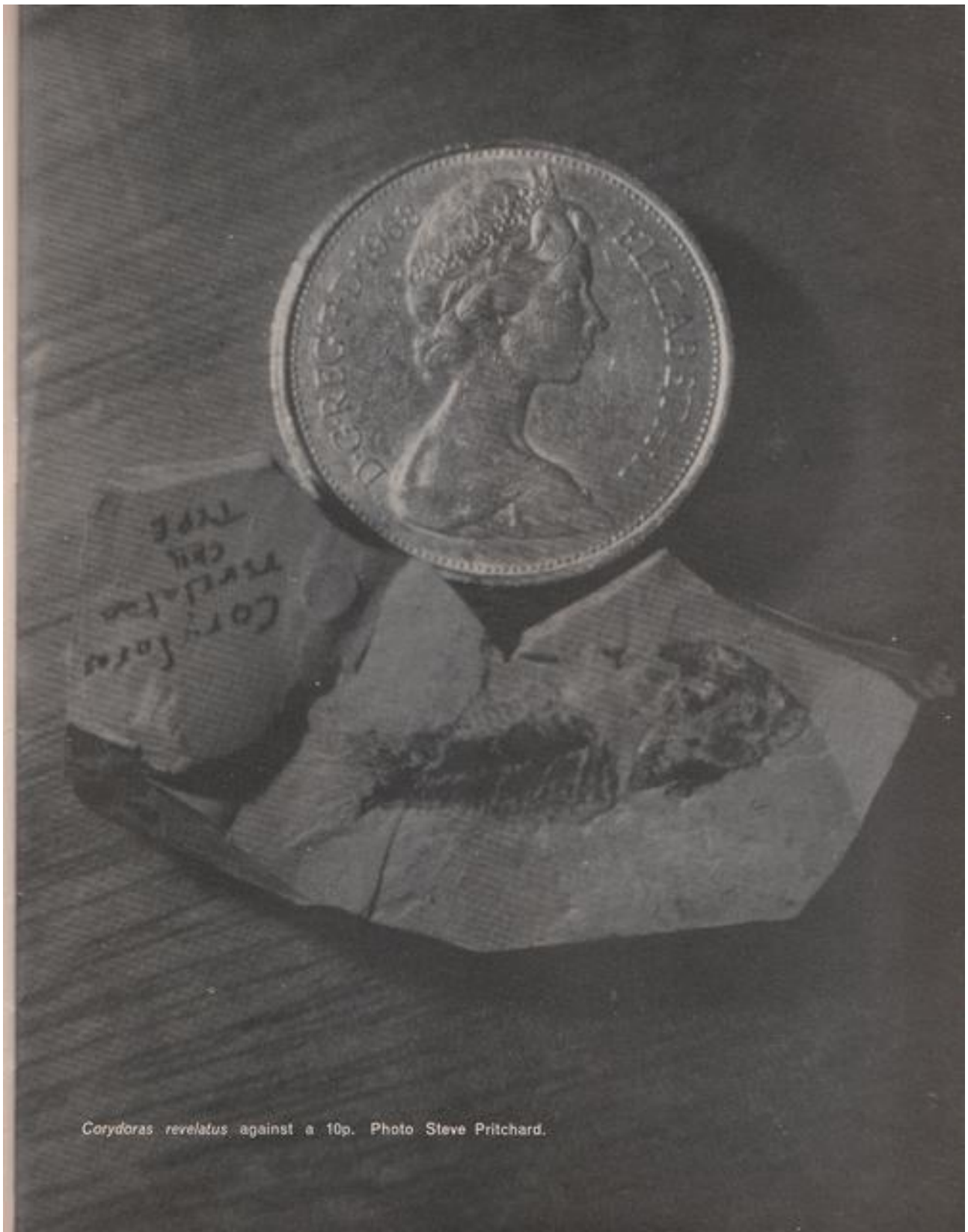
Corydoras revelatus
Cockerell, 1925
by D. D. Sands

IN MAY 1978 I travelled to Holland to see Dr. Nijssen and Mr. Isbrucker of the University of Amsterdam, the intention being to arrange for the scientists to lecture in London at the Catfish Association convention on their many years work on the genus *Corydoras*.

My interest in this group of small South American catfish had reached an inquisitive peak, so I armed myself with a file crammed with questions; mostly of the naive or simple type! One of the many exciting points of discussion provided me with a quest to examine the only complete fossil of a *Corydoras* stored anywhere in the world, which just so happened to be at the British Museum of Natural History. On my return to London I made contact with Dr. Patterson of the paleontology department who kindly agreed to allow me several visits to his section to handle and photograph this unique piece.

I had been informed that complete fossils of any member of the catfish order *Siluriformes* are extremely rare, although some fossilised bones of African catfish exist in museum collections. Scientists have remarked on the strange absence of a fossil record relating to existing South American catfish, such as loricariids and other armoured forms, as they would seem to be ideal fossil material. It may well be that they are hidden in some remote or inaccessible region and await discovery.

In the 'cathedral' of museums I introduced myself to Dr. Patterson who led me behind the scenes to the rows of cabinets within which are stored countless fossils (at least far too many to exhibit) and showed me a large draw containing the tiny fossil away from the public's view. It measured only 38mm in its entirety and a mere 10mm or so thick, but it clearly represented a member of the genus *Corydoras*. I was allowed the use of a powerful bench microscope so that I could examine every detail and was kindly left alone with this fascinating 'splinter' of natural history. When the Dr. rejoined us (Steve Pritchard, my constant companion had just completed photographing the fossil) and led the way to the reference library so that I could read the copy of "Science" published in October 1925. This copy stood on the shelf amongst hundreds of "Science" volumes published in America.



Corydoras revelatus against a 10p. Photo Steve Pritchard.



The author examining *Corydoras revelatus* under a high powered microscope. Picture Steve Pritchard.

The page revealed that the fossil had been accidentally discovered by professor T. D. A. Cockerell (of the University of Colorado) and his wife whilst they searched for fossil insects in the Jujuy Province, Argentina. Rather than attempting to absorb the information in the library, Steve photographed the page or so, after which we thanked Dr. Patterson for his valuable time given to us and left the museum against the inward flow of visitors.

The paper revealed that Cockerell was in the Jujuy Province with his wife and a Mr. George Harrington to comb the green Tertiary rock for fossil bees when he came across his extraordinary find, which he later described as a new species of *Corydoras*. The fish measured 27mm from the snout to the base of the caudal fin. Cockerell compared it with the species of *Corydoras* best known at the time. He suggested the large size of the eye and body depth resembled *Corydoras paleatus* Jenyns, 1842 "as discovered by Charles Darwin during the voyage

of H.M.S. Beagle." Cockerell then observed the heavy dorsal fin spine and compared his find with *Corydoras armatus* Gunther, 1868, which is known to have a pungent dorsal spine. By inspecting a projected 'blow up' photograph of the fossil it is quite easy to detect a slight flaw which runs through the stone. This flaw breaks the dorsal spine and gives the impression that the spine is longer than it actually is.

Professor Cockerell, having compared the fossil with known species of *Corydoras*, decided to name the fish *Corydoras revelatus* and deposited it with his collection of other fossils at the British Museum. By the surrounding rocks he dated the piece to late Tertiary which suggests the species shoaled in the Argentine rivers some 60 million years before its discovery.

Next time you observe your delightful *Corydoras* in your modern aquarium, contemplate the history behind Professor Cockerell's considerable find.

All you've ever
wanted to know
about Aquatic
trading—
(and never dared ask)

Many people in the aquatic trade must necessarily spend much of their time travelling the world and our well known Marine Columnist, Graham F. Cox, is no exception. During a recent trip to the Far East he sent us the following communication in the form of a telex.

We found it highly amusing and thought readers might like to enjoy it with us.

As revenge for not telling me that the passport photobooth seats moved up and down, I didn't explain to my wife that her camera could be moved up and down . . .





... or from side to side!

COWARDS SHOULDN'T FLY. No mankind should fly. If God meant us fly He give us wings. Please, I'm not ready for wings. Wonder why doctor shook hand in firm, final way, suggesting meaningful but not ongoing relationship at this point in time—and other appalling distortions of English language. Perhaps he feel guilty after injecting approximately 10 gallons (Imperial!) of paratyphoid A/B and cholera vaccine into left arm. Doctor say it only one millilitre so why I such a baby? I better at calculating gallonages than doctor and I say it 10 gallons! Anyway left arm now size of large water melon from elbow up. At last check arm throbbing massively at 62 throbs/minute.

Wife and I walk into departure lounge, London Heathrow. Rather, she walk I limp. Ruptured achilles tendon last summer. Showing younger son how to deliver cricket ball correctly. We sit near bar which I steered her toward. Wife say if I not stop moaning she leave me. I wittily retort I stop moaning if she leave me. She leave

me. She intently study huge destination board. Revolves continuously like demented cricket scoreboard. Boycott must be batting. Wife casts angry glances in my direction. This bodes ill for forthcoming business trip. Evil eye. I decide go for drink in departure lounge bar. Order large scotch. Find I have no money and have to go back and ask wife for fiver. Return and pay for scotch. Barman now has my money. No longer interested in my limbs. Says he can't stand all day listening to arm/leg hard-luck stories—has other customers to serve. Walks to other end of bar and immediately picks up *Playboy*. Wonder in what sense he used word "serve"?

Can see wife through plate-glass door. If looks kill, I now sitting in nuclear devastated area. Idly wonder how much it cost to bribe Spandau guards to exchange wife for Hess. I return wife's look with interest just as 8 feet tall, 400 pounds Japanese Sumo wrestler walks in with small boy. Decide to adopt intermittent facial twitch until take-off or until Jap leaves bar whichever is sooner. Order another large scotch. Porn-reading barman ask if arm and leg now affecting facial muscles as well. I smile weakly up at wrestler who glowers down at me with pronounced facial twitch. Decide to discontinue facial twitch immediately. Wonder whether I be safer with wrestler in bar or in departure lounge with wife. Smile over towards wife through glass door. Decide I be safer with wrestler. Order another large scotch. Had two sips only when Jap child begin emitting gurgling and screaming noises and pulling at trouser leg. I amazed to see I have lowered stool leg onto child's foot. Wrestler bends toward me at waist and begins raising alternate bent legs off floor whilst making noise like bull. I drink very fast and leave bar after first walking left eye into plate glass door. Wrestler not following but wife is. Dodge quickly into Gents. cursory examination of eye reveals that it may soon be larger than upper left arm and certainly more spectacularly coloured. Delicate shades of purple, olive and yellow already.

Wonder if Axelrod, Barraclough and other intrepid explorers have this trouble. Should never have left bed. Not even thirteenth today either. Look through toilet door keyhole. Wife still hovering outside. Return to wash-hand basin. Apply cold wet handkerchief to eye. Not only weird colour now but nearly closed. Go back to keyhole just as someone open door on right eye. Feel like crying but new entrant is Jap wonderboy. Mustn't let side down. Seriously consider garotting him instead but remember his father. Decide to overlook the incident this time. Apply cold compress to right eye and left eye. Oriental boywonder leaves. Am just trying to spot wife through keyhole again before right eye completely closes when policeman, adjusting dress and flexing at knees, appears from toilet cubicle behind me. Sees me at keyhole. Explain about wife and wrestler. He ask why I speaking with Russian accent and looking through keyholes at international airport. I see he also have revolver. I explain I Yorkshire not Russian and mongol features due to badly designed doors. He say what Russian accent, mongol features and looking through keyholes got to do with doorways and anyway where's my passport. I quickly hand passport over. He falls about. I explain that reason for Quasimodo photo due to wife not explaining before sending me to Woolworth's photobooth that seats adjustable for height. Had to make body that shape to fit face into mirror. Policeman ask if I need doctor. I explain about cold compresses, doctor's promises that arm go down in 2-3 days and that ankle getting better. In slow, deliberate way as if explaining to imbecile, policeman explain he not thinking about eye, arm or leg doctors, Sir.

Rejoin wife and patch up tiff with box Black Magic purchased from hysterical girl counter assistant who ask if I walk into door. In superb throaty American drawl which make John Wayne sound like transvestite I tell her I Ali's chief sparring partner and girl should see Ali's face this morning.

Successfully board aircraft without loss of life nor limb. Force wife to sit in rearmost seats because,

- a) you can smoke there without loud clucking noises from friends of earth, and
- b) airplanes nearly always crash nose first.

Wife says next time we fly, we use separate airplanes. I store this promise for future use. Airplane successfully takes off without apparent loss of any major structures. However, I am sure that 89th rivet on aileron of starboard wing is slightly loose. I ask opinion of several other passengers. Wife promise that if I don't shut up, stop making fuss and imagining things, she go and sit somewhere else. I shut up and try to stop noticing things because desperately need another drink and wife now have all money. Decide not provoke her further and pretend go to sleep despite it only 10.15 am. Out of three-quarter closed right eye I glimpses pretty hostess approaching for drinks order. When she reach me I astonished to hear, as if in a dream, wife say, "Let sleeping dogs lie. He have anymore lubrication he fall off airplane." Follows this up with several other equally witty epithet-laden sentences. Each and every one I store away for future retaliatory

action. One mustn't let one's side down, must one? Stretching and yawning in best convincing manner, I awake sleepily and order large scotch and tomato juice without for wife. When delivered, wife grabs scotch and hands me tomato juice. Perhaps all for best really.

For thousandth time wish I hadn't watched Burt Lancaster in airplane disaster movie last Christmas.

After waiting in queue longer than Selfridge's sale, eventually reach disgusting toilet and see that both eyes now fat and purple-yellow.

There must be easier way to earn living than this. Teaching not even this bad. Even prospect of facing 4E for molecular chemistry on a cold, wet, windy Monday morning better than this.

18 hours from now next stop Sri Lanka—pearl of Indian Ocean and home for three important customers and millions of exotic fishes.

Ah well! that's life.

IN OUR NEXT ISSUE

NET IN HAND IN BORNEO. Part 1 of Andrew Wickman's colourful account of his fishy adventures in South East Asia.

THE FLAGFIN ANGEL. Martin Heywood tells us about this fascinating marine fish.

Rudolf Zakal suggests that the *Haplochromis thomasi* may be an **AFRICAN CICHLID OF DUBIOUS GENUS!**

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SPOTLIGHT

Trichopsis pumilus

by Jack Hems

POPULARLY KNOWN among some tropical aquarium keepers as the pygmy or dwarf gourami (an epithet also applied to the more robust-looking *Colisa lalia* from India), the sparkling gourami, the dwarf croaking gourami, the green croaking gourami and the pygmy croaking gourami, this diminutive anabantid (members of the family Anabantidae are characterised by the presence of labyrinth-shaped accessory breathing organs on each side of the head, which enable them to breathe atmospheric air) is extensively found in and around Thailand, Kampuchea, Nth and Sth Vietnam and thence through Malaya to Sumatra and probably beyond. (Java and Kalimantan states D. McInerney in *All About Tropical Fish*). Incidentally, some writers on tropical freshwater fishes refer to the species and its congeners under the generic label of *Ctenops*. Species of *Ctenops* or *Trichopsis* have been kept in heated tanks for close on seventy years. Nevertheless, there is no time better than now to mention that, in an unsigned article in *Aquarium Digest International* (No 10, 1975), the writer states that *Ctenops nobilis*—a 4 in. fish from north-eastern India and Assam—represents the entire genus.

But to return to the subject of this article, *T. pumilus*. This fish has a compressed body, elongate in shape, and coloured dark olive-green on the back shading down through paler tones of green to whitish below. Both sexes display conspicuous blue-black dots extending from the snout to the root of the tail. Above and

below these markings are rows of blue-green, blue, or reddish brown dots overlaid (according to the position of the fish in relation to the source of strong light) with a pinkish to violet-blue sheen.

The dorsal fin is short-based, the non-spinous (3) rays rising high at the front and falling away quite abruptly at the rear. The membranous parts are greenish yellow spattered with red to brown. The caudal and long-based anal fin are similarly marked. The ventral fins are yellow and taper to needle-like points. The pectoral fins are clear. All major fins have red top and bottom edges. The pupils of the eyes are black rimmed with electric blue. But this is not to say that the colours of the fish remain constant. Temperature and mood have a noticeable effect on coloration, which is increased or decreased as the fish undergoes a change in its emotional or physical state. The sexes resemble each other greatly, that is to say in general appearance, but a careful study of a number of specimens in a tank will almost always reveal some distinguishing features. For one thing, the female is the slightly smaller of the two and her colours, except at time of high excitement, are less jewel-bright than those of the male. Then again, her anal fin tends to be rounded posteriorly; that of the male is usually pointed, sometimes with a few rays of the dorsal and anal fins prolonged. A fully grown male can attain a length of about an inch and a quarter.

If you are fortunate enough to



obtain a true pair, then sooner or later they will spawn, for the species is a reasonably free-breeder, if conditions are right. The species demands, for normal maintenance, a temperature of about 80°F (27°C) and plenty of plants that spread their foliage along or near the surface of the water. *Vallisneria spiralis*, species of *Echinodorus*, water ferns (*Ceratopteris*) fill the bill well.

Raising the temperature of the water a few degrees above the general level will set the scene or ought to set the scene for spawning. In most cases, the male enhances his already striking colours and goes out of his way to attract the attention of the female. When she is stirred by his extra attention and dazzling garb and movements, she will soon show signs of sexual arousal—easily denoted by her own improved coloration and coquettish comings and goings in the plants. Her sides show a greater fullness, too.

Between seeking out the female and chasing and pushing her about (as much as she will permit before retreating from his approaches into a sheltering cloak of massed plants), the male decides on a spawning site and blows bubbles on the underside of a leaf or leaves to form a nest, but not necessarily at the surface of the water. Some males prefer to blow their bubbles under leaves in mid-water. Exceptionally some specimens favour a spot closer to the bottom or even under a ledge of stone or inside an overturned clay pot or the like.


Interestingly, during courtship and spawning croaking or crackling sounds are emitted by both fish. These sounds are achieved by the rapid gulping in of air and then forcing it out of the labyrinth organ.

Less than a hundred eggs are ejected by the female and she releases them during the course of typical gourami-like embraces. At a temperature of 86°F (30°F) or thereabouts, the eggs hatch out within the space of about 36 hours. The male assumes full responsibility for the care of the brood and keeps the female away from the nest. The fry hang to the underside of the vegetation or clustered bubbles by a tiny thread which



stands up from the head. In a matter of days the threads dwindle away as the yolk sac is absorbed. The fry stay in close proximity to the nest as it breaks up and just before, or just after its dissolution they swim free. At free-swimming stage microscopic food must be provided. The sort of food recommended is freshly hatched brine shrimp, small infusorians and if they are making rapid progress, microworms and freshly hatched gnat larvae. In a week or two the parent fish should be removed from the tank. (It is sometimes advisable to remove the female after spawning is over in case the male develops into too much of a tyrant. Fortunately not all males do.)

T. pavilus is no trouble in a community tank stocked with small fishes as non-aggressive as itself. For breeding, however, the couple picked should be placed in a tank measuring about 18 in. x 10 in. x 10 in. The water should not be deeper than about 7 in. Any matured water will do. Whether confined to breeding quarters or swimming free in mixed company, it is of supreme importance to keep the top of the aquarium well covered with a sheet of glass to keep cool air from getting in. This piece of advice cannot be over-emphasized when the aquarist has a tank of baby fish; for the fry usually take their first gulp of air during the first four to five weeks of their existence. A gulp of cool air at this stage of their development would prove fatal.



**Coldwater
Jottings** by Frank W. Orme

IT SEEMS, from reports which I received, that the start of the goldfish breeding season caused some problems. Often the breeding pair were reluctant to spawn although they appeared to be in breeding condition. This was a problem which I also encountered and solved by letting the pair remain in the tank to spawn when they were ready to do so. Some goldfish breeders complained of spawnings which proved to be infertile—one well-known breeder told me that out of six early spawnings only two resulted in fertile eggs. The Newsletter of the Northern Goldfish and Pondkeepers Society mentioned that some of the members had reported that, although their fishes spawned without too much difficulty, the period of the spawning was of only a short duration—often the fishes had completed spawning by about 9.00 a.m., after which they showed no further interest.

These problems were not confined to any one particular area of the country, for I received similar complaints from many different parts of the U.K. Most blamed the rather mild winter, and lack of any spring-like weather when it was most needed. I had found that my own stock had failed to become fully inactive for more than a few days during last winter and, more often than not, could quite often be found slowly swimming around in their tank. Probably most goldfish breeders believe, as I do, that a period of dormancy in cold conditions induces a more vigorous spawning during the following spring. If this is true, then it could well be that the problems are due to the vagaries of our seasons during the past few years—for there now seems little sharp division between one season and another.

Despite these complaints, Nature has a way of rectifying things, and later spawnings proved to follow a quite normal pattern. And, it may have been my imagination, but the young seemed to grow much quicker than usual—as though they were making up for lost time. Perhaps, in view of the very cold spring temperatures, the problems were merely evidence that Dame Nature knew best and did not want any young fish trying to survive the unkind conditions—after all, she is not aware that the aquarist can artificially create the warmth required to hatch the spawn and raise the fry satisfactorily.

Cruelty to Goldfish

The May issue of the magazine of the British Koi-Keepers Society (which has a membership in excess of 1,500) carried a report culled from *The Daily Telegraph* of March 26th. It read as follows: A man who sold a sick goldfish was found guilty of causing unnecessary suffering to an animal. The 1½ inch fish, bought by Mr. Alan Garlinge, had an abscess on its side. Mr. Garlinge complained to the R.S.P.C.A. who sent an inspector to visit the shop from which the fish was purchased for 50 pence.

Mr. Alan Hanson, a veterinary surgeon, told the court: "The right course in a case like this would have been to despatch the goldfish humanely. Unnecessary suffering has been caused by allowing the fish to continue living in that condition."

The shop proprietor said in a letter to the court that defending the summons would have cost £150 in legal fees, which was too expensive for a goldfish. Magistrates found the case proved that unnecessary suffering had been caused to a captive animal by omitting to provide necessary care and attention. The shopkeeper was conditionally discharged for 12 months and ordered to pay £60 costs.

