

TROPICAL FISH

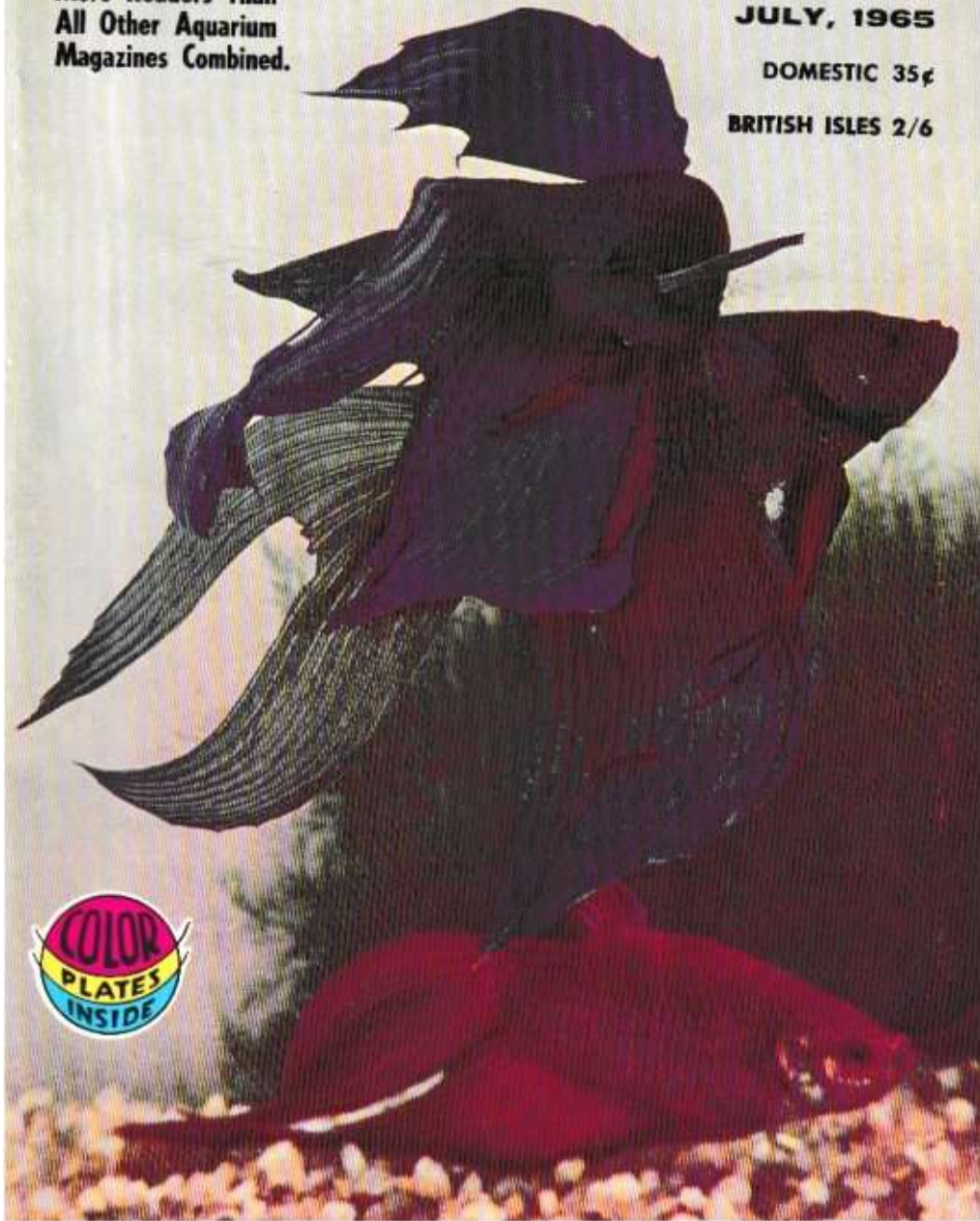
HOBBYIST

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JULY, 1965

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GARDEN POOLS, by Paul Stetson. \$1.00 from your dealer or direct from TFH.