From Kingssteignton, in Devon, I received a letter from Mr. Ron King, who is a well-known judge of goldfish and a breeder of various coldwater fishes. He enclosed a cutting from an April issue of the local newspaper, headlined 'Goldfish Charge Dismissed' it reported that a woman charged with abandoning two goldfish in circumstances likely to cause unnecessary suffering had her case dismissed by Teignbridge magistrates.

The woman, who came from Bristol, was charged with abandoning the goldfish in Ashburton on September 1 of last year. But the court was told by Sgt. John Tucker that the case fell outside the limitation period and that the magistrates would have to dismiss it.

A second charge of abandoning a kitten was dismissed for the same reason.

One can only surmise why this woman travelled from Bristol to Ashburton in order to abandon the two goldfish and a kitten—had she tried to lose them previously in Bristol, only to discover that they had found their way back home? But, to be serious, it does show that the Law, in some parts of the country, has begun to realise that it is possible to cause suffering to fish, and are prepared to prosecute those who cause unnecessary suffering to the creatures. Surely this is a good omen for the future.

Notes on

Lo vulpinus

the Foxface

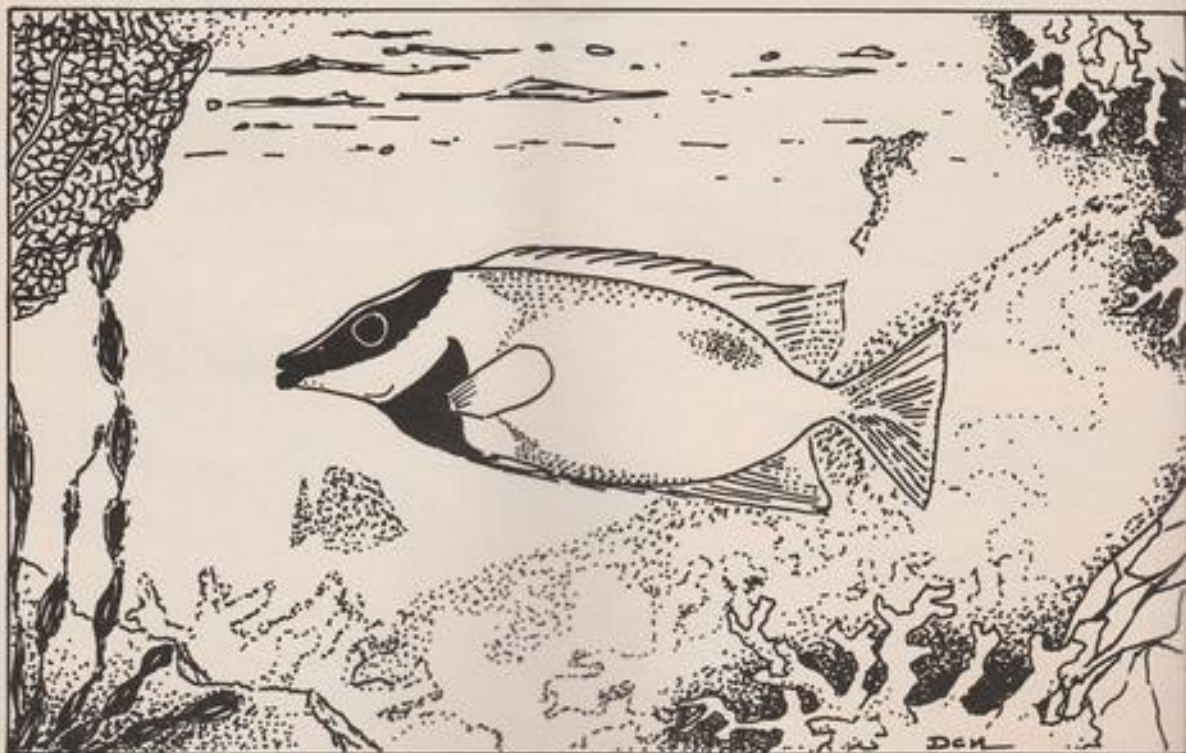
by David C. Morgan

A MARINE SPECIES we now see more frequently in our dealers' tanks than in the last few years, is a brightly coloured and rather shy fish called *Lo vulpinus* which is now popularly referred to as the Foxface.

Specimens offered for sale are usually 2 to 3 inches in length and are ideal for the aquarium at this size. Their normal body colour is a rich deep yellow, possibly with a hint of brown on the back of the fish and with a single brownish spot under the last few rays of the dorsal fin. The head, with its pronounced snout and dog-like profile, provides a strong contrast with broad black and white stripes which at first sight look quite ridiculous. Only when one views the animal at night will its secret be revealed.

The animal dozes with its head poking out of the coral heads where the black and white pattern breaks up its outline making it very difficult for predators to see. The body also develops broad irregular brown bars horizontally, presumably to the same end.

Apart from the colour changes, another defensive mechanism also becomes apparent. The rays of the dorsal and anal fins quite often stand erect. These rays contain a moderately powerful poison which can cause severe pain in human beings. We must therefore resolve to handle them very carefully. By taking appropriate precautions and using common sense we can expect no



problems. If by any chance the skin is punctured, consult your doctor as sometimes an infection can result from the wound. I have heard it said that the sensation is almost the same as a wasp or bee sting only more intense, but as I have never been stung myself I cannot verify this.

The fish also displays these characteristics of colour change and erection of its fins if startled. If another occupant of the tank becomes a nuisance the rays of the dorsal may be repeatedly primed, flick-knife fashion, until the threat disappears. It does not however, chase or worry other fishes at any time and is perfectly happy to browse sedately around the aquarium looking for scraps of food.

Diet, as with most fish, should be as varied as possible and include a large proportion of vegetable matter. Mine readily take vegetable and mixed flake, irradiated sea grass, mussel flesh and white fish finely chopped. Freeze dried *rubifex* and mysis shrimp are taken without hesitation and they positively adore live *daphnia* and brine shrimp.

When moved into a new tank they may not feed at all for several days and plenty of cover should be provided for the fish to hide in. Rocks and pieces of coral, suitably treated of course, make ideal backgrounds, with many small caves for the fish to explore. I use some of the gaudy dried sea fern that is sold in packets to provide a complete contrast to the colours of the fish. It works well too, but unfortunately fades with age. I make it look as natural as possible by cementing two or three strands of fern to a pebble with silicon adhesive (aquarium grade) and then place the pebbles in the coral sand near to the rocks. Even without these elaborate measures, once the foxface has settled down, feeding should be easy.

With regard to tank size we must provide fairly large accommodation. I would say no less than thirty gallons because in too small a tank they become very lethargic, a state that cannot be good for the fish if prolonged. In my opinion a 48 inch long aquarium will suffice admirably but a 36 inch aquarium is too small.

As far as general hardness is concerned, the following is applicable. Little or no nitrite can be tolerated in common with most marine fish. It is interesting to note that provided the water is in good condition, it does not appear to need to be violently agitated, as is the case with surgeons and tangs which, in many ways, it closely resembles. In other words, heavy circulation of the water is not absolutely essential, although it certainly won't be harmful.

I recently had a devastating outbreak of Oodinium in my community tank which cleared three of my best specimens; my own fault I suppose, as I had not isolated and quarantined all new additions. I was very impressed with the way the foxface fought to stay active and feed. It responded very well to treatment with "Cuprazine" and I am glad to say a complete cure was effected. I conclude, therefore, that it is not very susceptible to copper poisoning, as are some of the butterfly fishes.

The fish occurs in the wild from Samoa, through Palau and Bikini to the East Indies. There are indications that

Lo vulpinus

its range could be even more widespread. It is a true coral fish, inhabiting the shallow reefs, though occasionally it is reported in deeper waters. I cannot find any authoritative reports on the size it grows to naturally, but it probably exceeds a foot in length.

The fish belongs to the family Siganidae and because of its tubular snout has been placed into a separate genus, 'Lo.' Older references may place vulpinus in the genus *Siganus*, but as only one other species of this group develops a snoutish mouth with age, *Lo* is now generally accepted.

I feel I must attempt to clarify the previous paragraph. A fish's scientific name usually comprises two words. The first word spelt with a capital, is the genus to which it belongs. A genus is a group which may contain many fishes (or only one) which are closely related. The second word refers to the species. Very occasionally a third word sub-divides yet again.

Even that is not the end. Genera which are similar are gathered up into families. A family encompasses groups of fish which vary considerably in appearance but have features in common with each other. Finally, a reference to the ichthyologist who first named and identified the species is made in brackets after the scientific name. Fortunately we can simply say 'foxface' to our dealers, and they should know what we mean.

So, to sum up. The foxface is a brightly coloured coral fish which adapts well to the life in captivity. It is quite hardy and easy to feed, and provided we give it enough room should afford the successful marine aquarist years of splendid company.

Colisa labiosa

by A. van den Nieuwenhuizen

Colisa labiosa and *Colisa fasciata* are both species well-known for a long time. *Colisa fasciata* was described by Boch and Schneider in 1801 and *Colisa labiosa* by Day in 1878. In the fish-keeping business they have been known since about the end of the nineteenth century, as *Colisa fasciata* was imported for the first time in 1897. Six years later an example of *Colisa labiosa* came to Europe (from Moulmein in Burma) via the importer Hans Stüwe of Hamburg. A good six years later again Scholze & Pötschke of Berlin imported a large number of *Colisa* species from the Rangoon area in Burma. Joh. P. Arnold described them as *Colisa labiosa*. Later he discovered that this was not correct and concluded that they must have been *Colisa fasciata*. He did not make this known until 24 years later, however, in his book "Overseas Freshwater Fish" (Arnold-Ahl), following which an article on this subject appeared in "Wochenschrift" (1) in 1950. The imported fish were very easy to breed and since some of them survived the First World War a comparison was able to be made with *Colisa* species imported probably by a West German import firm, again from the Rangoon area, after the Second World War. As a result, Helmut Pinter was of the opinion that the fish which survived the First World War were really "Aquarium-Labiosa" being, in fact, members of the species *Colisa fasciata*, as they were very similar to fish of this species subsequently imported from Burma. Pinter (1965) believed, further, that there were no genuine specimens of *Colisa labiosa*, unlike Neupert and Dieter (1965) who were of the opinion

that both species were to be found in our hobby.

The truth is that the two species have been cross-bred in the past and hybridization is also possible with *Colisa lalia*. Pinter also mentioned at that time that he himself, with the help of an airforce captain, had imported wild specimens of *Colisa fasciata* from two different locations 600 km apart. One of them was near Patna in the Indian province of Bihar and the other near Dacca in Bangladesh (formerly East Pakistan). According to Pinter, both were easy to cross-breed with the Aquarium-labiosa and the offspring fertile.

Colisa fasciata was described in 1801. In relevant literature the following places of origin are given: the plain along the Coromandel Coast in the states of Tamil Nadu and Andhra Pradesh, Bengal and Bangladesh and Assam in northern India.

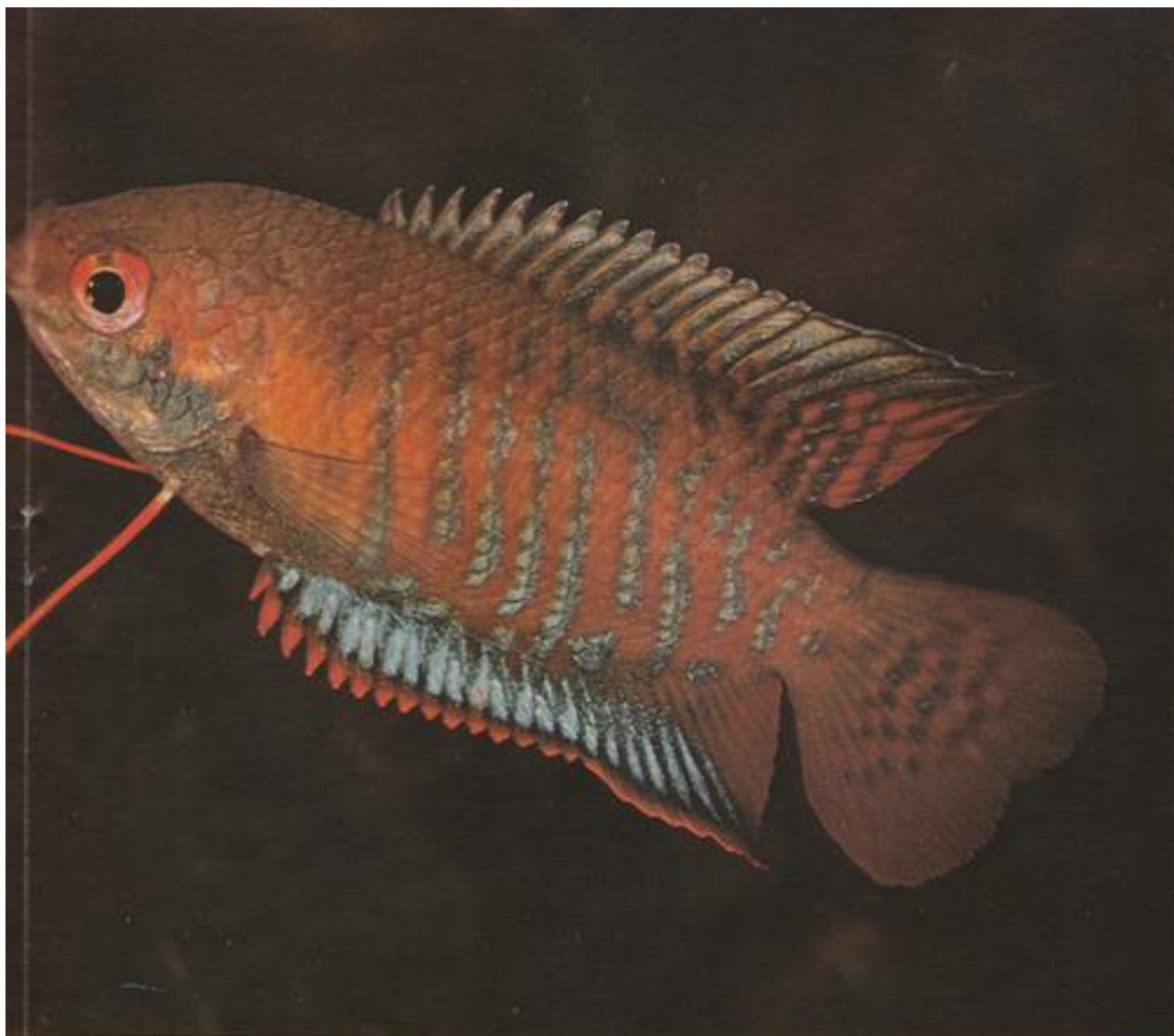
Colisa labiosa was described 80 years later. According to Day's description it is found in Burma; in the river basin of the Irrawaddy river and the Sittang river, the delta region in southern Burma and, according to Ch. T. Regan, it is also found in the Shan highlands to the east of Burma. In addition, another place it may be found is the region of Tenasserim (an area of rain forest).

The details about the origin of these fish, therefore, are distinguished by a clear demarcation between India and Burma.

The following, therefore, is somewhat odd: to celebrate the twenty-fifth anniversary of its existence, the firm Scholze & Pötschke published an illustrated price catalogue in book form. In this breeding pairs of the



two species were offered for between two and four marks. Both species were illustrated by Curt Scholze. *Colisa labiosa* in black and white and *Colisa fasciata* in colour. It can be assumed that the illustrator-importer had observed the fish very closely before he drew them and it is interesting to note that he gave *C. labiosa* a rounded anal fin and *C. fasciata* a pointed one. The distribution of *C. fasciata* is given as eastern India and for *C. labiosa* . . . south-east Asia



Colisa fasciata

and not Burma. This does not accord with the information, then, that the 1911 imports came from the Rangoon area in Burma. Otherwise, why is this region not included in the distribution of the fish? How the confusion arose at that time is, of course, no longer subject to clarification.

In more recent literature Horst Linke (1980) remarks that, as far as looking after and breeding the fish are concerned, there is very little difference

between the species. In his article he gives drawings of both species with a description and expresses the opinion that, as long as there is no revision, *Colisa fasciata* and *Colisa labiosa* must be accepted as valid species.

Hans-Joachim Richter, too, is of same opinion, for in his book on labyrinth fishes (1979) he includes illustrations alongside his text. Two drawings clearly demonstrate the differences in body shape, as do his colour photographs of the two species.

Similarly, the difference can clearly be seen in the photographs accompanying the present article. (On the cover of the D.A.T.Z. magazine bearing a picture of *Colisa labiosa*, the caption *Colisa fasciata* was once inadvertently added). It is an undeniable fact that the dorsal and anal fins of the male *Colisa fasciata* are pointed at the end. The body is more elongated than in *labiosa*. In addition, the line of the back very often curves inwards and this is also true of

the line of the abdomen. In *Colisa labiosa* the dorsal line is either straight or, more often, a little arched. Furthermore the males have a rounded-off anal fin. I have identified them in this way for 25 years and for me this has always been the essential determining characteristic. Also, it may be said that the coloration of *labiosa* is not as marked as is the case with *fasciata*, although here the conditions in which the fish are kept are an important factor. Further, the colours of *Colisa labiosa* are not as variable as in *C. fasciata*. That *fasciata* can vary a lot is substantiated by the testimony of Pinter, for example, writing about the fish he imported. He stated that the fish from the two collecting areas looked so different that it was difficult to believe they were the same species. The most beautiful *fasciata* I ever had is the red form shown in the illustration. Unfortunately, it must be said that commercially available *Colisa fasciata* (in Holland at any rate) are often in poor condition and that the beautiful specimens of twenty years ago are virtually unobtainable. In contrast, the examples of *Colisa labiosa* which are on sale are usually very fine specimens. In both species it is easy to differentiate the sexes. The females have rounded-off dorsal and anal fins and their coloration is more subdued. Whether there is really any great difference between the lengths of the two species I would not know. It is true that *C. fasciata* is described as growing up to 10-12cm in aquarist literature, but the largest specimen in my experience was 8-9cm, after careful attention in the aquarium.

Labyrinth fishes of the genus *Colisa* have always been popular in our hobby. Several points are relevant regarding their care, however, and these should not be forgotten, in spite of the fact that these are suitable fish for beginners. Basically, the *Colisa* species are most at home in an aquarium which is subject to daylight. I have been able to establish this over the years by comparing the fish in my home with others which I have kept in my fish house which has glass panels in the roof; also, by comparing fish from an aquarium with artificial

lighting with their subsequent condition when I housed them in a tank illuminated by daylight only. This does not mean that fish kept in an artificially illuminated aquarium are not worth looking at. On the contrary, assuming of course that the conditions in which they are kept are of the same type and standard. It should also be mentioned that these species do not appreciate a lively community tank, especially one with occupants such as Sumatra Barbs (*B. tetrazona*), for example, as they are inclined to nip at the feelers of labyrinth fishes. This is especially unfortunate in that *Colisa* species make use of these in approaching and making acquaintance with their fellows.

Like related species, *Colisa labiosa* likes an aquarium which is well planted along its edges where the fish can take refuge. This vegetation should not be of uniform height. It should be a little lower in the corners especially, with groups of plants on both sides of the open area reaching up to the water surface and a few floating plants above the open area. Given such an arrangement and a number of peaceful fish, nest-building and spawning occurs in due course.

The water can vary between very soft and medium hard. Up to 15° DH, in my experience. Usually, however, I kept them in rather soft water because I used to lower the degree of hardness of the water by employing a filter adapted to this purpose. On average a water temperature of 25°C is just right. I prefer not to have the temperature too high for labyrinth fishes, so that the difference between the water and air temperatures is as low as possible.

As far as food is concerned, this should consist of as varied a diet as possible and, above all, live food. This does not mean that they will not accept dried food, but labyrinth fishes are very sensitive to an excessive build up of adipose tissue which may be a consequence. Helmut Pinter has pointed out that many preparations of dried foods contain animal proteins mixed with binding agents which contain, in their turn, a lot of carbohydrates. Carbohydrates (sugar in various forms) hardly figure in the

natural food of the fish. If the fish are fed with too much dried food the danger exists that they take in too many carbohydrates. The carbohydrates not used up are not excreted by the fish but converted into fat and stored in their bodies as a reserve food supply mainly, unfortunately, in the sexual organs. Adult labyrinth fishes are particularly prone to this and, according to Pinter, build up reserves of fat within a few months to a hopeless degree. Being interested in such matters, I have conducted tests and it is a fact that the fish have to be written off as far as breeding is concerned. This also means, however that one can be disappointed when one buys beautiful pairs all ready for spawning, from a dealer. Especially in the case of the red variety and the blue variety of *Colisa lalia* and *C. labiosa* one then has beautiful, plump females. They then appear less attractive, unfortunately, when pairing fails to produce a single egg. It pays, therefore, to put the fish straight into a breeding tank to ensure that they will stay healthy, and at a later stage to enable fish which are ready to spawn to get rid of their eggs. For, if gravid females retain their eggs, then nothing more will come from them. If one has the serious intention of breeding, it follows that the fish should be given the opportunity to pair on a regular basis.

In addition to these matters, it is recommended that care should be taken on the question of temperature. It is important to keep *Colisa* species in water which has a constant temperature. So there must be no sudden fluctuations in temperature, nor any great difference between day-time and night-time temperatures. *C. labiosa*, *C. fasciata* and especially the blue variety of *C. lalia* react unfavourably otherwise. One possible consequence is Oodinium, to which they are rather susceptible, as I have observed in *C. labiosa*. It is also very difficult to combat and keeps reappearing whilst other fish in the aquarium remain free of trouble. An interesting peculiarity I was able to observe in an aquarium in which this occurred was the way in which an example of *Anostomus terretzi* acted as a cleaning fish and



Colisa labiosa



The embrace and expulsion of eggs

corner of the breeding tank a flat piece of slate is placed which reaches the surface of the water and behind which the female can find a hiding place. On the other side of the tank floating plants, and the thicker the layer and the darker it is beneath it, the more readily the male will accept it as a future spawning site. They prefer to build the nest under the plants or directly at the edge of them, or between the stems of leaves growing above the surface of the water. The size of the nests is very variable. In the case of *fasciata* I have seen nests of several centimetres

formed. On average, however, they were 4cm high. With *labiosa* I usually had flat nests with an average width of 10cm. These had relatively little or very little foam when they were built, for example, under a layer of moss in a corner of the aquarium. As is characteristic of the labyrinth fishes, the female is driven away as long as the male is engaged in building. But the female keeps coming for a look and when she enters the male's territory she always puts on a display with wide-spread fins. The male does the same, at first at any rate, but then he sails around the female and

suddenly darts towards her with open mouth. If the nest is ready the behaviour of the male changes and he even tries to entice the female towards the nest, as one can observe in the case of *Colisa lalia*. The female, however, has the initiative in pairing. The photographs show the pairing procedure.

Before they actually spawn, there are a number of mock pairings, which do not produce any eggs. Then there is a "cloud" of 10-15 eggs and then the number gets bigger and bigger until there are 50 and sometimes many more eggs per pairing. After such a



The pair retrieving eggs (male above)

large "cloud" there almost always follows a pairing during which once again no eggs are extruded. The number of effective pairings is more than 30 and so the number of eggs easily surpasses a thousand. The spawning condition of the fish, of course, plays its part here.

After the pairings it is better to carefully remove the female and entrust the care of the nest and eggs to the male. The large number of eggs not collected together by the male directly after the pairings, are then retrieved from the surface by him and blown into the bubble nest. After a short time it can be seen that there are more eggs than bubbles, as it were.

At a temperature of 26°C the young

are free-swimming after four or five days and feeding is immediately begun with pond infusoria. How many young survive and their subsequent quality is dependent upon, above all, the amount of food during these first days. Daily replacement of a portion of the water is equally important. During these first days water is drawn off by means of an air pipe and water stone which hangs in the tank. In this way the water is slowly but surely drawn off and no small fish larvae can escape from the tank. Fresh water must of course be of the same temperature as the water in the tank and be introduced carefully. From the fourth day one can also begin to clean up the bottom by using

a siphon. This is important because on the same day one also begins to give the fish freshly hatched, finest brine shrimps. In order to create a better concentration of food the water level can be lowered to about 10cm, but then the large number of young fish are immediately separated into several rearing tanks. A low water level is also an advantage during the time in which the fish develop their secondary breathing organ, the labyrinth. Now it is very important that the air temperature above the water surface is kept high, otherwise many young will perish.

During the rearing of *C. fasciata* and *C. labiosa* one soon notices that the young grow at different rates. Larger specimens are regularly removed, therefore, and transferred to another tank. The growth rate is very much dependent on the amount and quality of the food offered, the size of the rearing tank, the quality of the water and regular illumination of at least 12 hours. As has already been mentioned, the maintenance of a constant temperature is naturally very important.

All in all, it can be said that the care and especially the breeding of these labyrinth fishes entails a lot of time and care. If one is prepared to devote this time in order to ensure the fish are reared with optimum care, then it's all worthwhile and success affords a great deal of pleasure to every hobbyist. Later one can select the best specimens and use them for breeding in due course. This is especially so for *Colisa fasciata* as the quality of fish offered for sale is, unfortunately, much too poor generally.



Product Review

WHENEVER I am asked to undertake a product test in a hurry I always refuse. I believe that if I am going to give my opinion on some new piece of equipment I have to have time to make up my mind.

So I am sure Mr. Conrad Ellison of Uno products will forgive me for taking two months to put his new 'Nova' thermostat through its paces.

It has already been acclaimed by the trade, winning the Star Product Award at the 1981 British Pet Trade Fair at Harrogate, but will such an innovative idea as using silicon chips to regulate the temperature in our tanks go down well with the average aquarist?

I believe it will—even at a price of £14.98 including V.A.T.

With a new product such as this one is always tempted to go somewhat overboard in recording its technicalities—blinding the reader with science in a lot of cases, into what he comes to think must be good because it sounds so technical.

It simply isn't necessary.

In my opinion, as an aquarist of 20 years experience, this is simply the best thermostat to be made available to the British fishkeeper.

It lived up to all the claims made for it and hasn't been an iota of trouble. My only criticism is that I would have liked the temperature range to be calibrated on the Hi-Lo scale. But that is a minor gripe compared to the overall quality of the unit.

Uno Products started the research for their new 'stat some two years ago and in that time have spent about £15,000 on its development. They have engaged the services of highly qualified staff to both advise and design new products based on silicon chip technology and if the 'Nova' is the first example of that investment it looks like money very well spent to me.

Its accuracy is considerably better than the bimetallic strip models holding to within $\frac{1}{2}^{\circ}\text{C}$ when set, as opposed to about a two degree fluctuation with normal units.

There are no moving parts, which automatically eliminates any problems caused by sticking contacts, and with its system of warning lights showing if the heater has failed, it must help people with expensive fish—like marine fishkeepers or Discus breeders—sleep a lot easier.

It is simply connected up to the heater and the mains, and being fitted with an earth wire cannot be faulted from a safety aspect. And when you are connected up you simply hang the sensor in your tank with the suction cup provided, while the unit is clipped well away from the water on any convenient point—another good safety point in its favour.

It is also tamper-proof; suppressed to stop any T.V. interference; made with components subject to strict quality control; and accompanied by a very comprehensive leaflet of instructions.

Adjustment is carried by a small knob on the top of the unit with the standard setting of 75°F coming in the centre of the scale.

It looks good, it works well and it gives your fish just about the best protection money can buy. What more can I say?

BARRY DURHAM.



Epiplatys dageti by M. Addicot



Epiplatys dageti (Poll 1953) has been found in S.W. Ghana and parts of the Ivory Coast where it inhabits swamp areas close to the coast. It may actually exist over a wider range than is at present known.

There are various colour "strains" of *E. dageti* varying from one locality to another. The throat in some specimens is red but a more usual colouration is chrome yellow to almost white. The vestigial eye "spot" is visible on top of the flattened head.

Aquarium-raised male specimens will reach 2½ to 2¾ inches whilst females are smaller at 1½ to 2 inches. The females are similar to the males except that all their fins are rounded and almost transparent.

Maintenance and breeding. *E. dageti* is not suited to life in an aquarium of mixed species, otherwise they are easy to keep in an aquarium and water conditions are not critical. They dislike disturbance of the water surface as by aeration and prefer a still surface with cover in the form of floating nylon mops or vegetation. All normal aquarium foods are accepted.

Adult *E. dageti* are very prone to devouring their fry but the relatively large eggs may be collected over a period

and hatched in suitable shallow containers. Floating nylon mops may be used as a spawning medium, or peat fibres may be hung over the side of the tank into the water. By far the best results have been obtained by using sphagnum moss completely submerged but allowed to rise about half of the water depth. For some reason this material seems to stimulate the spawning urge, maybe reminding the species of its natural swampy habitat. A rise in temperature may also induce spawning but this is not essential, a temperature of 74°F being suitable for breeding and general maintenance.

The eggs hatch in about ten days at 72°F. The fry may be fed on micro cels but *infusoria* may be beneficial for the first few days before graduating to larger forms of live foods. It may be twelve months before the fish are fully developed.

Two subspecies of *Epiplatys dageti* are now in the hobby and they are *E. dageti dageti* and *E. dageti monroviae*. This information has been adapted by Barbara Brown (Publicity Officer BKA) from an original Information Pamphlet written by Fred Wright for the British Killifish association.



Coldwater Queries

by Arthur Boarder

Are colour varieties of orfe, tench and carp hardy enough to survive a hard winter outdoors?

If you mean the golden orfe, the golden tench and such ornamental carp as hi-goi and koi, then the short answer is yes. Mind you, the water must be deep enough (at least 18 in.) to give the fish adequate protection against frost.

With better weather not far ahead, I plan to make a pond in our rear garden. Unfortunately, there are no large trees or shrubs nearby to offer any shade. Hence the site I have chosen will be in full sunlight for the greater part of the day. Will long days of sunlight have a detrimental effect on the pond plants and fish?

A pond made near trees is in a most unfavourable position. The roots of trees and large shrubs often penetrate the bottom or sides in their quest for moisture. In autumn falling leaves are a constant worry; for too many fallen leaves in the water will soon produce noxious gases and toxic conditions. A pond built where the sun plays over the surface most of the daylight hours grows water-lilies well, and their pads afford shade and cooling shelter for the fish. Aeration plants—and you must provide plenty to supplement the oxygen absorbed from the contacting atmosphere—inhibit the growth of minute vegetable organisms (free-floating algae) which give rise to what is popularly called 'green water.'

I intend to purchase a tank, 36 in. x 15 in. x 15 in., for coldwater fishes, such as Fantails, goldfish, comets and moors. How many fishes will the tank hold and which plants are suitable?

Your tank will hold 22 inches of length of fish, not including the tail. I do not recommend having comets as they are too much like goldfish but are fast swimmers and need a very large tank or better still a fair sized pond. An indoor tank does not need any fishes which dash about in it.

For plants you can have some *Vallisneria spiralis* to spread over a fair part of the back half of the tank and some *Egeria densa* or *Lagarosiphon major* to cover the back corners. A few plants of *Hygrophila polysperma* can be set near the middle of the tank. There is no need to try to grow too many varieties of water plant as after a time you will find that those recommended would be all that you need. If you try to grow too many species you may find that some will not thrive with others.

READERS SERVICE

Our experts are always pleased to receive your letters which should be addressed to:
Readers Service, The Aquarist & Pond-keeper, The Butts, Brentford, Middlesex, TW8 8BN.

All queries requiring a personal response must be accompanied by a stamped addressed envelope.

Do Black Moors require tropical treatment?

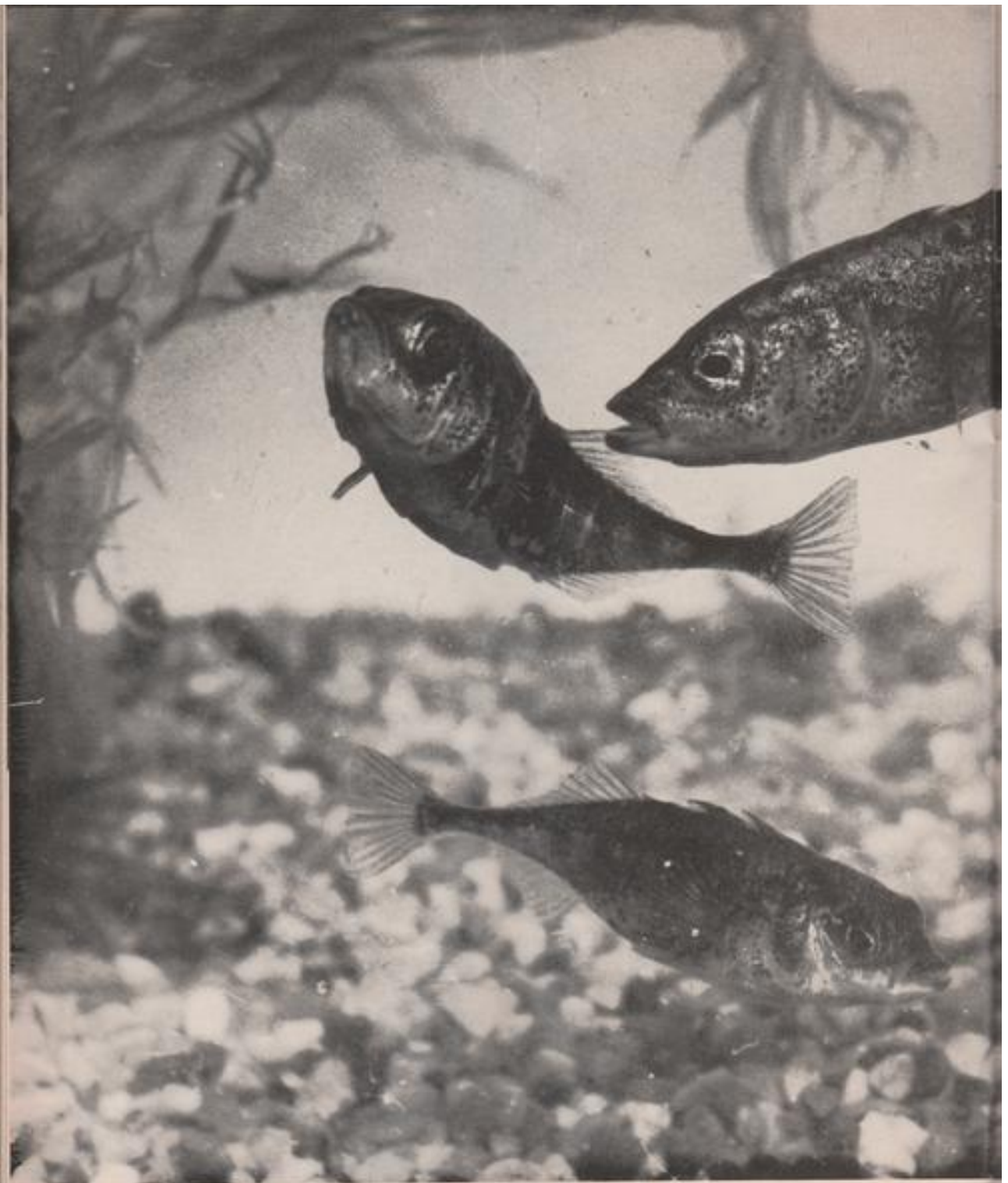
Moors are quite able to endure the usual temperatures for other fancy goldfish. As some of them may have been bred under rather warm conditions, it is advisable to enquire of the supplier at which temperature they have been kept, so that they are not subjected to a sudden change in temperature. By the way, as all Moors are black there

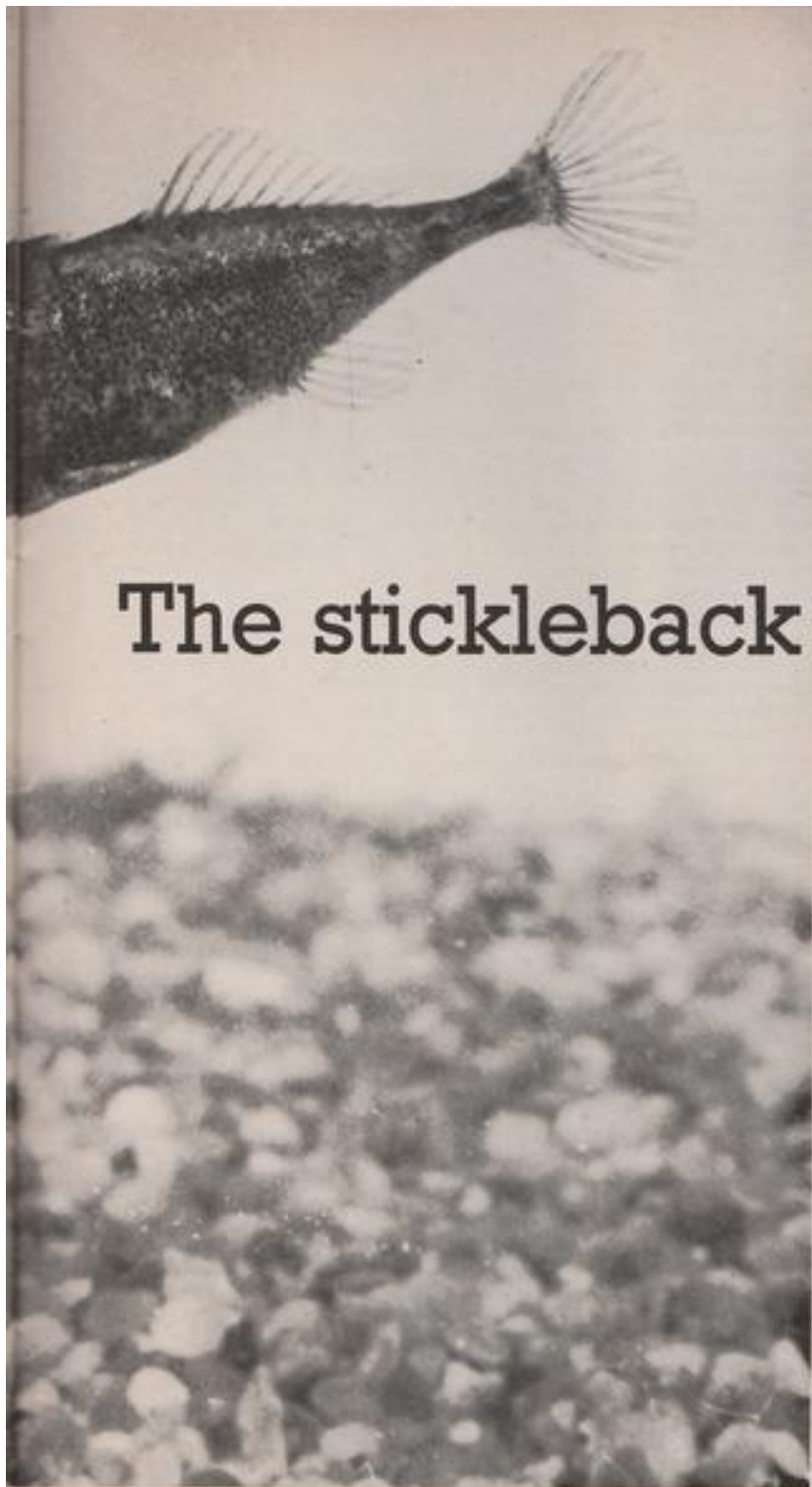


is no need to add 'Black' to the name as if they were not black they would not be Moors. I am surprised at the number of advertisers who still use the unnecessary adjective. I also deplore the term 'Bristol blues', for Bristol Shubunkins. There is no such variety of fancy goldfish as a Bristol blue.

I have four Bristol Shubunkins, about 4 inches long excluding the tail, and would like to breed from them next year. I have them in a large heated tank and wonder if I should keep them warm and feeding all the winter? Also, would they be more likely to spawn if I made a small pond in the floor of a greenhouse? Are my fish large enough to breed?

It is better to gradually get your fish used to colder water. They are then more likely to breed next year. You could keep them below 50°F., and they need not be fed as long as this temperature is not increased. A small pool in the greenhouse would certainly be better for breeding the fish in than a tank, as you could have a larger surface area. The pool could be quite shallow. The fish are quite large enough to breed.





The stickleback

THE STICKLEBACK is possibly the best known of our small native fish. There is hardly a pond or stream that sticklebacks do not inhabit. It is the delight of children who, armed with net and jar, set forth to catch these active little fish. Alas! The fate of those captured by these intrepid young fishermen may be somewhat sad. Within a few days many will have perished from being confined in narrow-necked jam-jars, or some other unsuitable container. Yet the hunt never ceases, and the youngsters set off again and again to catch further supplies of this

Native Aquarium Fish by Frank Orme

beautiful little fish. Few adult aquarists bother to keep sticklebacks, yet if they were a new discovery, instead of being our commonest fish, I have no doubt many would seek to have them.

A fish of the cold and temperate regions of the northern hemisphere, the stickleback (*Gasterosteus*) is to be commonly found in waters ranging from fresh to brackish. Britain is home to three species: the three-spined and ten-spined species of freshwater habitats; the third, the fifteen-spined, occurs in brackish to salt water environments. It is the three-spined stickleback which, being the most common, is generally caught.

Three Spined

The three-spined stickleback (*Gasterosteus aculeatus*) can reach a length of around 4 inches; the usual size, however, is seldom more than 2½ inches. The body is fairly deep, the shape somewhat resembling a miniature tunny-fish. The spiny, first rays of the dorsal fin, from which the fish derives its common name, are separate and usually three in number, although sometimes there may be two or four. The rest of the

dorsal fin consists of about fourteen, connected soft rays. In place of the pelvic fins there is a sharp, hard spine on each side of the body. The males can be very pugilistic, and are particularly aggressive during the breeding season—when the pelvic spines can be used with deadly effect against an adversary.

Between May and June the males and females assume a deeper coloration, a sign that they are ready to commence spawning. The female takes on a distinct yellow tinge, and the male sets out to equal the colour of some tropical fishes. His throat and belly become a brilliant orange-red, his back green and his eyes an electric-blue in marked contrast to the normal colours of blue-black or dullish green sides and back with paler colour below.

Exotic Colours

The male's exotic colours play a part in an elaborate courtship ritual by which females are enticed to enter the nest which he has constructed; there he fertilises the eggs which are laid, after which she is driven away. The eggs are minute in size, looking rather like a cluster of poppy seeds and, when newly laid, are a bright yellow colour. They change to a darker hue as they develop. The male will guard the eggs until they hatch. These parental duties will continue for some time after, keeping the fry herded together near the safety of the nest whilst he protects them from any enemies with an amazing show of ferocity.

The stickleback is one of the few fishes which builds a nest. The nest is made of tiny pieces of plant fibre, the material usually matching the bottom of the pond or stream so closely that unless the movements of the fish are carefully watched, it is almost impossible to pick out the nest from its surroundings. The fragments of material are bound together by gelatinous threads produced by a secretion of the kidneys which become swollen and changed in function during the breeding season. The lower half of the nest is completed first, then the sides are constructed, and finally the roof.

Only the male builds the nest and, during the time that the eggs are hatching, he will refuse to eat as he constantly remains on guard and fans the eggs to prevent any debris settling on the spawn. This action also serves to oxygenate the water around the eggs.

Ten Spined

The ten-spined stickleback (*Gasterosteus pungitius*) has the same breeding habits as the previous species. A somewhat slim fish, rarely exceeding a length of 2 inches, it is usually dark olive upon the back with light yellowish sides and belly. During the breeding season the males assume brighter colours and the pelvic spines under the belly, become blue or white. Preferring to inhabit densely weeded areas and marshy swamps, it is occasionally found in the same waters as the three-spined stickleback, both eating the same types of food.

Gasterosteus spinachia is the fifteen-spined, brackish water stickleback. It is the largest of the three species and can grow to a length of around seven inches. Occurring all around our coasts and estuaries, it leads a more solitary existence than its freshwater relatives. During the breeding season a mantle of blue is assumed by the male, whilst the female remains the normal green colour. The nest is formed from a suitable frond of seaweed, usually at the margin of a rocky pool in a well sheltered spot. Sticky thread-like secretions are used to bind the seaweed, which is pushed and pulled into a pear-shaped structure about the size of a man's closed fist.