In his excellent book *Garden Pools*, author Paul Stetson leads the reader through the intricacies of setting up both formal and informal garden pools, describes the most popular and beautiful of the many colorful water lilies that can be grown in garden pools, and lists some of the other animals and plants that can be given homes in water gardens. Apart from the information given on general good water gardening practice, author Stetson gives many helpful suggestions and answers some of the most practical questions that would be of interest to anyone contemplating livening up the landscape of his home with a garden pond. For example, the book has a complete section devoted to ordering fishes and plants.

Besides being a valuable guide to water gardening as it is concerned with water lilies and other plants commonly associated with garden pools, this book is also valuable for its treatment of Goldfish and the new hybrid Carp developed by Japanese breeders, Koi. There are sections on feeding and breeding Goldfish.

Other topics covered in the book include: the construction and care of garden pools, planting and care of water lilies, and summer care and maintenance of the pool.

TROPICAL FISH HOBBYIST

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Contents	
Vol. XIII, July, 1965 (P. 113) No. 11	
Meet the Hobbyist—	
Warren and Libby Young	5
A Fish Show in Australia	20
<i>Caraulus variegatus</i> (Günther) X <i>Caraulus</i> <i>carolinensis</i> (Günther) (Koi), Japanese Colored Koi	33
The <i>Mikado</i> Series, Alibates, and Breeding of a Fish Show in India	36
Breeding the Red-Chinned Parrotfish (<i>Sciaenops ocellatus</i>)	47
Breeding the Salted Sea, <i>Mastomys</i> <i>pentadactylus</i>	75
FEATURES	
Notes from All Over, p. 30; Mail Call, p. 33; Guppy Corner, p. 44; Bits from the Street, p. 47.	
COVER	
The cover photo of the June issue of 1964 was not credited correctly. The photo was by Dr. Jacques Huet. The Japanese breeder on our cover this month are the new bloodlines developed by Warren and Libby Young. We've never seen bettas with such successful breeding and color results. A few notes were put together to get this photo and which is a matter of a second or two, the fish were fighting. Airtight covers were put on the water glass just after the fish had torn a sizeable piece out of another's eye. Both the fish are still and healthy. In the first betta's mouth is a piece of the other's eye. A number of other water photos and the detailed story of how the Youngs breed their bettas, turn to the story beginning on page 3. Photo by Dr. Herbert R. Axelrod.	
EXOTIC TROPICAL FISHES SUPPLEMENTS	
Pages 53 and 54, 51 and 52. These pages are mentioned for any unopened and inserted in 28 into the December Edition of EXOTIC TROPICAL FISHES.	

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July, 1965

EDITORIALLY . . .

I've talked frequently with aquarium society members about the unfairness of fish competitions, whether they are the ordinary monthly "bowl shows" or annual "fish shows." "How are you going to stop a fellow who has a well-loaded pocketbook from walking away with all the awards?" I am asked. It's a rough question to answer. Take on the one hand a fellow who has raised a batch of fairly good fish and now has a few which he feels would stand a good chance in competition. He enters his best pair. Another fellow goes to a professional breeder who has a great many fish on hand and has him pick out a pair for him on the day of the competition. He pays a fancy price for his beauties, which perhaps in a week's time under his poor care will turn up their expensive fins and die. But they do their job that day, winning the ribbon for their owner, nosing out the fellow who raised his fish from babyhood and always gave them the best of attention. How are we going to put a short leash on a fellow like that? He holds all the trump cards. He can afford to pay a stiff price for a pair of fish which the other fellow would have to go without lunches to buy. After a time other members don't want to enter their fish any more, because what is supposed to be a competition is not much more than a formality. How are you going to put a stop to this sort of thing? An aquarium society can make a rule that no fish may be shown which has been bought within a month's time before the show. But does this stop our friend? No, indeed! If he wants to live up to the letter of the rules, he has one of his friends buy the fish for him and then give them to him just before the show. The only thing we can do with a fellow like this is to appeal to his good sense (if he has any at all) and tell him that what he is doing is not only unfair but a disservice to the hobby as well.

William Vorderwinkler

3



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Male Libby Bettas are as wild and ferocious as Siamese stock. This pair of males are tearing each other apart. Note the piece of tail missing from one of the Bettas is being eaten by the other. Photo by Dr. Herbert R. Axelrod.

The Youngs Breed Better Bettas.

Meet the Hobbyist— Warren and Libby Young

BY DANNY DI COCCO

In 1961, when the American Guppy Association held its championship match, Warren and Libby Young won the Eastern Championship Trophy. At that time they had been raising Guppies for about ten years . . . and their basement-full of aquaria was there to prove it.

5

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Just a few of the trophies won by the Youngs over the past few years. In 1964 the Youngs took three Best-in-Shows with their Libby Bettas. Photo by Hans Peter.

About a year and a half ago, Libby became interested in Bettas. It didn't take Libby long to infect Warren with the same Betta-bug, and soon these famous Guppy breeders developed one of the most fancy strains of Bettas ever to hit the market. These are the "Libby Bettas" and are characterized by huge, round tails which are at least three times as high as the width of the body. Their anal and dorsal fins are also three times body width and when the fish is a year old or more (the males only, of-course), the intensity of their colors is something to behold.

When I took the fish to Dr. Herbert R. Axelrod so he could photograph them in his laboratory, even he was amazed at their size and color and he immediately made me promise to get him ample breeding stock for Gulf Fish Farms in Palmetto, Florida, where Dr. Axelrod will maintain this strain and make them available to other fish farmers and breeders, as well as for sale to discriminating petshops all over the country. While he was photographing

July, 1965



A Blue-green Libby Betta male. Photo by Dr. Herbert R. Axelrod.

the different color varieties that the Youngs had developed, he asked me if he could put a few of the males together so he could see if they still had their fighting spirit. Hesitatingly I said "Yes," but I certainly was worried that they might tear themselves up.

Almost immediately after I selected four males to put into the aquarium, one pair of males began attacking each other. Almost before Dr. Axelrod could load his Exakta camera, one of the fish tore a piece of tail off its antagonist and proceeded to almost leisurely chew it up.

How the Youngs maintain their Libby Bettas

I have been breeding Bettas for many years, and I have often won prizes in competition for my beautiful males. But the Libby Betta is the most beautiful fish I have ever seen, and I was rather apprehensive when I cautiously asked the Youngs if I could see their setup.



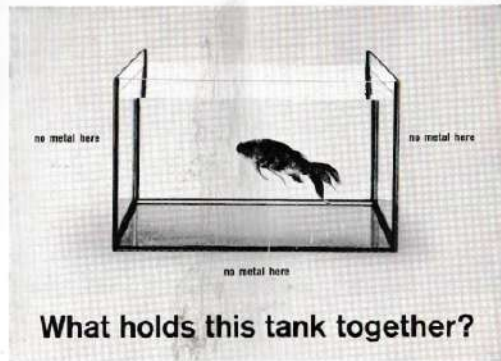
Fighting Libby Bettas line up at the surface of the water and go for each others gills first. Usually they merely tear fins apart and neither Betta is killed. The victor merely dominates the top surfaces of the aquarium while the loser shirks timidly at the bottom. Photo by Dr. Herbert R. Axelrod.

The characteristics of the Libby Betta are the round tails which are three times as wide as the width of the body . . . and the bodies are very heavy and full. The anal and dorsal fins are equally as wide and full. Photo by Dr. Herbert R. Axelrod.



I needn't have been worried, for the Youngs have no secrets. "C'mon over. Anytime. We'd be delighted to have you." These were the remarks I heard, from the Youngs, who are as warm and friendly as they are successful. Off I went at the first opportunity to First Avenue in Little Falls, New Jersey and visited with the Youngs. Not only did they tell me everything they did, but they gave me choice breeding stock so I could raise some Libby Bettas myself. My son John, a champion football player, is now specializing in breeding Bettas with his brother Dino.