Keeping and breeding the freshwater stickleback in aquaria presents no great difficulties. It must be remembered that these are very aggressive fish which should not be kept with any but their own kind. Also, being wild fish, they could be host to various problems and must be treated accordingly. Common sense dictates that they should be subjected to a period of quarantine, before being placed into their permanent quarters—only the foolhardy take unnecessary risks.

Plenty of Space

Make sure that the fish are provided with as much space as possible; after all, they have been accustomed to enjoying unrestricted swimming in their natural waters. Where possible, nothing less than a 24 in. x 12 in. x 12 in. tank should be contemplated to offer the best chance of success. Set the tank up well beforehand and make sure that it is well planted with plenty of fine-leaved plants arranged in thickets. Do not be in a hurry to introduce the fish, but allow plenty of time for the tank to settle down. For the size of tank quoted it will be sufficient to stock with, say, one male to four females. If more than one male is placed in the aquarium it could lead to trouble—possibly resulting in serious injury or death of the weaker of the males.

It is most unlikely that anything other than live foods will be accepted, therefore offer whiteworms, bloodworms, mosquito larvae, *daphnia* and suchlike.

It all goes well, the time will arrive when the male will construct his breeding nest and the females will be enticed into entering and laying their eggs. Without disturbing the fish, watch them carefully and, when it is seen that the male is aggressively attacking his partners they must, for their own safety, be removed. The male will then be able to attend to his nursery duties without distraction.

Feed the fry upon small live foods, such as *infusoria*, until they are large enough to accept sifted *daphnia*. At this stage the male can be removed and, if it is wished, returned to his original home whilst the young are reared on to adulthood.

Those who decide to keep a few sticklebacks will find they make most interesting and active inmates of an aquarium which amply repay good care and attention. Over the next few months I will describe other native fish which can be kept in the aquarium or garden pond.



Tropical Queries

by Dr. C. Andrews

I am considering keeping discus, and I have been doing some reading on the subject. Water quality appears to be very important, although I am a little confused concerning pH, hardness, water softeners, etc. Can you help since I am determined to make a success of discus-keeping?

Reading around the subject before you actually attempt to keep the fish is a very important aspect of setting up an aquarium—whether you intend to keep guppies, discus, marine fish or whatever. With regard to discus you may find the following books useful: "Discus" by G Keller (around £1.00) and "All About Discus" by H R Axelrod (around £4.00) (both TFH Publications). You should also contact the British Discus Association, c/o Mr L Dann, 52 Beech View Road, Kingsby, Warrington WA6 8DG.

Discus, of course, require soft, acid water conditions, in a clean, well filtered tank. To begin with you should purchase the necessary test kits from your local pet shop, and then measure the pH, general hardness (GH) and carbonate hardness (KH) of your tap water. If the pH is above about 6.5 and the GH is above 10°dH, it will have to be made more acidic and softer before it is suitable for keeping discus. Tap water can be made softer by dilution with clean rainwater or distilled water, and this may be made more acid by allowing it to stand in contact with aquarium peat for a week or so. If you are confused about water chemistry, the book "Aquarium Water Chemistry" by R Geisler (TFH Publications, about 50p) is well written and easily understood.

What is the best food for angel fish and how can I obtain/culture it?

Newly hatched brineshrimp (*Artemia*) seems to be the best food for (the fry of) freshwater angel fish (*Pterophyllus*). Brineshrimp eggs may be obtained from your local pet shop. They can be cultured on a small scale in clean milk bottles in a warm room. Fill one milk bottle nearly to the top with clean tap water, and then add (and dissolve) about 10gm of cooking or aquarium salt. Aerate for 24 hours (with a cotton wool bung in the bottle). Add a few brineshrimp eggs, which (if kept at 20-25°C) should hatch after 2-3 days. The bottle must be aerated continuously for the eggs to hatch. The newly hatched brineshrimp may be removed by turning off the aeration for a few minutes—they will collect 3-4 cm from the bottom of the bottle (and may be siphoned into

the angel fish tank using a piece of air-line). Each milk bottle culture should last a couple of days, and by starting one up every day or so for about a week, you should have a plentiful supply of live food, eventually weaning your fish onto a powdered baby fish food.

With your interest in angel fish, I am sure that you will find the book "Freshwater Angel Fish" by Axelrod and Burgess (T.F.H. about £1.00) of some use.

Can I keep terrapins in my tropical fish tank?

No—they cannot be kept in a tank containing fish. They are messy feeders, and may chase (and even eat) the fish.

To successfully keep terrapins you should provide them with a separate tank, with shallow water heated to 25-30°C. Keep them well away from draughts, and feed a varied diet of raw meat, raw fish, tablet fish foods, and a little soft vegetable matter (e.g. lettuce). The terrapins should have easy access to a dry area (a smooth rock or piece of floating bark), on which they will bask in natural sunlight in a south facing window. Shade the tank to avoid overheating during the warmer (!) months of the year.

You should feed your terrapins approximately every other day, and clean the tank out completely about once a week. Do ensure that the clean water is at about the same temperature as the dirty. You should always wash your hands after handling the terrapins.

If you wish to keep these fascinating little reptiles, may I suggest you obtain a copy of "Reptiles" by Foden and Sutton (Bartholomew, about £1.50).

Can you send me some information on *Uaru amphiacanthoides*?

This South American Cichlid may reach 30 cm in the wild, although it is usually much smaller in the aquarium. It is quite an attractive fish, but rather delicate—almost as delicate as discus according to some aquarists! You should provide soft, slightly acid water, with a steady temperature in the region of 28°C. The tank (which should be at least 100 cm long) should have an efficient filtration system (e.g. poly-foam cartridge, or power filtration), with regular, partial water changes. Feed on soft vegetable matter, and a vegetable based flake food.

I have a 72 in. × 18 in. × 18 in. aquarium. Can you tell me how much water this holds, how many heaters (and the wattages) I will require, and how much lighting it will need for good plant growth?

Your tank holds about 85 gallons (380 litres), although you should deduct about 10% off this figure to allow for rocks, gravel etc. If your tank is in a centrally heated room it will require about three 150 watt heater—thermostats. In an unheated room you should double this number. I suggest that you try about 100 watts of fluorescent lighting left on for 8-10 hours per day. Do make sure the tank is well planted, and if you get algal problems, cut back on the duration of the lighting (and/or add more plants).

The Gower in Summer

by Anthony Wootton



Edible Crab—(*Cancer pagurus*)



A shoreward view from the outer islet of Worm's Head. Both islets are cut off from the mainland and from each other at high tide.

"THERE IS nothing, absolutely nothing, half so much worth doing as simply messing about in boats", observed the Water Rat in Kenneth Grahame's ever delightful *Wind in the Willows*. Substitute "rock pools" for "boats" and I would agree, wholeheartedly. One doesn't have to be a child to find them a continual source of delight and mystery; indeed, no marine aquarist worth his salt can afford to overlook the opportunity of studying, at first hand, the wonderful wealth of life to be found in these semi-temporary waters.

I suppose each of us has his or her favourite seaside stamping ground. Mine is the Gower peninsula of West Glamorgan, more especially that region of it which stretches from the sheer cliffs at Tears Point and the craggy promontory of Worm's Head—only linked to the mainland at low tide—to the islet of Burry Holms and Spaniard Rocks at the other end of the five-mile Rhossili beach.

It is not only the aquarist who has riches in store for him here, of course for the Gower is replete with wide variety of wildlife. A host of seabirds nest on the inner isle of Worm's Head, rendered difficult of access by a barrier of near vertical limestone stacks; and there are local plants like fen orchid and sea holly, and butterflies, such as the grayling and dark green fritillary, to be seen on grassy sward and sand dune. But inevitably it is the rock pools which draw one most. Those on the southern side of

Worm's Head, reached after the tide's recession reveals a rocky causeway, are like miniature seas—vast and deep and only really accessible to the snorkeler. One experiences a strange, vaguely disturbing fascination, almost a thrill of fear, just peering into their depths, rendered obscure and even more mysterious by the waving strap-like fronds of wrack and other seaweeds. Nearer the shore, where the pools are shallower, it is possible to find a variety of life rather more easily. Crabs abound, from sinister-looking Devil or Velvet Swimming Crabs, their stalked red eyes centred with black, to reddish Edible and dark green Shore Crabs, as well as a variety of smaller species, including one, deep purple in colour and partly encrusted by a species of sponge, which I took to be *Pirimela denticulata*.

The numbers of hermit crabs (*Pagurus* sp.) astonished me. Every pool hosted dozens of them, often in close proximity to each other, and almost invariably in the shells of dog winkles. One could scarcely blame any marine aquarist for taking one or two back for his tank, since it is doubtful if all survive such competition. Rather interestingly, none of the crabs' shells bore sea anemones. Presumably this symbiotic partnership only occurs when the crabs have developed in size and gravitated to larger shells, though one would have thought their need for protection, via the anemone's stinging cells, was greater when young.

The free-living anemones are a source of constant delight

Purple-red beadlet anemones are everywhere, and not just in the rock pools but thickly encrusting the walls of the caves and cliffs at beach level. Here and there the lovely snakelocks anemone, verdigris-green in colour, waves tentacles mindful of Medusa's snake-hair. Shoals of little prawns, virtually transparent, dart hither and thither, almost too fast for the eye to follow. Delicate brittlestars are to be found on the bottom litter or clinging to the undersides of stones, where too the occasional starfish or spiky purple sea urchin is revealed. Shellfish here are typified by the shield-like chitons, but it requires a sharp eye to spot them since the commoner species are cryptically camouflaged, and their near flush attachment to the rocks forms only the slightest of bulges. From time to time a temporarily marooned dark, oel-like shore rockling is flushed from the shelter of a weed-festooned rock, whence it dashes sinuously and with extreme rapidity for alternative cover.

So attractive and varying in content were these pools that often I stayed until dusk, returning shoreward to scramble over the barrier of huge boulders, upon which the slightest of shadowy movements spoke of the activity of sea slaters, relatives of the terrestrial woodlice.

Those pools at the other end of Rhossilli beach, on the shore side of the islet of Burry Holms, are of a somewhat different character. Sited at a higher beach level and surrounded by sand, they are kinder to tender feet than the abrasive rocks by Worm's Head. In consequence, I found them much favoured by young bucket-and-spade enthusiasts. Not that they were at all intrusive: on the contrary, they proved distinctly helpful in drawing my attention to 'new' life forms. One lithe young girl, who made me think of some beautiful maid just emerged from Neptune's under-sea court, displayed some iridescent-eyed squids she had captured; while near the head of the promontory I stopped to chat to a couple of lads who had managed to prise out a bucketful of positively huge edible crabs from beneath rock ledges—their favourite retreat when the tide goes out. One I located myself but it was so firmly wedged, with its great pincers forming a formidable front-line defence, that I decided to give it best!

And then there is the beach itself, for to neglect it is to miss a good deal. Indeed, a walk along the strandline, notably just after ebb-tide, reveals a wealth of life—or, more particularly, death—as fascinating as is to be found anywhere. Fragments of long-clawed masked crabs abound, as do heart urchin or sea potato 'tests', tiny sponges, papery *Buccinum* egg-cases, and a wealth of shells, including the ubiquitous razors. Here and there were the characteristic egg-cases of skate and dogfish, some of the latter still containing the pinkish egg-yolk. One morning I came across their progenitor, a lesser dogfish (the fishmonger's rock salmon), obviously lost by a sea angler since a length of line was still attached to it. A particularly interesting discovery for an entomologist like myself was of a colony of marine springtails (*Aneides maritima*) floating in a scummy pool: they are among the very few maritime insects to be found in Britain.



Common starfish (*Asterias rubens*), found beneath a stone in a rock pool opposite Worm's Head.

Finally, it may be of interest to recount a mild mystery. During my all too brief stay in this delightful area I had been hoping to see or find jellyfish. My naturalist's appetite had been whetted through conversation with the coastguard on Tears Point, who observed that they were quite frequently washed up on the shore. There are, of course, many species, most of them harmless, although this stretch of coastline is particularly noted for periodic invasions by the Portugese Man O'war, which can give a nasty sting. Another informant told me of huge jellyfish 'as big as a table' being sighted off Tenby pier, only a few miles across the sea in Dyfed. Presumably they were *Gyanea capillata*, immortalised, if not too accurately, by Conan Doyle in one of his Sherlock Holmes stories. As I said, I saw none, but a particular incident indicated that one might have seen me, or part of me at any rate! Returning to my lodgings one evening, I retired to rest as usual but then, on attempting to leave my bed during the night, found myself totally unable to walk, experiencing the most excruciating pain in my lower limbs, which eventually came up in lines of small blisters. It was only several weeks later that the pain finally abated, accompanied by much itching and skin-sloughing, but during all this time pressure on the flesh resulted in sharp shooting pains as if I were being stabbed by a multitude of red-hot needles. Exercise had the effect of alleviating the condition somewhat during the day, but each night brought a renewal of my incapacity to walk.

I suppose the initial attack must have occurred whilst I was bare-leggedly wading in the rock pools; perhaps a stranded jellyfish had been lurking in the seaweeds beneath a rock and raked me with its tentacles as I passed. The curious thing is that I was totally unaware of any such attack! The only explanation I can think of is that in land forays, at least, I am often inclined to brush aside stings and scratches during the excitement of some natural history chase, only nursing them later when the first flush of enthusiasm is past. Did something similar happen here? I asked the advice of several marine biologists, including the staff of the Marine Biological Laboratory at Plymouth, but they were unable to throw any light on the problem. I wonder what Holmes would have made of it?

MR. DAVE WINDER is the hon. secretary of the East Dulwich Aquarist Society and is also editor of the E.D.A.S. magazine. His address is 32 Eddystone Road, Brockley, London SE4 2DE, and he says: "In reply to your question, 'What do you gain from being a member of a club or society?' as posed in the March issue of *The Aquarist*, may I suggest the following benefits. Members of the East Dulwich Society can enjoy the following: (a) advice, help and information from experienced aquarists who will do the best they can to solve a problem; (b) a large choice of aquatic books in the club library from which members can borrow for a very small charge; (c) a magazine issued free to members of the society and containing information sheets to build into a

WHAT IS YOUR OPINION?



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

helpful guide; I have enclosed a copy for you and would be grateful to know what is *your* opinion?; (d) a programme of slide shows and lectures by knowledgeable aquarists, which can only help to increase even the *experts'* knowledge; (e) a chance for those who so desire to show their fish in both club and open competition; (f) the opportunity to buy equipment and fish at a number of bring-and-buy sales throughout the year. I think, therefore, that anybody who keeps fish should join their local aquarist society and enjoy the benefits that *all* clubs give their members." E.D.A.S. meetings are held at Dulwich Baths Reception Hall, Crystal Palace Road, S.E.22. I found the society's magazine both interesting and useful.

Incidentally, I sometimes wonder about the names that aquarists select for their own clubs or societies when they include the singular word 'aquarist' in the title. If I take Thomas Hardy's town of Casterbridge—minus Michael Henchard—and invent Casterbridge Aquarist Society it sounds fairly reasonable; however, if I invent Casterbridge Photographer Society or Casterbridge Gardener Society my point becomes somewhat clearer. A society with a name that suggests only one member sounds a little peculiar. Would not Casterbridge Aquarists Society, Photographers Society or Gardeners Society sound better? Casterbridge Camera Club or Casterbridge Aquarium Club would sound more acceptable. What do you think? Would your club or society benefit from a slight change in name from singular to plural? On the other hand, Casterbridge Aquaria Club or Casterbridge Cameras Club would sound positively peculiar.

By the way, one of my bundles of unused letters contains a s.a.e. bearing the name and address of Mrs. C. Dewsberry, 25 Maple Street, Sheerness, Kent ME12 1XH. The envelope sports a 12p stamp showing a portrait of Sir Henry Wood—which suggests that it reached me from the offices at Brentford in the latter half of last summer. Unfortunately I do not know what Mrs. Dewsberry wanted to know when she enclosed the s.a.e. Perhaps, if she reads this, she'll drop me a line; or perhaps she sent a query to one of our experts and her envelope was forwarded to my home, with other writers' letters, in error. If all else fails I may write direct to Mrs. Dewsberry using her s.a.e.—which would rather negate her having sent a s.a.e.!

My *Plant Profile* article dealing with *Ophiopogon japonicus*, the Japanese fountain plant, has brought responses from several readers. Ty-newydd, Nant-y-ffrith, Bwlchgwyn, Wrexham, Clwyd, an address that I can assure you I copied most carefully, is the home of Ms. Cheryl Girdler. She writes: "On reading your article in *The Aquarist* about *Ophiopogon japonicus*, the Japanese fountain plant, I took great interest in trying to propagate the specimens of this in my tank. The size of the tank is 24 in. x 15 in. x 12 in., the temperature is 78°F, and I use a 40 watt bulb for about seven hours daily. The pH is 7.0. The specimens are planted in fine gravel and the tank houses about ten guppies.

"I noticed that the plant comes from the lily family. I related this to the iris, which is from the same family. My father, who is a keen gardener, has propagated this with great success. It was because of this that we had the idea to propagate *japonicus* the same way. We took a rather large specimen of *japonicus* and used a razor blade to slice a piece of root. This was planted in the guppy tank. Two weeks later the specimen had sprouted more roots. I have enclosed the actual specimen used. I hope that this experiment will be of help to you. I would be very pleased to hear any comments you may want to make." (Thank you for the plant sample, Ms. Girdler. The roots were wrapped

in a plastic film but, unfortunately, the leaves had been left uncovered. The plant's trip to Brentford, presumably in an envelope, and its subsequent trip to N. Ireland in an envelope with several letters, left it rather desiccated on arrival; however, it's a fairly tough plant and I placed the small specimen you kindly sent to me in an aquarium and I hope to report on its progress if it survives.)

My short article also attracted the following response from Mr. M. Briscoe whose letter bore no address; however, I feel sure the unsigned letter is from Mr. Martin Briscoe, of 1 Fields Court, Potters Bar, Herts., a letter from whom, about *Aponogeton ulvaceus*, I included in my June feature. Mr. Briscoe's letter is headed: "Plant Profile No. 2: April 1981, by B. Whiteside. *Ophiopogon haemodoraceae* (snake's head) (of-t-o-pogon). I have seen this plant grown as a stove greenhouse plant. By this I mean that it can be planted in a herbaceous border. It is thus classified as a half-hardy perennial. The authoritative description continues as follows: Culture: herbaceous half-hardy perennials with racemes of small flowers and narrow leaves. They are useful for pot culture or for borders but not very ornamental culture.

"Propagation: they are propagated by division in spring and should be grown in sandy soil. In winter they should be kept under glass, i.e. lifted from border and grown under glass in pots. Species: *Ophiopogon intermedius*; *O. jaburan*—there is a variegated variety; and *O. japonicus*—this is the variety (sic) featured in the article by B. Whiteside. The variegated form is best for pot culture. All flower from June to August with violet flowers. 1-1½ ft. *O. japonicus* is known as Japanese hyacinth.

"At present I have ten plants, variety (sic) *japonicus*, of which one is being grown as a pot plant. The remaining nine are in my various tanks growing quite happily at the moment. Whether these plants will adapt themselves to aquatic conditions for any length of time is questionable. I first came across them on one of the leading house plant nurseries when employed there as a propagator in 1955. Of late I have not seen the variegated form appearing on any commercial nurseries. I agree with Mr. Whiteside that if the plant is adaptable to aquatic conditions for a long period, at 35p each the plant is not expensive.

"I am prepared to give information regarding these plants and in which book they are mentioned, but fear that the edition may no longer be in print. Any reader wishing to correspond with me on this subject may do so, when I shall willingly pass on any information if I am able." (Mr. Briscoe's comments are interesting. I wonder if some of his comments are quotations from a book? Readers are reminded that one should always acknowledge the source of quotations, i.e. author, title of book or magazine, title of article, if relevant, name of publisher, and date of publication. An example would be: Hervey, G. F. and

Hems, J. *A Guide to Freshwater Aquarium Fishes*. Hamlyn Publishing Group Limited, 1973.)

While on the subject of plants I must offer a sincere word of thanks to a fellow contributor to this magazine, Dr. Vivian De Thabrew. Vivian, whom I have not yet had the pleasure of meeting despite an abortive attempt last month when I managed to lose his address and telephone number, is, amongst other things, a botanist who occasionally manages to get out into the 'wilds' to collect common, uncommon and very rare plants—and to observe them growing in their natural habitats. I need hardly say that he pointed out to me the necessity to conserve rare and uncommon plants and obviously he does not collect rare plants if by doing so he could damage or endanger the remaining specimens. For the same reasons he does not disclose the names of the places where he manages to discover rare plants because of the possibility of unscrupulous people going there to remove or destroy them.

Vivian knows of my interest in aquatic plants and recently he very kindly sent me some specimens of *Aponogeton* species. I was both thrilled and delighted to receive two rhizomes of *Aponogeton rigidifolius*, a tuber of *A. echinatus* and two tubers of *A. echinatus* var. *purpurea*, a purple leaved variety that is very rare. Dr. De Thabrew supplied me with Plant Information Pamphlets on the plants and I am carefully cultivating them in four different tanks. They are natural specimens—not artificially forced in tanks—and are slowly growing at what I assume is their normal rate (the *A. rigidifolius* is growing rather more strongly than the other three plants). I look forward to being able to report on their progress in the coming months.

Master B. McFayden is 15-years-old and resides at 34 Brownside Drive, Glasgow G13. He says: "In reply to your mentioning the blind cave tetra in the May issue I would like to tell you of my experience with it. I purchased the fish in my local dealer's for a reasonable price. I liked the fish at first but soon grew to despise them for at feeding time one of them began chewing the caudal fin of my male guppy, while the other attacked; however, they are excellent scavengers and I was amazed how they steered clear of other fish.

"Three months later my zebra danio was making their lives a misery. They finally jumped out of the tank during cleaning.

"I would also like to tell you of the time my sharks nearly spawned, I think. Two nights after I had put in a new red-tailed black shark they immediately began rubbing against each other with one going upside down. I tried putting in a flowerpot but nothing happened. By the way, they are only over 2 in. in length. Also, I would like to point out that the society of which I am a member was established in 1927 and is the oldest in Britain—not the Croydon A.S., April issue."

Mr. D. Morris lives at 3 Duchess Drive, Helensburgh, Dunbartonshire, Scotland, and he writes: "I would



Labeo (shark) species.

like, through your magazine, to show my appreciation of the quick and efficient service of Thomas's of Halifax, to whom I returned a defective heater. In this day and age, when we seem to have so much bother with after sales service, this company exchanged the heater and also sent me two tins of fish food, all within four days of my sending it. I would recommend this company to all your readers."

Mr. Lindsey Harrison's home is in South Wales—at 31 ffordd Bryngwyn, Garden Village, Gorseinon, Swansea. (Despite being a lover of Dylan Thomas's *Under Milk Wood* and its beautiful flowing language I'm concerned about the lower case 'f' with which 'ffordd' begins. . . .) Mr. Harrison is 16-years-old and has been keeping tropical fish for seven years. He writes: "At present I have eight tanks containing breeding pairs of *kribensis*, convicts, keyholes, *Haplochromis burtoni*, and *Telmatochromis temporalis*; also some young jewels and *Melanochromis auratus*. Not really knowing which fish you would find most interesting, I chose the ones which bred yesterday—my pair of *H. burtoni* (Burton's Nigerian mouthbrooder).

Kissing gourami—*Helostoma temminckii*.



"The spawning went as follows. The pair moved to the corner of my 24 in. x 12 in. x 15 in. tank and started to encircle each other with lightning speed. Then they jerked to a stop and the female picked up some four to five large, brown eggs. The male shook like a leaf and the female nudged his anal region. This was repeated a number of times—according to the size of the fish, mine being 3 in. The fry do not hatch for three weeks, during which time the female takes no food. I will send more correspondence as each pair breeds, and if I can get a good camera photographs will follow. Why are there no young—under 18—or Welsh people in the *Meet the Aquarist* section of the magazine? I hope you can put this right."

Thank you for your letter, Lindsey. I can assure you that there is no bias in *Meet the Aquarist* against either young people or the Welsh. I felt that young readers were being ignored; and I felt that readers in N. Ireland were being ignored. To try to rectify both in one go I interviewed a keen, young reader in N. Ireland; Very often luck rather than policy determines whom I shall interview—and I speak for no other contributors to *Meet the Aquarist*, whether those who interview themselves or those who interview other aquarists. I live in N. Ireland so that provides me with an opportunity to interview readers in that region—if they don't live too far away from me. I earn my living by teaching teenagers so I'm in contact with many of them. I also interviewed an older reader in London because sometimes I visit London and I like to meet aquarists from different parts of the country. Unfortunately I have never had the pleasure of visiting Wales; and about ten years have passed since last I was in Scotland. Those are my reasons for not having managed to interview a Welsh or Scottish aquarist for *Meet the Aquarist*. Perhaps our magazine doesn't have any regular contributors from either of those countries. If I can ever afford a trip to Wales I hope you'll invite me along, complete with my camera, to interview you. Obviously most of our regular, British contributors must live in England.

Mr. P. Roffey resides at 63 Millway, Mill Hill, London NW7 3QT. He writes: "...My success with fish photography is due in part to my five years with the Tropical Marine Centre. Whilst learning about the importation side of the hobby I acquired a basic knowledge of marine photography. The equipment I use consists of an S.L.R. Zenith camera with through-the-lens metering, a 52 mm. lens coupled with extension tubes when needed for close work, electronic flash, and a tripod when needed.

"Whatever camera is used experimental shots should be taken with different settings, i.e. shutter speeds, with or without the use of flash, one or two *f* stops either way, or any additional lighting, recording the details on each for comparison. Care should be taken when using flash or additional lighting equipment, i.e. photo floods, spotlights, etc.,

as reflections from the glass can easily ruin an otherwise perfect picture. Another problem can be caused by algae or fingerprints.

"If focusing is found to be a problem, as is often the case when working with a shallow depth of field on a moving subject, try focusing on a predetermined area—rocks, plants, etc.—and take photograph when the fish enters the framed area. By studying the fishes' swimming patterns and watching for particular places they like in the aquarium, you can accurately predetermine where the fishes will go next.

"A useful trick is to confine the fish in the front portion of the tank by a glass partition held in place by suction cups, but being careful to allow the fish room to turn without banging on the glass. This method can be most satisfactory for photographing fish that would otherwise hide away. I hope some of the above will be of use to readers thinking of photographing fish for the first time."

Photograph 1 shows a shark species, photograph 2 a kissing gourami, and photograph 3 a pair of platies. Please drop me a few lines if you have kept any of these fish—and details if you have bred them.

I don't watch television very often; but recently two aquarist friends told me that they had seen Mr. L. Belshaw on Terry Wogan's BBC 1 comedy-game show 'You Must Be Joking!' The next letter concerns Mr. Belshaw.

Mr. R. Freestone, B.Sc., lives at 50 Bisham Drive, Abbey Park, West Bridgford, Nottingham. His letter is the type that I could easily have placed quietly in the large pile of unused letters that occasionally build up because of lack of space on the printed page; but I've decided to publish Mr. Freestone's letter because I feel he's perfectly entitled to hold his view and criticise me—just as I'm equally entitled to offer what I'd call an explanation rather than a defence. Mr. Freestone, a science graduate, says: "I feel compelled to write to you following your never-ending saga about Mr. Belshaw and his liver flukes. I do not doubt that his conclusions are scientifically wrong and his experimentation misguided.

"However, I strongly object to your method of belittling Mr. Belshaw through the hobbyist press. You seem to enjoy correcting his spelling and grammar, and go to great lengths to show your readers that you are a more capable writer. You should be, as you are the journalist. To my mind you should act as an editor and not as an English literature examiner.

"Following your column in November 1980 (*sic*) I contacted Mr. Belshaw following the mysterious deaths of a community of Malawi cichlids. I am a recent recruit to the aquatic hobby—approximately one-and-a-half years' standing—and I found him very helpful during this rather painful experience of losing fish. I believe Mr. Belshaw has experiences with fish diseases which he is trying to share with other aquarists. I am far more wary of these so-

called 'experts' who set up small, private practices which are in general very inaccessible and expensive to the average hobbyist.

"A hobby thrives in whatever area because of hobbyists helping and guiding each other. If in future you feel compelled to criticise a person who has written (to) you, could you do it with a little more respect and professionalism. After all, it is people like Mr. Belshaw et al who enable you to write three or four pages of interesting words without a deal of creativity from yourself."

I should like to take up a few points, Mr. Freestone. The "never-ending saga" is not my invention. Mr. Belshaw, you and other people have sent the letters for publication. Most of us like to see our names, our words and our opinions in print. I correct spelling and grammar when I find it necessary to do so; I quite enjoy doing so, in general, because I earn my living as a teacher of English language and literature. I am also an examiner in



Red wagtail platies.

English literature and language. I am sorry if you feel I should not act as such because such I am. I am not a (or "the") journalist. I have no doubt that "Mr. Belshaw has experiences with fish diseases which he is trying to share with other aquarists." I'm always pleased when I hear about one aquarist helping another. You are perfectly entitled to be wary of "so-called 'experts' who set up small, private practices. . . ." I'm always happy to take the advice of an *expert*. I know a couple of experts in animal diseases who have small, private practices and whose fees are not low. The couple whom I know in my area are called vets. One looks after my dog extremely well—although he does not claim to be an expert in fish diseases.

Mr. Freestone has severely criticised me for criticising Mr. Belshaw's findings; in an earlier issue Mr. Jerzy Gawor, B.Sc., M.I.Biol., took me to task quite severely for actually publishing Mr. Belshaw's letter. Both extremes suggest that I may have hit the balance just about right.



Barbus aurilius—the longfin barb.

I respect all my readers and enjoy receiving letters from them. Were I to publish only those written in perfect English *W.Y.O.* would be very short. Were I to show you some of the original letters as I received them you would realise that producing *W.Y.O.* involves a reasonable measure of creativity on my part. If I were subtracted you'd be left with a readers' letters' page. The fact that *W.Y.O.* has been a very popular monthly feature since I began it fourteen years ago surely says something. I'll let other readers decide what.

I had an interesting experience recently when, on responding to a knock at my door, I discovered a young lad and his mother who had been re-directed to me after visiting a local vet. The little boy was clutching a jam jar containing two badly-fungused sticklebacks and his mother quickly apologised for the visit and explained that her young son was upset because the sticklebacks in the (natural) pond in their garden had developed a nasty disease. I offered some advice and a bottle of 'cure'

but the mother insisted that she would buy a container of the cure from a shop rather than accept a gift of the half-used container from me. I hope that the pair, whose names I don't even know, managed to solve their pond problem involving the sticklebacks. I must have been about the young boy's age when, a good many years ago, some sticklebacks and, later, a goldfish got me hooked as an aquarist.

Photograph 4 shows the longfin barb, *Barbus aurilius*. Have you spawned this attractive species?

For next time please send me your opinions on any of the following: (a) livebearers; (b) *Aponogeton* species; (c) breeding white cloud mountain minnows; (d) aquarium lighting and plant growth; (e) new aquarium equipment; and (f) public aquaria that you visit while on holiday.

I hope that younger readers waiting for C.S.E., or G.C.E. 'O' or 'A' level results will not be disappointed. Good luck! I look forward to receiving a letter from you this month.



Plant Queries

by Vivian
De Thabrew

I have a 27 in. x 12 in. x 12½ in. tank in my living-room. I have two goldfish about 3 in. long in it. I have gravel in the bottom of the tank, a small stone and bridge bought from an aquarium shop and a small clump of Elodea tied in a bunch with the stone holding it down. I've tried planting the Elodea, but the fish pull them up. Is there a way of planting so that the fish can't uproot the plants? The tank is lit up as it's to one side of the window, which tends to be a dark corner. I have no air pump. I feed only twice a day on flake food, and renew some water once a week. I feel my tank looks so bare. What can I do to make it look pretty? I don't like plastic plants very much.

The best way to anchor your Elodea would be to bunch them with a thin strip of lead or lead wire and plant them about 2 in. deep, with a few small stones round the base of the bunch. This will secure the plants. Elodea roots quickly, and therefore once the roots establish in the gravel it would be difficult for the goldfish to pull it out.

Other good plants suitable for your tank are: *Hygrophila polysperma* (Long-leaved Waterwort), *Ludwigia palustris* (Water Purslane), *Hydrilla verticillata* (Water Serpent) and *Ceratophyllum demersum* (Common Hornwort). All these species grow well and form dense clusters of foliage. As these plants branch out and grow tall, you can prune them, that is cut the top few inches of the stems and plant these to produce new plants.

I would like some more information on an article in the July magazine regarding the choice of planting media. The one I am most interested in is the clay and sand mixture. Could you please define the following: (1) "Good granules of hard clay", and where it could be purchased (a friend of mine manufactures clay pottery, would this type of clay be suitable?). (2) "Coarse river sand". This may seem a silly question, but I imagine some aquarists scooping buckets full of sand from their local river and putting it straight into the tank. I would have thought this very dangerous, especially where fish are concerned?

The tank housing this planting media will also have fish. The fish are South American Dwarf Cichlids of the genus *Apistogramma*. These fish in general require a temperature of around 80°F and

higher for breeding. What plants would you recommend for this temperature? The water in the tank is DH3, pH 6.5.

With reference to my suggestion in the Plant Queries in the July issue of the *Aquarist* to use a sand and clay mixture any type of clay will do. If you get some garden clay, make it into several balls or lumps and sun-dry it. These can then be placed under the gravel immediately below the plant roots. This system is excellent especially if you grow specimen plants such as Cryptorines. To be honest, I have not had the opportunity of using pottery clay, an expensive commodity. But I cannot see any reason why it should not be used, as this type of clay should contain all the nutrients and mineral elements which are characteristic of clay.

By "coarse river sand" I mean the larger granulated river sand which has not been mechanically washed, but simply rinsed. This sort of sand can be obtained from the builders' yard. I think it is called "coarse sharp sand". You must rinse this sand several times to remove the surface loose clay and impurities. When you set your tank up in this manner, it will take about a day to achieve a crystal-clear water condition, but it is well worth it. Provided the sand is collected from a non-polluted riverbed, there is very little danger for fish.

Most tropical aquatic plants will tolerate temperatures around 80°F, but will have a shortened life-span. There are only a few species available to the hobbyist which thrive at this temperature range. The following is a list of suitable plants: *Aponogeton undulatus* (the true species, not the one commonly available); *Cabomba aquatica*; *Cryptocoryne cordata*; *Cryptocoryne griffithii* (not the species sold here coming from Singapore); *Echinodorus cordifolius*; *Heteranthera zosterifolia*; *Hygrophila polysperma*; *Hydrophila angustifolia*; *Limnophila indica* (not the species which is commonly sold by the dealers); *Microsorium pteropus*; *Synnema triflorum*; *Vallisneria spiralis*.

If you are using undergravel filters you can certainly use peat as a layer under the gravel or sand layer in your tank. Simply soak some peat for a day or two, then squeeze it out and sandwich it as a layer with the gravel or sand. Provided the overall depth of the tank bottom is at least 3 in. the plants should grow satisfactorily. Furthermore, the peat will help increase the acidity. As I suggested in the October issue last year, you can also use the water in which the peat was immersed in your tank after filtering it well.

PRESS RELEASE

Derbert Filter

Due to the outstanding success of the Derbert Filter it would appear that virtual replicas of this equipment are being manufactured and distributed from other sources. The Derbert Filter is protected by copyright and pending legal action on this matter we advise hobbyists to beware of imitations. The genuine article can be distinguished by the Derbert trade mark which is incorporated in the advertisement appearing in this magazine.

NORTH AMERICA's largest minnow, the Colorado squawfish, is so restricted in range that plans for a new cooling water dam on Utah's White River, in order to develop local oil shales and tar sands, endanger not only some of its last haunts, but those of 3 other White River rarities, the humpback and bony chubs and the razorback sucker. Once abundant in the Colorado River systems, these fishes have been almost wiped out by industrial changes in the ecology and alteration of water-temperatures by impoundments.

A federal Endangered Species Act prohibits the destruction of habitats critical to listed species like these. Ecologists ask for the dams to be resited to the least destructive places.

Ancient fish

One of the oldest, historically, of North American fish, the quaint paddle-nosed or spoonbill fish *Polyodon* of the Mississippi Valley was swimming in the swamps of Carboniferous and Devonian times. Despite a length of 20 to 23 ft, nearly a third of which is its elongated, flattened upper jaw, it is sometimes kept in large aquaria. It has a mouth somewhat like a sturgeon's, but with tiny teeth when young and it uses its sensitive 2 ft. long "nose" to detect small planktonic prey in the muddy, gravelly river bottom, and by cruising around with its huge mouth open. An intricate arrangement of gill-rakers replaces the early teeth to filter its microscopic food: *Daphnia*, diatoms, etc.

This scaleless tiny-eyed fish has changed little over the last 3 or 4 million years. Its nearest relation is in China's Yangtze River, but Mississippi fish nowadays seldom exceed 5 ft. in length and 100 lb. in weight. It probably uses its "paddle" not for swimming but as a sensitive detector of river currents and underwater obstacles, maybe linked with some sort of sonar. Though boneless like sharks, it is not related to them. It had few natural enemies until man arrived with his industrial changes like hydro-electric channels, and over-fishing for its roe. Harmless to man, its activities were greatly exaggerated by fictional reporters. Though the fish increased in the new lake of the Ozarks and Truman Dam formed by dams, the population-explosion was short-lived with the arrival of sport-fishing. It is now feared that with only 10 or 20% of its former population, the species may not make the 21st century.

Only in recent years has its reproduction been worked out. Females were first described spawning on gravelly bars in April 1961. Running water is necessary to keep these gravels clean where the eggs stick to stones or rock. They must be flooded to at least 5 ft depth by spring floods with the temperature of the water about 60 deg F. This occurs on only a few days. Otherwise the female paddlefish reabsorb their eggs and move down stream without spawning. Artificial rearing from fish in steel tanks at Blind Pony Hatchery, near Sweet Springs, first needs injection with pituitary-gland extract. Without this, the females will not lay eggs. Unlike other freshwater fish, these are in a single sac, all deposited at one time. The roe is held in a series of flat leaf-like layers within the



by
Eric Hardy

ovaries, released individually over a day or more and immediately fertilised by milt at the hatchery. The eggs are then put into large test tubes at constant temperature to hatch in about a week, and the fry transferred to outdoor rearing ponds rich in plankton. The survival rate is small, and it is hoped to increase this for restocking waters, but suitable waters are few.

I have mentioned before the misleading and erroneous statement, due to relying only upon published material, alleging an "absence" of recent records of Cheshire grass-snakes, in the Systematics Association's 1974 textbook on *The Changing Flora and Fauna of Britain*. A Cheshire friend who observed them visiting a farm-pond at Church Minshull last summer had one hibernate this past winter in the loose stonework of her front porch of a well-heated house. On the sunnier days it came out to bask in the open, retreating in colder spells. We had several records, having worked the species for over 50 years in the county, but were just not contacted.

Flatworm Nussy

The discovery of a new European flatworm in Loch Ness recently splashed no headlines across the daily press which for nearly 50 years has published unproven, unnatural history and "after-vision" about that most absurdly imagined water-creature, the Loch Ness Monster. After all, *Phagocata woodworthi* would need much introductory explanation before monster-hunters realized the zoological importance of this American freshwater animal which slipped into Europe unknown upon equipment imported in recent years from U.S.A., to hunt the fictitious monster. Nobody had proved that the sightings and reportings since

I first wrote of it in the Dundee Courier in the early 1930s were even the same thing, much less some prehistoric creature dating from before the loch was formed!

The discovery was made near the shore near Invermoriston during an investigation of the invertebrates living along the shores of the loch by the Institute of Terrestrial Ecology. Nor was it a single specimen they found, but 97% of the tiny flatworms were the new species known previously only between the Delaware River and Ontario in northeastern North America, where it inhabits ponds and rivers. These simple, tiny free-swimming creatures, much simpler than earthworms, are easily baited to raw meat in waters. Some 3,000 flatworms evolved, but little is known of the ecology of this American invader except that this triclad is unlike other British flatworms in being polypharyngeal. Several specimens of course are being kept in aquaria. Some of the best known flatworms, the flukes and tapeworms are parasites and the turbellarians or whirl-worms so named because of the eddies caused by their lashing cilia or thread-like organs of mobility, belong to different groups. Phagocana's nearest relatives are among the turbellarians, the planarians, like *vitta* in north British waters. Their beavy used to fascinate the early microscopists. Some inhabit damp land as well as water and one of the early introductions from foreign sources was the two-striped yellow and red species brought to Victorian hot-houses with exotic tropical plants.

Canal mystery

A mystery among the waterlife along the canal near Wigan, lasting several months of recent years, has been solved in simpler terms than was expected. Naturalists had been finding partly chewed freshwater mussel-shells pushed under blackberry bushes along the canal from Platt Bridge to Parbold, marked with the teeth of a small mammal, but no indication of what could bring them up from the deep water and put them there. Only occasionally are swans seen there and though they grub down for pond-mussels, the water is too deep there for them. Suspicions centred around possibly an otter, or a mink, visiting the water, and secreting the shells, for both these mammals are known to take freshwater crayfish.

The sea-otter of the Pacific feeds regularly upon shellfish

like oysters. Such theories were supported by a watcher seeing an animal like otter or mink in the water near Abram one evening, only to have it disturbed by youths firing air-rifles before he could identify it. However, the mystery was traced to the cleaning of the canal over long periods of time, when a boatman raking out surplus weeds raked up mussels and threw them beneath the bankside bushes. Here, in the night, rats or some other wandering mammals nibbled the shells to eat the odorous decaying mussel within. So no new record was added to the aquatic fauna of the canal!

Teaching aid

Biology teachers will find most useful a new 54 page publication of the Institute of Terrestrial Ecology, *The Culture and Use of Free-Living Protozoa in Teaching*, by Frederick Page (£2.10) which is a practical guide to keeping small collections of protozoa like *Amoeba* and *Paramecium*, etc. well illustrated with photomicrographs. Using various media, ciliates are obtained by the common method of infusions with hay, dried lettuce leaves or the cereal preparation Cerophyl, the latter the quickest, temperature being the limiting growth factor. Cultures are kept out of direct sunlight. The protozoans are treated species by species and there's a simple classification key to over a dozen "classes." Maize kernels for instead produced the best cultures of blue *Stentor*. The notes are most useful where colleges cannot conveniently buy in cultures. From the same source, Dr G. J. Morris's 27 page introduction to *Cryopreservation* (£2) the low temperature preservation of cultures without the science-fiction ideas of preserving humans in cold storage! It ranges over low temperature preservation of spermatozoa for artificial insemination, mammalian embryos for implanting foster mothers, seeds to preserve a reserve of rare plants blood cells for transfusions and cultures of yeast bacteria, and tissue cells. It covers freezing and thawing techniques, shrinking and rehydration, alterations in pH, etc. Among colour illustrations a plate shows a snake with its mouth held open to treat a surface tumour on the lower jaw with a spray of liquid nitrogen to freeze it. Another colour plate shows the effects on freezing and thawing on *Spizogrya* during rates of cooling and warming.

OSCAR

G. Robinson



FURTHER NOTES ON AGGRESSIVE BEHAVIOUR OF DAMSELFISH

by Chris Lerwill

Illustrated by Laura Lerwill



Fig. 1

I HAVE PREVIOUSLY described (*Aquarist & Pondkeeper*, May 1979) some observations on the aggressive behaviour shown between a number of species of pomacentrid fish. In this article I shall describe further the aggressive behaviour of the Humbug Damselfish and the relationships which developed in a particular group of damselfish.

In my previous article I described the aggressive behaviour of damselfish as consisting of a rapid approach with fins held erect, followed in some cases by butting and biting. Aggressive (and courtship) behaviour in many species involves colour changes, and damselfish are no exception. The following is a description of the behaviours observed after the introduction of one Humbug Damselfish (*Dascyllus aruanus*) into a tank already containing one individual of the same species. Since the sexes of the individuals was not known it may be that some

of the behaviours have a courtship component, although in many species initial courtship behaviours are very similar to aggressive behaviours. Initially the intruder showed aggression towards the resident, consisting of erect-fin approaches and in addition a greying of the white areas of the head and back. At this stage the resident had retreated into a piece of coral, probably as a response to the disturbance caused during the introduction. Within a few minutes, however, the situation was reversed with the resident now showing aggressive approaches and the intruder showing defensive or submissive behaviour. The resident now showed a similar, but more extensive, greying and the intruder returned to the normal coloration.

The defensive behaviour shown by the intruder consisted of the adoption of an oblique sideways posture (Fig. 1). This posture in itself is probably an indication

of submission preceding retreat. However, it was frequently accompanied by fanning movements of the pectoral fins and flicks of the tail towards the aggressor. These movements are probably of an aggressive nature making the whole behaviour defensive. Similar behaviour is frequently shown by a fish close to its "home" site on the approach of another fish. On occasions both fish showed reciprocal sideways posturing and in these situations a "purring" sound was emitted, although it was not clear which individual was vocal or indeed whether both were.

The behaviour described occurred frequently for an hour or so, by which time a relationship had developed with the resident being the dominant individual and maintaining its original "home" site, while the intruder took up residence in a piece of coral at the opposite end of the tank. Aggressive encounters were then less frequent although they did occur from time to time.

Some two months later the dominant individual died and the remaining individual immediately took up residence in the coral now vacated indicating that this was a favoured site within the tank. This illustrates one of the functions of aggression and territorial behaviour. Those individuals showing sufficient aggression, and thence territoriality, can maintain occupancy of the best sites.

Some observations on interspecific territorial behaviour

were made on a tank containing one each of the Humbug Damselfish (*Dascyllus aruanus*), the Cloudy Damselfish (*D. carneus*), the Domino Damselfish (*D. trimaculatus*), and the Electric-blue Damselfish (*Pomacentrus caeruleus*). These four individuals had been allowed to settle and to stabilize their inter-relationships before specific observations were made. In order to analyse their territorial relationships I used time-lapse cine filming for a period of a little over half an hour. The film was then examined frame by frame, and the position of each fish on each frame was recorded. The positions occupied by each fish are shown in Figure 2. As can be seen each fish moved within a limited part of the available space. The Humbug stayed mainly above the coral at the right, the Electric-blue around the base of the same coral, the Domino mainly at the front of the tank at the right and centre, and the Cloudy principally at the left of the tank. These territories interlock like a jigsaw with very little overlap. Lack of overlap of established territories means that actual aggression between individuals is reduced and occurs only where the territories meet. Although the Humbug Damselfish is a very aggressive species and dominates the other species, it nevertheless seems to "respect" the territories of others. In these observations the Humbug spent less than one per cent of the time in the left half of the tank.

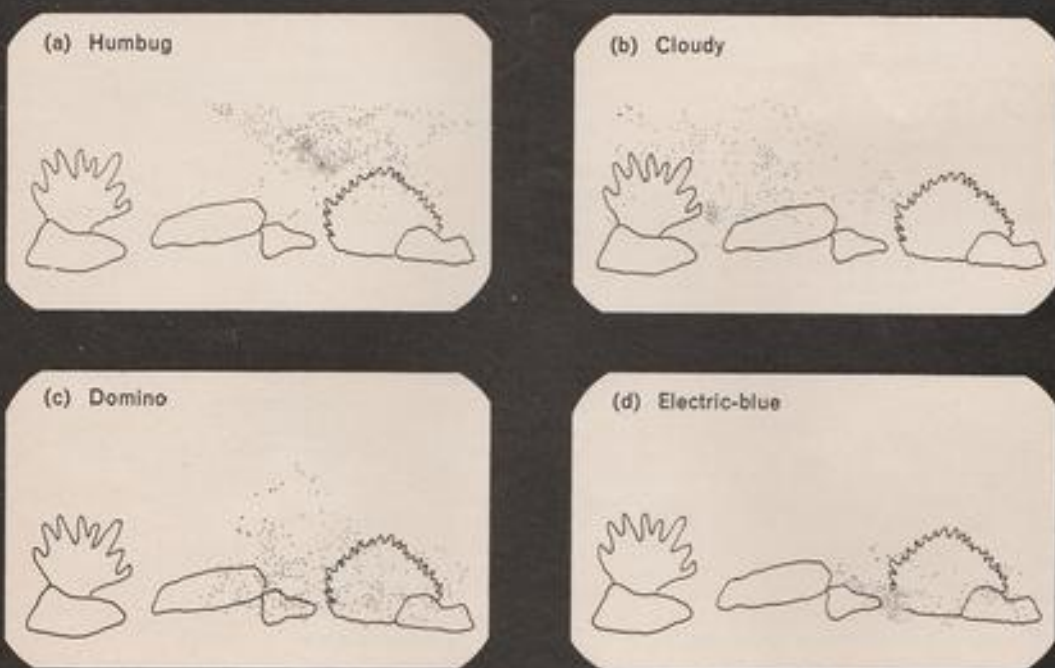


Fig. 2



Koi Queries

by
Hilda Allen

I am thinking of making a glassfibre pond and would be glad of any advice you can give on this subject.

I hope this method will reduce the time taken to construct and avoid the other problems associated with a concrete pond.

I know that small garden ponds have been successfully made with glassfibre following the recommended practice of first lining the hole with aluminium foil and finishing inside with three successive layers of a chopped strand mat bonded together with the usual resin and hardener. The top layer can be a fine surfacing tissue to give a smooth finish but for most purposes the final application of one or two extra coats of resin will be adequate.

From work done on my own large concrete pond, which suffered damage by shrinkage of the clay sub-stratum as a result of the disastrous drought of 1976, I am qualified to say that cracking can be repaired with a liner of glassfibre. It was considered that to add a colouring pigment of choice to the resin appeared to give this more body as well as providing a better surface finish.

In my opinion, a large pond suitable for Koi would necessitate first constructing a shell of garden-wall type brickwork, concrete blocks or similar within the excavation and then lined with glassfibre as previously described. No more resin and liquid hardener should be mixed than can be used within say 20 minutes, and the amount of hardener that can be safely added before the mix begins to set will vary according to the ambient temperature.

It is called 'learning by experience' when faced with half a bucketful of unusable rapidly-setting resin mix after 30 minutes! Also, a quantity of low-grade or reclaimed acetone will be essential for brush-cleaning etc.

I was less than happy about the effect of resin used to bond the glassfibre and here I would advise an ageing and water-changing process for 6 to 8 weeks before testing with a couple of small, expendable fish.

A filter and gravel bed system can be added in the later stages of water-changing to avoid any chance of contamination. The filter should be first flushed through to waste and then operated continuously for at least two weeks to become settled and the general hardness to be reduced to

about the same level as mains tap water. Simple test kits are available for this purpose.

It always takes time for a new pond and water to become established as preferred by Koi, and there really are no short cuts to what will happen in nature. If the fish show any signs of distress or lethargy during the early days then substantial water-changes must be made until some improvement is seen in their behaviour. Koi should be treated with consideration and everything else with suspicion. Pollutants are a well-known hazard to fish.

A good Koi pond should have some form of bottom-drainage and the necessary plumbing work done before making the pond.

The name and address of a leading supplier of glassfibre materials and tools has been sent to you and a comprehensive brochure containing much useful information is available.

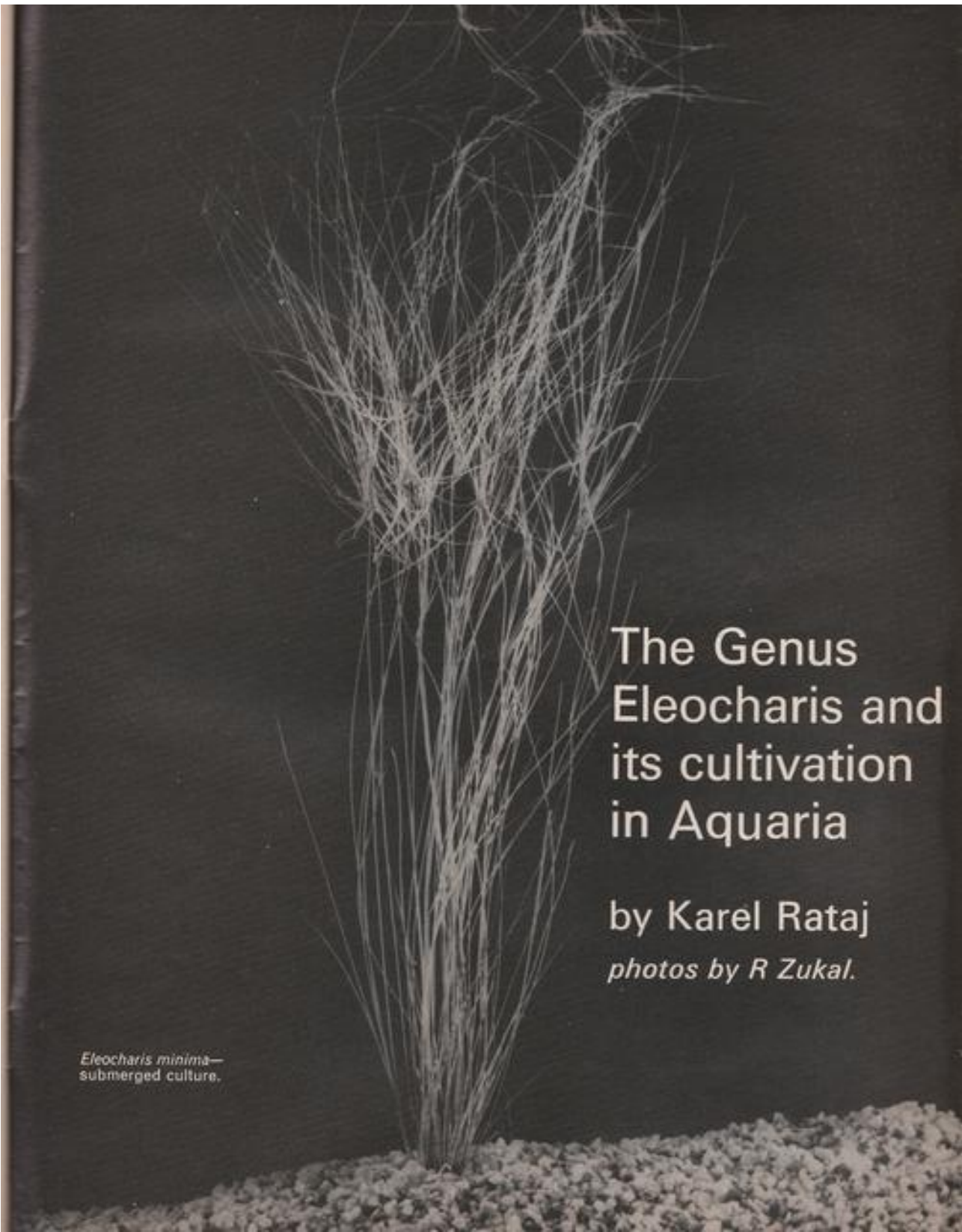
Since purchasing a dozen small Koi of between 3 and 4 inches in length in November of last year, I have already lost five for some unknown reason. I would appreciate your opinion plus the name and address of a reliable supplier in my area. My pond measures 12 feet x 6 feet.

I am sorry to hear of your losses, but I think you were unwise to buy such small Koi in November which was a very cold month last year. These small fish would be only a few months old from the Far East and considerably stressed before purchase. It is possible that they may have been starved before shipment, drugged for the journey, possibly overcrowded and subjected to various changes of water, temperature and surroundings on their way to your pond.

By over-wintering them indoors to provide extra warmth you may have saved more, but generally I believe it makes better sense to buy fewer, but larger, stronger Koi during the summer months. These fish then have several months feeding to enable them to withstand the rigours of an English winter which will be longer than winters in Japan etc.

Buying Koi is, and always has been a risky business; the buyers should look for healthy fish and note the conditions under which the Koi are offered for sale, clean or otherwise. Some dealers are responsible and attempt to look after their stock whilst others rely on a quick turnover so it is up to the purchaser to shop around. On the other hand, some garden ponds may be small, dirty, overcrowded or generally unsatisfactory for Koi so it is impossible to lay the blame for losses in any one direction or for me to recommend suppliers selling Koi guaranteed not to die.

Anyone buying Koi at any time is urged to treat them with care. The bag should be floated on the pond to equalise the temperatures for at least 30 minutes, after which the bag should be opened and quantities of pond water added to that in the bag to even out any differences of water quality, pH etc; in other words avoid any sudden shocks for the Koi. A little time spent will be well worth the effort.



Eleocharis minima—
submerged culture.

The Genus
Eleocharis and
its cultivation
in Aquaria

by Karel Rataj
photos by R Zokal.

THE FAMILY Cyperaceae includes many plants which live in the more temperate parts of the sub-tropical and tropical regions and are often subjected to flooding in the natural state. Nevertheless, it has been established that only very few plants of this family are able to withstand a permanent submerged existence, particularly in the relatively warm water of the home aquarium. So, out of the whole family, only the genera *Cyperus* and *Eleocharis* (sometimes named *Heleocharis*) are cultivated in aquaria.

The genus *Eleocharis* has about 150 species which are found from the tropics to the arctic regions of both hemispheres. Only eight species grow in Europe. They range from very small to medium-sized plants which are found on the banks of rivers or in the midst of still or slow-moving waterways. Many of them can withstand big fluctuations in temperature and adapt themselves to cold or warm waters. In their form they are very different from other aquarium plants and provide an attractive contrast to them. Most of them resemble grasses but, as already mentioned, they belong to the family Cyperaceae (Sedge family) and not the grass family (Gramines).

A great number of species of the temperate zone can be grown in the aquarium. For example, *E. ovata* (Roth) R.Br., which is hardier but an annual plant which dies in winter. *E. palustris* (L.) R.Br. is longer lasting and equally hardy, but it is less decorative and does not adapt as well to conditions in which the water is relatively warm. Amongst the tropical species *E. minima* is often grown and the similar plant *E. vivipara* (*E. prolifera*). Both species are often mistaken and are alike in that new readily rooting plantlets form on their leaves.

Of the species of the temperate zone the most suitable and the most popular is *Eleocharis acicularis* (L.) R. et Sch. It is found not only in the temperate zone, of course, but extends out into the tropical and subtropical zones of the whole world outside Africa. As a result it is extremely adaptable and well suited to both warm and cold water. It grows on sandy and swampy banks of waterways and is amphibious.



Eleocharis minima in its emergent form, forms the characteristic umbrellas and flowers.

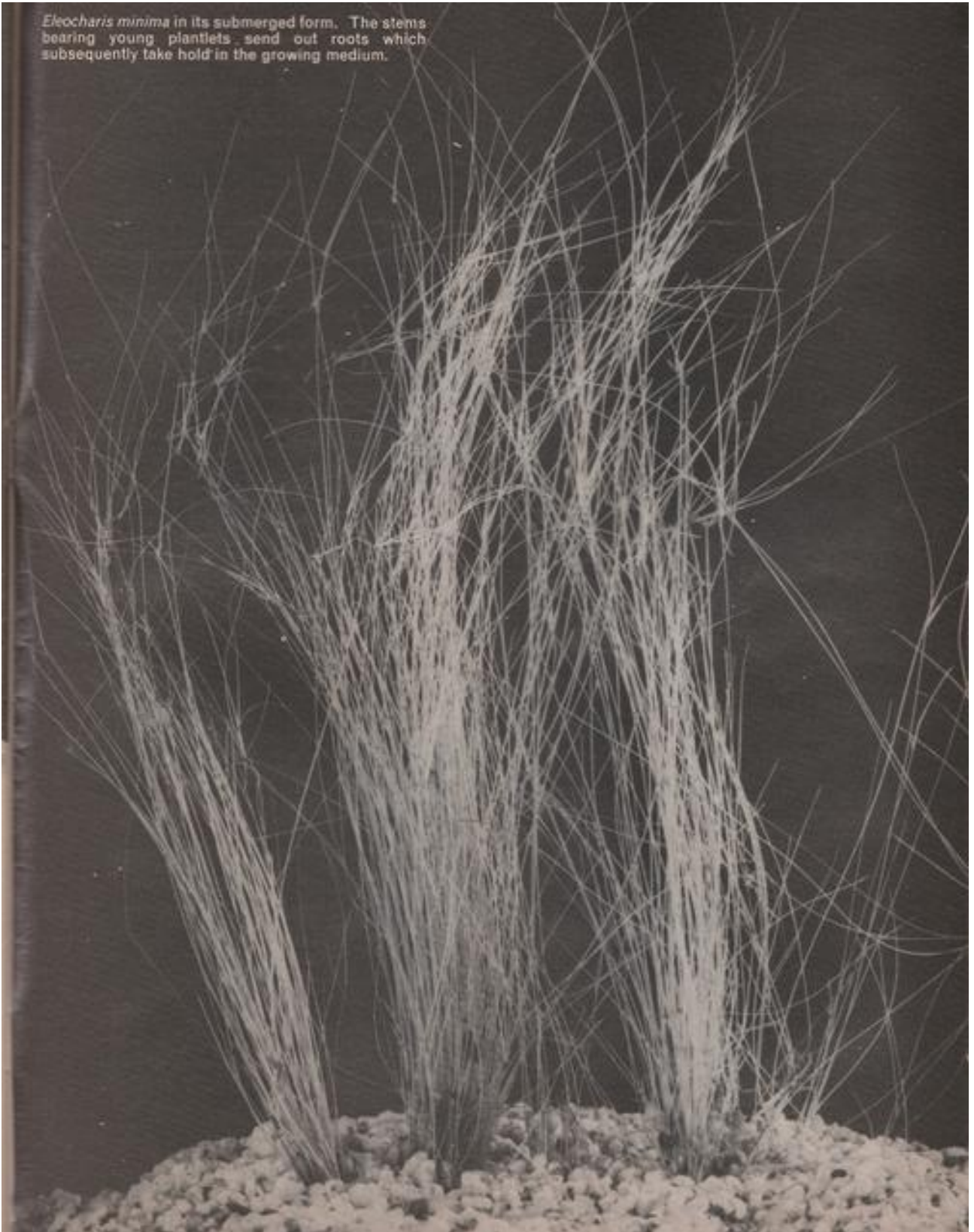
In the natural state it grows as a submerged plant when the water level is high and out of the water when there is a drop in the level of water. It takes on its most insignificant aspect where it grows on the bottom of ponds which have been emptied of their waters, forming a sparse light green covering of vegetation.

Its rootstock is spiral shaped, creeping and has long shoots which take root to form new plants. These form small clumps of thin, delicate, bright green stems. Submerged stems grow as large as 40-60 cm in good conditions, but mostly only 10-15 cm. Land-based specimens are smaller,

only 2-10 cm high, but their rootstocks are heavily branched and so a striking carpet of vegetation is formed several square metres in extent. Each individual leaf—on every plant twenty to thirty such leaves are formed—is really a stem, as in the emergent form it bears the inflorescence. The inflorescences are tiny spikelets 1-5 mm in length. They have a narrow oval shape and consist of 4-11 small flowers which protrude from the ear.

Plants from the natural state can be planted straight away in the intended spot in the aquarium irrespective of whether they are from an emergent or submerged culture. *E. acicularis*

Eleocharis minima in its submerged form. The stems bearing young plantlets send out roots which subsequently take hold in the growing medium.



needs a growing medium which is low in nutrients such as is provided by fine gravel which has been washed clean. The temperature is not critical and the plant is happy between 10 and 25°C. *E. acicularis* has need of plenty of light and should be positioned in the foreground or the front corners of the aquarium. It also needs clean water and pH of 5-7 to 7. It cannot stand water which is too acid. It is best suited, therefore, to the company of the genera *Echinodorus*, *Sagittaria*, *Vallisneria* and related plants. It reproduces by means of new shoots which are put out by the roots and these gradually form a dense expanse of new growth so that, within a relatively short period of time, the vegetation can cover a considerable portion of the tank. The plants vary considerably in the height of growth attained according to conditions. Sometimes a growth of only a few centimetres and reminiscent of a lawn is formed, at times the plants produce a size of 10-20 cm. If the vegetation becomes too thick, the plants often turn yellow. Then it is necessary to uproot them and establish a new culture. In deep water (above 40 cm) the roots often fail to develop new shoots and the plant does not form new growth. During the winter months the plant needs some artificial light, as it has difficulty in surviving the short hours of daylight in winter. Even if it perishes, most aquarists have no trouble in obtaining new supplies in the spring from our own waterways and marshes. When being collected from its natural surroundings confusion often arises and, instead of *Eleocharis*, aquarists take a related plant from shallow pond waters. This is *Isoplepis setacea*. The two plants are very similar in their sterile (non-flowering forms) and both are easily propagated in the warm water of the home aquarium. They can be easily distinguished only when growing in marshland conditions. When they are flowering the two species cannot be confused. *Eleocharis* has ears on the end of the stems, *Isoplepis setacea* flowers with tiny spikelets which are positioned on the sides of the stem a few centimetres before the tip.

Many tropical species of the genus *Eleocharis*, with stems which branch in a twisting fashion at intervals of a few centimetres, are reminiscent of an inverted umbrella. Hence the German name "umbrella plant." In the past this name has been applied to the species *Eleocharis vivipera* (= *E. prolifera*) in some reference books. It is found in the Southern United States (1) where it grows on sandy banks of waterways and in locations which are often flooded. It usually has a number of leaf whorls one above the other. The plant withstands cold water well and is suited, therefore, to both heated and unheated tanks. During the winter it perishes if there is insufficient light.

Ten years ago the director of the Botanical Institute, Dr. S. Hejny, brought back the tropical species *Eleocharis minima* from the South American state of Venezuela. Six years later when I travelled in the Amazon region in 1976 along the Maderia River from Manaus, to Rondonien, it was during a period of heavy rainfall. Jungle rivulets of clear, sparkling water could be seen from the road and in the fast-flowing waters bright green areas several square metres in size could be seen against the sandy beds. They were sterile clumps of *Eleocharis minima* up to 60 cm in height.

It is an amphibious plant which can be reproduced in both permanently submerged or emergent forms. A large number of twisting leaves grow out of the clump of fine, greyish-white roots. There are up to a hundred on one plant. They are a bright green, only 2-6 cm in the emergent form but growing larger in the submerged form, varying in size between 10 and 60 cm. In the case of rather old plants, whorls of new, shorter leaves grow on the leaf ends. In the submerged form these whorls take root, separate and establish new plants. In the emergent form, the small spikelets of the inflorescence form at the end of the whorled leaves. The fruit forms readily but it is very difficult to grow the extremely tiny seeds. The plants reproduce themselves by well developed clumps dividing, which reach a large enough diameter after a year for one to separate

a single growth into between ten and twenty new plants.

Eleocharis minima is grown in soft to medium hard water with a slightly acid to slightly alkaline pH reading. The water must be very clean and filtered if possible, as the very fine leaves are subject to becoming covered with algae and impurities suspended in the water settle on them. The plant is most likely to flourish in a mature tank containing well washed sand which has plenty of mineral detritus in it. It needs sufficient light, and experience to date has established that daylight cannot be successfully substituted by artificial light on a permanent basis. *Eleocharis minima*, therefore, is suited to an aquarium in a home which has plenty of light and with a South American biotope containing, for preference, species of the genera *Echinodorus*, *Cubomba*, *Vallisneria*, *Sagittaria* and so on. Artificial lighting can serve as a support to daylight or in order to prolong the life of the plant in winter.

The roots of these plants take a rather shallow and insecure hold in the planting medium of the tank bottom. Consequently, this species is not suitable for tanks which contain cichlids or other, rather large, lively fish. *Eleocharis* is most usefully deployed in the central or lateral areas of the tank, planted in groups. Five to seven well developed plants should be arranged in the chosen spot, planted 5-8 cm from each other.



News from Aquarists' Societies

Monthly reports from Secretaries of aquarists societies for inclusion on this page should reach the Editor by 3rd of the month preceding the month of publication.

SOUTH EAST



The Sudbury Aquarists Society held their 9th Open Show at St Margaret's Catherode School, Newden, on the 7th June. The 377 entries were judged by Mr. C. A. T. Brown, Mr. A. Blake, Mr. D. Durran, Mr. R. Bowen, Mr. P. Cottle, Mr. R. Dale, Mr. R. Paine, and Mr. C. Pannell, all of whom the society would like to thank.

Best Fish in Show (Aquarist Gold Fish): A. P. Taylor with a Botta Sidhamskoi; F.R.A.S. Championship Class C: C. Richards with a Hypheoscyron Bolito; Best Egglayer: A. P. Taylor; Best Livebearer: C. Tonna; Highest Pointed (Vinting) Society: Tonbridge (28 pts); Class B: 1 and 3, C. Tonna (Reading); 2, A. Feast (Tonbridge); 4, J. Frazon (Leicester); C: 1, P. Mose (Houghton Regis); 2, Mr. Cobb (SELAS); 3, W. Hastings (SELAS); 4, J. Part (Romford); Ca: 1, C. Richards (Sudbury); 2, M. Paxton (Basingstoke); 3, J. Part (Romford); 4, H. Johnson (Beckley); Ch: 1, C. Richards (Sudbury); 2, J. Frazon (Leicester); 3, P. Martin (Basingstoke); 4, Ann Chapman (Newham); D: 1, Mrs. R. Johnson (Uxbridge); 2, W. Hastings (SELAS); 3, P. Cripps (Newbury); 4, W. Knight (Havant); Da: 1, C. Fennis (Strood); 2, E. Jackson (Tonbridge); 3, C. Tonna (Reading); 4, M. Gibson (Sudbury); Db: 1, C. Richards (Sudbury); 2, F. Russell (Corby); 3, Dave Winder (E. Dulwich); 4, Dave Winder (E. Dulwich); E: 1, C. Osborne (SELAS); 2, P. Russell (Corby); 3, E. Jackson (Tonbridge); 4, C. Fennis (Strood); Ea: 1, C. Fennis (Strood); 2, Doris Winder (E. Dulwich); 3, J. Part (Romford); 4, Mrs. P. Edwards (EKASG); F: 1, D. Mackay (Kingston); 2, M. Smith (Romford); 3, B. Wintbridge (Sudbury); 4, H. Johnson (Beckley); G: 1, C. Richards (Sudbury); 2, J. Part (Romford); 3, C. Osborne (SELAS); 4, H. Johnson (Beckley); H: 1, C. Osborne (SELAS); 2 and 3, D. Mackay (Kingston); 4, J. Part (Romford); I: 1, Mrs. P. Edwards (EKASG); 2, A. Feast (Tonbridge); 3, D. Newell (Sudbury); 4, K. Stephenson (Riverside); K: 1, J. Part (Romford); 2, P. Scarr (EKASG); 3, C. Richards (Sudbury); 4, R. Chapman (Newham); L: 1, A. P. Taylor (Sudbury); 2, Dave Winder (E. Dulwich); 3, C. Richards (Sudbury); 4, P. Cripps (Newbury); M: 1, P. Russell (Corby); 2, C. Fennis (Strood); 3 and 4, A. Feast (Tonbridge); Nbn: 1, J. Jackson (Basingstoke); 2, D. Winder (E. Dulwich); 3, H. Johnson (Beckley); 4, C. Osborne (SELAS); No-t: 1, S. Furzedon (WDAS); 2, P. Mills (WDAS); 3, P. Martin (Basingstoke); 4, J. Edwards (EKASG); O: 1, F. Holding (WDAS); 2, C. Tonna (Reading); 3, Mrs. B. Johnson (Uxbridge); 4, C. Richards (Sudbury); P: 1, C. Fennis (Strood); 2, A. P. Taylor (Sudbury); 3, P. Chapman (Newham); 4, R. Stalwood (Newbury); Q: 1, A. Feast (Tonbridge); 2, A. P. Taylor (Sudbury); 3, Mrs. P. Edwards (EKASG); 4, Mrs. P. Cripps (Newbury); R: 1, P. Mose (Houghton Regis); 2 and 4, Mrs. P. Cripps (Newbury); 3, C. Fennis (Strood); S: 1, P. Chapman (Newham); 2, J. Jackson (Basingstoke); 3, H. Johnson (Beckley); 4, E. Jackson (Tonbridge); T: 1, C. Tonna (Reading); 2, W.

Hastings (SELAS); 3 and 4, M. Strange (Basingstoke); No-t: 1, 2 and 4, P. Scarr (EKASG); Mr. and Mrs. Hanes (Uxbridge); X-w: 1, F. Cripps (Newbury); 2 and 3, P. Mills (WDAS); 4, T. Gibson (Sudbury); U: 1, 2 and 4, P. Whiddett (Tonbridge); 3, P. Mills (Wdas); V: 1 and 4, J. Pollard (Kingston); 2, D. and P. Lambert (Kingston); 3, S. Hogan (E. Dulwich); W: 1, D. Brown (Havant); 2 and 3, P. Mills (WDAS); 4, P. Whiddett (Tonbridge).

RESULTS of the Three counties closed show held in Beckenham: Miniature Aquar: 1 and 2, Mrs. E. Stalwood; 3, D. Sindle; Large Berbs: 1, P. Cripps; 2, D. Sindle; Small Berbs: 1, C. Tonna; 2 and 3, C. Tonna; Large Characins: 1 and 2, D. Sindle; 3, D. Ford; Small Characins: 1 and 2, D. Ford; 3, M. Strange; Angels: 1 and 2, P. Abbott; 3, Mrs. J. Jones; Dwarf Cichlids: 1, S. Norris; 2, M. Strange; 3, H. Piper; Malawi: 1 and 2, R. Cooper; 3, S. Barnes; Cichlids: 1, R. Cooke; 2, P. May; 3, Mr. Scarr; Fighters: 1, J. Jackson; 2, C. Tonna; 3, Mrs. J. Wilson; Gouramis: 1, Phyllis Cripps; 2, D. Sindle; 3, R. T. Stalwood; Killies: 1, P. May; 2, P. Cripps; 3, S. Norris; Catfish: 1 and 2, D. Stalwood; 3, Pat Woodhead; Corydoras: 1, S. Barnes; 2 and 3, C. Tonna; Rabbits: 1 and 2, D. Goss; 3, M. Paxton; Danios: 1, D. Sindle; 2, Sue Abbott; 3, S. Norris; Loach: 1, M. Paxton; 2, P. Cripps; 3, D. Stalwood; A.O.V. (Eggs): 1, S. Swan; 2, Phyllis Cripps; 3, D. Ford; Pairs: 1, D. Goss; 2, J. Jackson; 3, R. T. Stalwood; Male Guppy: 1, Betty May; 2, G. Parrot; 3, C. Tonna; Female Guppy: 1, S. Norris; 2, J. Jones; 3, Betty May; Swords: 1, E. Piper; 2, S. Norris; 3, Mrs. R. Rose; Plants: 1, Phyllis Cripps; 2, C. Tonna; 3, H. Piper; Mollus: 1, J. Jackson; 2 and 3, P. Andrews; A.O.V. (Livebearers): 1, Phil Martyn; 2, M. Strange; 3, P. Cripps; Gold Fish: 1, C. Tonna; 2, D. Maskell; 3, Celia Brooker; Coldwater: 1 and 3, C. Tonna; 2, J. Jackson; Breeders (Egg): 1, J. Jackson; 2, M. Bradford; 3, D. Stalwood; Breeders (Live): 1, P. Cripps; Marins: 1 and 2, Sue Abbott; Plants: 1, P. Martyn; 2, E. Piper; 3, Betty May; Specialist Class: 1, C. Tonna (Berbs); 2, Derek Ford (Characins); 3, S. Alon Norris (Corydoras); Best Fish in show (Pseudorasbora parvius): Kay Cooke, Toulham; Best Junior, Simon Norris; Highest pointed exhibitor, Charlie Tonna; Society ratings: 1, Beckenham; 2, Reading; 3, Basingstoke.

AT the June meeting of Mid-Sussex A.S. Mr. R. Forster gave a very interesting talk on plants and showed some very good slides of ponds and show-plants. Members and a lot of new faces showed a lot of interest. Results of table show:—Marines: 1, J. Smith (Berbs); 1 and 2, P. Levine; 3, E. Blake; Characins: 1 and 2, P. Levine; 3 and 4, A. and J. Fall; Plants: 1, A. and J. Fall; Meeting held 2nd Thursday each month at Oakley Lodge, Keymer. Information from Secretary: John Smith 51, Eastbourne Road, Brighton BN1 6QZ.

RESULTS of Mid-Sussex A.S. open show on 18 June: Class AG: 1 and 2, E. A. Stalwood (Newbury); 3, Mrs. B. May (Reading); 4, Mr. and Mrs. Brill (Croydon); E: 1, C. Tonna (Reading); 2, Dave Winder (E. Dulwich); 3, P. Levine (Mid-Sussex); 4, H. Hicks (Beckley); EA: 1, P. Cripps (Newbury); 2, Mrs. Anne Hand (Croydon); 3, A. I. Feast (Tonbridge); 4, E. T. Teaser (SLAG); CA: 1, C. Richards (Sudbury); 2, B. May; 3, M. J. Falch (Tonbridge); 4, A. I. Feast; CB: 1, B. Wintbridge (Sudbury); 2 and 4, Paul Whiddett (Tonbridge); 3, P. Ramcliffe (Tonbridge); CC: 1, Bill Hastings (SELAS); 2, B. Wintbridge; 3, John Edwards (EKASG); 4, Mrs. Anne Hand (Croydon); DB: 1, C. Richards; 2 and 3, P. Bradley (Brighton); 4, W. A. Knight (Havant); DG: 1 and 3, W. A. Knight (Havant); 2, R. Rowley (Croydon); 4, D. Fober (Bethnal Green); E: 1, J. Bryant (Croydon); 2, Mr. and

Mrs. C. Brook (Croydon); 3, E. J. Jackson (Tonbridge); 4, J. Edwards; EA: 1, Helen Brown (Havant); 2, A. I. Feast; 3, C. Tonna; 4, Paul Handley (Portsmouth); F: 1 and 2, H. Johnson (Beckley); 3, A. I. Feast; 4, D. Cook (Tonbridge); G: 1, C. Richards; 2, H. Johnson; 3, Dave Winder (E. Dulwich); 4, K. Groves (Ashford); H: 1, Paul Handley; 2, H. Johnson; 3, E. J. Jackson; 4, W. A. Knight; J: 1 and 2, P. Levine (Mid-Sussex); 3, B. Wintbridge (Sudbury); 4, P. Edwards (EKASG); K: 1, M. J. Falch (Tonbridge); 2, Veron Hunt (Portsmouth); 3, A. J. Fall (Mid-Sussex); 4, Mr. and Mrs. C. Brook (Croydon); LA: 1, C. Richards; 2, A. I. Feast; 3, J. Edwards (EKASG); 4, Mrs. V. Feast (Tonbridge); LE: 1 and 3, Dave Winder; 2, B. Wintbridge; 4, R. Hogan (East Dulwich); M: 1 and 4, A. I. Feast; 2, H. Johnson; 3, P. Hooper (Portsmouth); MA: 1, A. I. Feast; 2, Bill Hastings (SELAS); 3, P. Cripps (Newbury); 4, Helen Brown (Havant); NBM: 1 and 2, H. Johnson; 3, A. I. Feast; 4, D. Cook (Tonbridge); NOT: 1, John Edwards; 2, D. Chiswright (Southend); 3, Bill Hastings; 4, C. Tonna; O: 1, R.J. Scotting (Ashford); 2, Mrs. B. May (Reading); 3, C. Tonna; 4, D. and P. Lambert (Kingston); P: 1, P. Hastings (Portsmouth); 2, R. J. Scotting (Ashford); 3, A. I. Feast; 4, D. Fober (Bethnal Green and Ind.); Q: 1, A. I. Feast; 2, M. Paine (Folkestone); 3, B. E. Cox (Croydon); 4, Pat Edwards (EKASG); R: 1 and 2, P. Cripps; 3, E. J. Jackson (Tonbridge); 4, Dave Winder; 5, 1 and 2, John Smith (Mid-Sussex); 3, P. Handley; 4, E. J. Jackson; T: 1, D. Chiswright (Southend and Leigh); 2, P. Cripps (Newbury); 3, M. and J. Falch (Tonbridge); 4, R. J. Norris (Croydon); U: 1, 2 and 4, Paul Whiddett (Tonbridge); 3, Kevin Morgan (East Dulwich); W: 1, 2 and 3, Dave Winder; 4, Roy Hart (Hounslow); NBM: 1, 2, 3 and 4, Frank Hart (EKASG); XOT: 1 and 4, D. Chiswright (Southend); 2, P. Roger (Hounslow); 3, H. Wain (Hounslow); ZA: 1, C. Chiswright (Southend); 2, D. Chiswright; 3 and 4, W. P. Woodward (Beckley); ZB: 1 and 3, J. Edwards (EKASG); 2, E. A. Stalwood (Newbury); 4, W. P. Woodward; ZC: 1 and 3, J. Edwards; 2, E. A. Stalwood; 4, W. P. Woodward.

A TALK given by Mr. Bob Spoor at the June meeting of the East Kent Aquatic Study Group was enjoyed by the 60 members present. Bob's talk was about the Berbs of Asia and was illustrated with over 20 living specimens from that area. Members were invited to study the fish, and Bob assisted by his wife Linda, answered questions about their care and breeding. The table show for Coldwater fish was judged by Mr. Colin Pannell and resulted: Single Tails: 1 and 3, C. Bridgeman; 2, R. Matthews; 4, E. March; Twin Tails: 1, P. Saeby; 2 and 3, C. Bridgeman; A.O.V. Coldwater: 1, P. Saeby; 2, S. Pate. Members are looking forward to the Public Exhibition to be held at Lower Hardres, Canterbury, on 5th and 6th September, when they will be able to display their skill at setting up furnished tanks and aquascapes, as well as showing individual fish. Society meetings are held on the second Tuesday of each month at St. Paul Church Hall, Herne Bay, when all aquarists are made very welcome.

ON 31st May the London Section of the B.K.K.S. held their third meeting of the year and it proved enlightening to all. They arranged a visit to the Essex Section on the 21st June and a further visit to Cartered Gardens on 12th July. On Sunday, 7th June Mr. and Mrs. Minton arranged to host a house meeting and quite a few members, were expected to turn up. Mrs. Lily Gray, chair-lady for 1981, has been in hospital suffering a hip complaint but is now on the way to a good recovery and will chair the next meeting on Sunday, 20th September at the Conway Hall, Red Lion Square, Holborn, London W.C.1.

PHILIP SWINDELLS
Will the above named gentleman kindly contact the Editor of this magazine as soon as possible.

SOUTH WEST



A NEW club calling itself the Weston Super Mare A.S. has been formed. Meetings are held once a fortnight, with guest speakers alternate weeks. For further details please ring Weston Super Mare 417958 and ask for Mr. N. Belcher.

NIGEL GRIMSTON, speaking to members of Bristol A.S., emphasised that the serious fish-keeper should concentrate initially on one variety and make sure that any stock purchased was the best available. Table show results: Moors; 1 and 2, Stanley Lloyd, who also took the W. Gadd Trophy; Goldfish: 1, S. Howells; 2, G. Bell; 3, J. Day; 4, S. Lloyd. Cichlids: 1 and 2, Miss A. H. Morgan; 3, 4, 1. Maiden.

EAST



THE Ichiban Rancho Society held a general meeting on 30th May at their headquarters in the 4th Enfield Group Scout Headquarters, Gordon Road, Enfield, Middlesex. Acting Chairman was Frank Hilton. This was the first of the new style meetings, each of which in future will consist of a judge, study and discussion session, and fish will be on show at all meetings. In addition to this show will also be either a lecture or a slide show. All members present agreed that they found the new format most interesting and enjoyable. The next meeting will be held on 15th August at the above address, to which all members and guests are cordially invited. One of the items to be discussed is a proposal by Mr. Alan Lawson in the effect that meetings should be held bi-monthly instead of quarterly.

Plans for the national Rancho Show are under way, and will be held at the above address on 24th October. All enquiries for details and entry forms to: Frank Hilton, 2 Holloway Crescent, Leaden Roding, Nr. Dagenham, Essex. (Tel: White Roding 555).

MIDLANDS AND WALES



THE new committee of the Merthyr A.S. is as follows: Chairman, J. Clifford; treasurer, D. Haggerty; secretary, R. Morgan, 4 Poplar Place, Belshide Street, Merthyr Tydfil; show secretary,

E. Morgan; ass. show secretary, C. Davies; P.R.O., F. Scott. They were elected at the a.g.m. held at the Railway Club, Merthyr on 1st June. The society meets on the 1st and 4th Mondays of each month and new members are welcome at any time.

AT the a.g.m. of Cardiff City Transport Tropical Fish Society, the main committee positions remained the same except for the secretary. The new secretary is Peter L. Hill, 127 Pwllmaen Road, Fairwater, Cardiff CF5 1QB.

NORTH



RESULTS at the annual show of Accrington and District A.S. held on 17th May. Number of entries 450. Best in Show, Dwarf Cichlid owned by Mr. and Mrs. Underwood of Bridgewater Society.

Section A—Guppies: 1, G. Fothergill (Nelson) (section winner); 2, A. and E. Berry (Bridgewater); 3, B. W. Carter (St. Helens); B—Puppies: 1, J. Bellamy (Lytham) (section winner); 2 and 3, A. Roshworth (Piscus); Swordtails: 1, L. Penny (St. Helens); 2, E. and B. Calow (Bridgewater); 3, S. Waterhouse (Merseyside); Mollies: 1, M. and I. Coombes (Nelson); 2, J. Holding (Accrington); 3, G. Fothergill (Nelson); A.O.V. Livebearers: 1, Mr. and Mrs. Baldwin (Sandgrounders); 2, E. and B. Calow (Bridgewater); 3, J. Corbett (Merseyside); C—Characins (up to 7.5 cms): 1, E. and B. Calow (section winner); 2, K. Buckley (Bridgewater); 3, A. Roshworth (Rochdale); D—Cichlids (over 7.5 cms): E. and B. Calow; 2, Mr. and Mrs. Underwood (Bridgewater); 3, Mr. and Mrs. Estough (Sandgrounders); D—Cichlids (up to 10 cms): 1 and 2, Mr. and Mrs. Underwood (section winner); 3, Mr. and Mrs. Riley (Leeds PD); Cichlids (over 10 cms): 1 and 3, Mr. and Mrs. Underwood; 2, Mrs. Jones (Blackpool); Rift Valley Cichlids: 1, R. Maslady (Preston); 2, Mr. and Mrs. Underwood; 3, G. Estough (Angels); 1, Mr. and Mrs. Stevenson (Oldham); 2, Mr. and Mrs. Slater (Blackpool); 3, Mr. and Mrs. Ham (Lytham); H—Barbs (up to 7.5 cms): 1 and 2, Mr. and Mrs. Baldwin (section winner); 3, Mr. and Mrs. Stevenson (Oldham); Barbs (over 7.5 cms): 1, J. Lynch (Merseyside); 2, Mr. and Mrs. Estough; 3, M. Hartley (Sandgrounders); P—Tetraodon: 1, K. Buckley; 2, K. Scollcock (Oldham); 3, F. S. and A. Hopwood (Darwen); A.O.V.: 1 and 2, E. Buckley (section winner); 3, E. Jones (Atherton North West); G—Mollies: 1, Mr. and Mrs. Baldwin (section winner); 2, Mr. and Mrs. Underwood; 3, B. and G. Holroyd (Monticumbey Bay); Sharks and Poses: 1 and 2, Mr. and Mrs. Underwood; 3, B. Rowle (Oldham); H—Danios: 1, Mr. and Mrs. Baldwin; 2, J. Lynch; 3, K. Corbett; Rabbits: 1, J. Corbett (section winner); 2, B. Wilson (Sheffersdale); 3, Mr. and Mrs. Baldwin; J—Fighting: Mr. and Mrs. Riley (Leeds PD) (section winner); 2, Mr. and Mrs. Sumner (Sandgrounders); 3, A. Ratcliffe (Accrington); J—Anabantids (up to 7.5 cms): 1, A. Darty (Piscus); 2, Mr. and Mrs. Underwood; 3, K. Buckley; Anabantids (over 7.5 cms): 1, Mr. and Mrs. Underwood (section winner); 2, Lynch; 3, J. Bellamy (Lytham); K—Pups (Litham): 1, A. and E. Berry (Bridgewater) (section winner); 2, J. Corbett; 3, M. and N. Rimmer (Sandgrounders); Pairs (Rabbit): 1, R. J. Stevens (Darwen); 2, Mr. and Mrs. Baldwin; 3, B. Walsh (Accrington); L—Breeders (Livebearers): 1, K. Buckley; 2, W. Longland (Accrington); 3, K. Siskison (Oldham); Breeders (Rabbit): (A-R): 1, R. Scollcock (section winner); 2, K. Corbett; 3, K. Buckley; (C-D): 1, P. Davis (Oldham); 2, Mr. and Mrs. Stott (Oldham); 3, B. Maslady (Piscus); M—Catfish and Brochis: 1, J. T. Morris (Sandgrounders) (section winner); 2, A. Bobby (Sandgrounders); 3, E. Jones (Atherton North West); A.O.V. Catfish: 1 and 2, J. T. Morris; 3, Mr. and Mrs. Underwood; N—A.O.V. Tropical: 1, Mr. and Mrs. Baldwin (section winner); 2, Mr. and Mrs. Stott; 3, B. Leyland (St. Helens); O—

A.V. Marine: 1 and 2, B. Leyland (section winner); 3, A. Roshworth; P—1, S. Jones (St. Helens) (section winner); 2, G. Rowbotham; 3, L. and M. Buckley; Q—Ladins: 1, Mrs. C. Buckley (Bridgewater) (section winner); 2, Mrs. L. Morris (Sandgrounders); 3, Mrs. Estough (Sandgrounders); Mono-far: 1 and 2, F. S. and A. Hopwood (Darwen) (section winner); 3, Mr. and Mrs. Stevenson (Darwen); Coldwater: 1—Common Goldfish and Comet: 1 and 3, B. and G. Holroyd (Monticumbey Bay); 2, S. Walsh (Accrington); Moors: 1, Mr. and Mrs. Casey (Blackpool); 2, J. Lynch (Merseyside); Veitch: 1, A. Ratcliffe (Accrington); 2, S. Holding (Accrington); 3, Mr. and Mrs. Underwood; 4, E. Berry (Bridgewater); 2, G. Fothergill (Nelson); 3, S. Walsh (Accrington); Koi: 1, C. Wallbank (Accrington); Pastals: 1, C. Wallbank (section winner); 2 and 3, Mr. and Mrs. Underwood; Oranger: 1, T. Barlow (Accrington); 2, A. Pennington (Independent); Liveheads: 1, S. Walsh (Accrington); A.O.V. Coldwater: 1, A. and E. Berry; 2, J. Lynch; 3, M. Hartley (Sandgrounders); Breeders (Coldwater): Mr. and Mrs. Hinde (Independent).

AT the April meeting of the Northern Area Group of the Catfish Association of G.B. with 25 members present, a varied programme was held, ranging from using aquatic lice to keep fungus off Catfish eggs, to a method of hatching brine shrimp on a fairly large scale. The main entertainment consisted of the showing of the show-off of the 1980 London Catfish show, by Mr. Cliff and Mr. David Spence of Bristol, and David Sand's lecture "The World of Catfish".

A change of committee—Mr. Alan Waterhouse has had to resign due to family illness. His duties as treasurer have been taken over by Mr. George Waterhouse, the Vice-Chairman. For information about the group and a.c. to the Northern Regional Representative, Mr. J. T. Morris, 102 Cair Lane, New Springs, Wigan, Lancs.

Stockton A.S. open show results: Best Fish in Show: S. Smith (Ind.); Class 6: Da Anglin; 1 and 2, A. Soiling (STAS); 3, D. Morgan (NAIDAS); 4, D. Gray (Billingham); DS: 1, S. M. Burgess (WDAS); 2, Mr. and Mrs. Rowley (Ind.); 3, J. Ashwaite (STAS); 4, G. McLaren (WDAS); D: 1, C. A. Frame (RAS); 2, H. Warble (RAS); 3, Mr. and Mrs. Goodland (NAC); 4, D. Clark (Hartlepool); D: 1, K. Dodd (BAAS); 2, J. Kelly (Sh. Shields); 3, H. Wardle; 4, T. Wilson (WDAS); B. Labyrinth: 1, Hornaby (Bishop Auckland); 2, D. Dixon (Stanley); 3 and 4, T. Wilson; Es Betta Splendens: 1, T. Sayers (Stanley); 2 and 4, D. Gray; 3, G. Taylor (WAS); F. Raftering toothcars: 1, Mr. and Mrs. Rowley; 2, J. Gedhart (Billingham); 3, J. Ashwaite; G. Tropical Catfish: 1 and 2, S. Smith (Ind.); 3, P. Wright (Garr-Urfa); 4, A. Soiling; H. Corydoras and Brochis: 1, M. Daley (STAS); 2 and 3, P. Mason (Billingham); 4, I. Johnson (STAS); Not Breeders Class (Live): 1, J. Gedhart; 2, T. Sayers; 3, J. Ashwaite; 4, P. Wright; Xbn Breeders (Egg): 1, P. Fry (Sh. Shields); 2, Mr. and Mrs. Conlin (STAS); 3, P. Wright; 4, F. Bell (Stanley); W.A.O.S. Coldwater: 1, 3 and 4, A. Adley (RAS); 2, P. Wright; V. Two-tailed Goldfish: 1, C. A. Frame (RAS); 2, R. Filloc (RAS); 4, K. Dodd (Bishop Auckland); U. Single tailed Goldfish: 1 and 4, C. A. Frame; 2, T. Harland (BAAS); 3, R. Elliot; T.A.O.S. Livebearer: 1 and 3, J. Ashwaite; 2, N. Foster (BAAS); 4, S. M. Burgess (WDAS); S. Molly: 1, D. Morgan; 2 and 4, P. Wright; 3, S. Smith (Ind.); R. Fry: 1, J. Kelly; 2, D. Russell (Stanley); 3, S. M. Burgess; 4, F. Bell; Q. Swords: 1, B. Hindson (Stanley); 2, D. Russell; 3, H. Radestock (Sh. Shields); 4, D. Wainman (Hartlepool); R. Rasbora: 1, D. Dawson (AAA); 2, D. Wainman; 3, C. A. Frame (RAS); 4, J. D. Duffell (Ind.); K. Danio and W.C.M.M.: 1, C. A. Frame; 2, S. Tipper (Ind.); 3, W. Foster (BAAS); 4, L. Gray (STAS); L. Loach: 1, K. Cooby (Middlebrough); 2, C. A. Frame; 3, B. Kennedy (Stanley); 4, Mr. and Mrs. Goodland (NAC); Ita Laboto: 1 and 2, J. Ashwaite; 3, S. Riley (APAS); 4, T. Wilson (WDAS); Mr. A.O.S. Tropical Egg-eater: 1, S. Wharton (Hartlepool); 2, J. Wharton (Hartlepool); 3, E. Ireland (Stockton); 4, A. Adley (RAS); Nhm: 1, H. Radestock (Sh. Shields); 2, B. Kennedy (Stanley); 3, S. M. Burgess (WAS); 4, G. Middlemas (RAS); Not Breeding Pairs (Live): 1, Hornaby (Bishop Auckland); 2, J. Ashwaite; 3, S. M. Burgess; 4, Richardson (Bishop Auckland); O. Guppy (Male): 1, R. and S. Kirkcup (CUAS); 2 and 3, D. Dawson (AAA); 4, Goodland (NAC); P. Guppy (Female): 1, B. Hindson (Stanley); 2, J. Kelly; 3, P. Fry (Sh. Shields); 4, B. Kennedy; Bc Barbs: 1, T. Sayers; 2, K. Thompson (Bish); 3, F. Bell; 4, D. Dixon; Bc Barbs: 1 and 2, L. Collins (STAS); 3, J. Ashwaite; 4, R. Williams (STAS); Cc-Cc Characins: 1, D. Wilson (Ind.); 2, J. S. Race (NADAS); 3, J. P. Duffell; 4, J. Gedhart (Billingham).

Dates for the diary

A monthly information column to keep you up to date on forthcoming events.

AUGUST

- 2nd August:** Abbey Fishkeepers Society first open show. Show Secretary: E. J. Lack, 23 Botolph Road, Abbey, Scunthorpe, South Humberside DN16 3BX (Tel: 52780).
- 2nd August:** Leicester A.S. first open show at the St. Matthew's Community Centre, Malabar Road, Leicester. Details and schedules from Show Secretary D. Sewell, 32 Parkdale Road, Thurmaston, Leicester. (Tel: 695305).
- 8th August:** Oldham & District A.S. open show at Werneth Park, Oldham. Information and schedules from A. Chadwick, 9 Brownville Close, Chadderton, Oldham (Tel: 681-652 6207).
- 9th August:** Gainsby & Cleethorpes A.S. Open Show at the Memorial Hall, Cleethorpe. Benching 12-2 p.m.
- 15th August:** Northern Goldfish and Pondkeepers Society 5th open show at the Sports Centre, Silverwell Street, Bolton. Details and entry forms from D. Lord, 40 Hospital Road, Bromley Cross, Bolton.
- 15th-16th August:** Yorkshire Aquarists. Festival at Doncaster Racecourse. Details from R. Singleton, 13 Schofield Drive, Darfield Barnsley, Yorks.
- 18th August:** Midlands Koi Association and the United Kingdom Chapter of the Japanese Koi Society joint national open Koi show at Twycross Zoo, Leicestershire. Details from U.K. Chapter, Zen-Nippon Aikikai, P.O. Box 30, Windsor Street, Uxbridge, Middx.
- 22nd August:** Trehomas & District A.S. show at the St. John Ambulance Hall, Pandy Road, Bedwas, near Caerphilly. Benching 9-12.30 p.m. Trophies and prizes for all classes. For further information please contact A. Phillips, 28 Lansdown Drive, Trehomas, Gwent, or phone 0222-884393.
- 22nd August:** (Change of Date) Castleford A.S. open show at Woodhouse Hill W.M.C., Wakefield Rd, Normanton, schedule from C.A.S. secretary, B. Stansil, 4 Milnes Grove, Alredate, Castleford WF10 3EL. (Tel: 01937-84751).
- 22nd August:** Weymouth A.S. tropical and coldwater fish exhibition (11 a.m. until 3 p.m.) at the small Sidney Hall, Weymouth. Details from Club Secretary, Mr. S. G. Harding, 6 Rowleigh Road, Weymouth, Dorset DT4 7JD.
- 23rd August:** Nuneaton A.S. open show at Community Centre, New Town Road, Nuneaton. Information from Show Secretary, G. Hemmings, 142 Tomkinson Road, Nuneaton, Warwickshire (Tel: 0692 325271).
- 28th August:** Open show of fancy goldfish in Dumfrieshire. Organized by the Scottish Goldfish Group. Details and schedules from Tommy McLean, 36 Coonton Park, Craighill, Livingston, West Lothian, Scotland.
- 28th & 29th August:** The Dred and District A.S. annual show in the O.A.P.'s Hall, Duke Street, Deal. This is a 'closed' show, but is open to the public after judging has been completed.
- 30th August:** Long Eaton A.S. sixth open show at the Gregory's Rose Gardens, Toton, Nottingham. Enquiries to K. West, Show Secretary. (Tel: Long Eaton 63023).
- 30th August:** Fleetwood & District A.S. open show at the Marine Hall, in the Marine Gardens, Promenade, Fleetwood. For further information or schedules when printed write or telephone, B. Frost, 103 Chatsworth Avenue, Fleetwood, Lancs. (Tel: F/Wood 70477) or Mrs. Avril Stanhope, 6 Rhyt Street, Fleetwood, or David Sands (president), 116 Henketh Lane, Tarleton, Nr. Preston.
- 30th August:** Ashford & District A.S. first open show, at Seelidge Village Hall, Seelidge, Kent. Schedules from R. Scoring, 6 Manor Way, Ashford, Kent (Tel: 23380). Champion Class 'P', Troza best fish, highest pointed society, junior championship, gold pin, trophies for all classes.
- 30th & 31st August:** 'Fishhibition 81' Gr. Yarmouth & District A.S. will be staging their annual exhibition at the St. George's Arts Centre, King Street, Gr. Yarmouth. Tropical and coldwater fish displayed, tables, stalls, trade stands, etc.
- 31st August:** August Bank Holiday Monday, Y.K.S. Annual Koi Festival and Open Show, at Harwood House, near Leeds.

SEPTEMBER

- 5th & 6th September:** East Kent A.S.G. Public Exhibition of Fishkeeping, Lower Handry Village Hall, Nr. Canterbury, Kent. Further details from Bob Spooce (Tel: Canterbury 52382).
- 6th September:** Salisbury & D.A.S. annual open show to F.R.A.S. rules, at the Activity Centre, Wilton Road, Salisbury. Schedules from show Sec., D. Edlestein, 33 Somerset Road, Salisbury, Wilts. (Tel: 0722-26219) S.A.E. please.
- 6th September:** Banbury & District A.S. 1st Open Show at The Spicball Arts and Community Association. Details from R. H. Hanson, 57 Lennox Gardens, Banbury, Oxon. Tel: Banbury 59525. (S.A.E. please).
- 6th September:** Bridgewater A.S. open show at St. George's Community Centre, Kenyon Way, Little Hulton, Worsley, Manchester. They will also hold an auction of Fish and Equipment. For any further information please ring Farnworth 791312 (Kevin Buckley) or write to 1 Soddon Lane, Scaugh, Radcliffe, Manchester M26 9HN.
- 6th September:** Huddersfield Tropical Fish Society open show at Blithwaite Civic Hall, Blithwaite. Details from Mrs. P. Town, 187 Abbey Road, Shipley, Nr. Huddersfield. (Tel: Kirkburton 7640).
- 6th September:** Wellingborough & District A.S. open show at Westfield School for Boys, Brickhill Road, Wellingborough, Northants. For schedules write to M. Cox, 20 Salisbury Street, Kettering, Northants (Tel: 521600).
- 16th September:** Weymouth A.S. host to this year's Triple Show which is to be held at the small Sidney Hall, Weymouth, commencing 7 p.m. The other two clubs competing are Dorchester and Yeovil. More details from Club Secretary, Mr. S. G. Harding, 6 Rowleigh Road, Weymouth, Dorset DT4 7JD.
- 12th September:** Houslow & District A.S. open show at the Houslow Youth Centre, Cecil Road, Houslow. Information from Show Secretary, T. Hollingsbrooke, 2 Holmwood Close, Addlestone, Surrey (Tel: Weybridge 54976).
- 12th September:** Bristol A.S. coldwater fish show at St. Andrew's Church Hall, Strivedon Road, Whitehall, Bristol, 3-5.30 p.m. Details from I. Midden, 87 St. John's Lane, Bristol BS3 5AB (Tel: 0272 712383).

- 12th September:** British Koi Keepers Society national open show (Koi 81) or Birmingham Gardens, Dist. Norfolk. Membership Sec., Mrs. C. Mallins, "Woodlands," South Avenue, Langdon Hills, Basildon, Essex.
- 12th September:** Buxton & District A.S. open show at the Paston Suite, Pavilion Gardens, Buxton.
- 12th September:** Barnsley Tropical Fish Society 17th open show at the Hall Bank School, Huddersfield Road, Barnsley. Further information contact G. Wall, Barnsley 47220.
- 12th September:** Cheltenham Tropical Fish Club open show at St. Marks Community Centre, Hesters Way, Cheltenham, Glos. Schedules (June onwards) from M. Jenkins, 3 Marlborough Place, Princes Street, Cheltenham, Glos. S.A.E. please.
- 12th September:** Potteries and District A.S. 2nd annual open show. Venue: Stoke-on-Trent Technical College, Moorland Road, Burslem, Stoke-on-Trent, Staffs. Further details available from Malvyn Clarke, show secretary, 41 Chell Heath Road, Bradeley, Stoke-on-Trent, Staffs.
- 17th September:** Kingston and District A.S. Bring and Buy at Raynes Park Methodist Church Hall, Worpole Road, Raynes Park, S.W.20. Further details from Pat Lambert (Tel: 01-542 9966).
- 20th September:** Berwick & District A.S. open show at the Tweedmouth Middle School. Judging 1.45 p.m., benching from 11.30 a.m. to 1.30 p.m. Further information from Mr. S. Murray, 78 Dean Drive, Berwick-on-Tweed, TD15 2DE or by phoning Berwick 5391 after 5.30 p.m.
- 20th September:** North Wilts A.S. open show. Details from Show Secretary F. Taylor, 7 Ridgeway Road, Stratton, Swindon. (Tel: 824114).
- 20th September:** Tonbridge & District A.S. open show at Hadow Community Centre, Hadow. Schedules from A. Feast, 5 Pollards Wood Road, Nr. Otter, Surrey RH8 0JN.
- 20th September:** Diss open show at the Youth Centre, Shellinger Road, Diss, Norfolk. Schedules from Neil Home, 10 Blomfield Road, Diss, Norfolk IP22 3NU. (Tel: Diss 0379 4541).
- 20th September:** Chesterfield A.S. open show at Westfield upper school, Walsby. Benching 12-1.45 p.m., Judging 2 p.m. Schedules from L. Wadley, 79 West Street, Eckington, Nr. Sheffield S31 9GA. (Tel: Eckington 432531).
- 27th September:** First open show of the Northern Area Group of the Catfish Association of G.B. For details write to Mr. J. T. Morris, 102 Gale Lane, New Springs, Wigan, Lancs., or Mr. B. Baldwin, 10 Olive Grove, Southport.
- 27th September:** Throckley A.S. are to hold a grand auction and limited class show in the Grange Welfare Association, Throckley. All proceeds to go to the Grange Welfare Ambulance Appeal Fund in "The Year of the Disabled." Benching 11.30 a.m. to 1.30 p.m. Auction in main hall at 1.45 pm. Please bring as many fish and as much equipment as possible for auction in support of this appeal. Schedules available later (s.a.e. please) from Mrs. D. Lakey, 51 Hewley Crescent, Throckley, Newcastle-on-Tyne (Tel: 0632-67236).
- 27th September:** Wolverhampton A.S. open show at the Odeon Community Centre, March Lane, Wolverhampton. Details from Show Secretary, Pete Wainall, 16 Essington Way, Wolverhampton (Tel: Wolverhampton 53979).
- 27th September:** Harlow A.S. open show at Moor Hall, The Stew, Harlow, Essex. Show Secretary, Peter Murdoch, 11 Woodfield Terrace, Thoreswood Common, Epping, Essex, (Tel: Epping 72314).
- 27th September:** Wyke show Society, Hull, open show.

OCTOBER

- 3rd October:** Goldfish Society of Great Britain open show and convention. Particulars from H. Berger, 74 Baron Gardens, Barking, Essex.
- 3rd October:** The British Koi-Keepers Society—11th Anniversary celebration at the Leicester Centre Hotel from 12.30 p.m. onwards. Lectures will be given by Dr. David Ford (Feeding, etc.), Mr. Austin Cartwright (Diseases), and Mr. Robert Keat (Fish on Koi). Dinner-dance in the evening. Contact R. Talbot (Tel: Garboldisham 368.). Membership Sec. Mrs. C. Mallins, "Woodlands," South Avenue, Langdon Hills, Basildon, Essex.
- 4th October:** Newbury and District A.S. open show at the Coxs Exchange, Market Place, Newbury, Berks. For more information contact the Show Manager, Robbie Canning, 6 Southend, Cold Ash, Newbury, Berks. (Tel: Thatcham 64254).
- 4th October:** A & D Fishkeepers first open show at the Sutton in Ashfield Social Service Centre, Hillsdale School, Sutton.
- 11th October:** British Cichlid Association convention at the Meeting Rooms, Zoological Society of London, Regent Park, 2.0 p.m.
- 11th October:** Darwin A.S. open show in the Library Theatre Darwin. Details from Secretary Derek Gow, 95 Greenway Street, Darwin.
- 11th October:** South Leeds A.S. open show at Hazlet Boys Club, Hillside Road, Leeds 10. Benching 12-2 p.m. Schedules from R. Day, 3 British Mount Woodhouse, Leeds LS6 2JZ.
- 17th October:** East London Aquarists and Pondkeepers Association annual open breeders show at the Central Hall, Cecil Road, Chadwell Heath, Romford, Essex. Schedules from Mr. Keith Palmer, 16 Fulwell Avenue, Barking, Essex.
- 18th October:** Doncaster & District A.S. open show at Don Valley High School, Jersey Lane, Scunthorpe, Nr. Doncaster.
- 18th October:** Wyre Forest A.S. open show. Show secretary Charles N. Baskerville.
- 18th October:** Bethnal Green & Independent A.S. first open show at Windsor Road School, Windsor Terrace, East Ham, London, E.6. Further details and schedules from Mr. J. A. Brown, 46 Arthurs Road, Goodmayes, Essex, Essex IG5 9QU (Tel: 01-599 8222).

NOVEMBER

- 1st November:** Halifax A.S. open show. Benching 12-2 p.m. Schedules (s.a.e. please) from David Shields, Cobblestones, Gainsay, King Cross, Halifax.
- 7th 8th 9th November:** British Aquarists Festival at Belle Vue, Manchester. Details and schedules from John Hall, 54a Carr Road, Caverley, Pudsey LS28 3EU.
- 8th November:** Bradford and District A.S. open show at Textile Hall, Westgate, Bradford. Details and schedules can be obtained from the show secretary, Mr. A. D. Fisher, 2 Sherborne Road, Idle, Bradford (Tel: Bradford 614160).
- 22nd November:** Goldfish Society of Great Britain general meeting, 2 p.m., Gunsey Hall, Red Lion Square, Holborn, London.