The author, left, with Libby and Warren Young. The Youngs kept no secrets from the author and gave him ample breeding stock as a gift. The Youngs also supplied Dr. Axelrod with breeding stock at Gulf Fish Hatchery in Palmetto, Florida so the Libby Betta could be made available on a national basis. Photo by Hans Peter.



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A Chocolate-red Libby Betta male, the most rare of all colors. Photo by Dr. Herbert R. Axelrod.

During the course of my conversations with the Youngs, they constantly stressed the following points as their keys to success.

1. SUCCESS IN BREEDING THIS TYPE OF BETTA IS CLEANLINESS. Especially when the fish are young. Change the water in their tanks and jars twice a week, whether it looks dirty or not.
2. DON'T USE UNSEASONED WATER. Store water in wooden barrels or some other suitable container for at least three days before you put Libby Bettas into it.
3. USE WATER AS CLOSE TO NEUTRAL (PH 7.0) AS POSSIBLE. The Young's tap water is 7.8 and has to be brought down to neutral.
4. USE WATER AS SOFT AS POSSIBLE. The Youngs use a commercial zeolite water softener to bring their 8° hardness water down to 2° or 3°.

How the Youngs breed Libby Bettas

Breeding the Libby Betta isn't much different than breeding any Betta, but the following is how the Youngs do it. They use almost any tank that is empty, from a 2-gallon to a 10-gallon. The water level is never more than 4 inches from the bottom, so the male can have an easier job in caring for the hatching and free-swimming fry.

The Youngs put the male breeder into a very clean aquarium. This male is selected for color, finnage and activity. The more of these characteristics he has, the better. Then the female is put into a jar, and the jar with the female is introduced into the same aquarium. Of course the jar is much higher than



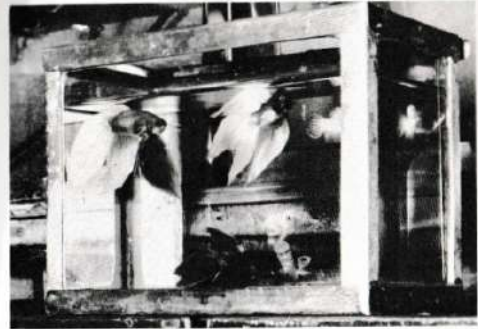
A Blue-red Libby Betta male. Photo by Dr. Herbert R. Axelrod.

A Red Libby Betta male. Photo by Dr. Herbert R. Axelrod.





July, 1965



The Youngs are also developing a Split-tail Beta as you can see from the comparison of the tails of the normal Libby Beta and the Split-tail Libby. The full tail is much more beautiful, though. Photo by Hans Peter.

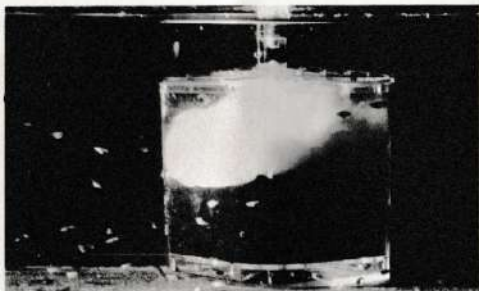
4 inches, and this keeps the female separated from the male, but at the same temperature. The male sees the female through the glass walls of the jar and begins to build his bubble nest.

Usually the Youngs use the open half of a styrofoam cup as a holdfast for the nest. Sometimes they use plants. The styrofoam float is the more successful . . . and the male will build his nest right in the styrofoam ring to protect it from breaking up.

As soon as the male has completed his nest, the female is released from her jar so she can join the male. Assuming she is ready for spawning, is full of eggs and has the typical white nipple projecting from her anal pore as indication of her readiness to spawn, spawning should take place within 24 hours. Usually it happens in a few hours. To insure greater spawning activity, the Youngs cover the breeding tank with Saran wrap immediately after they put the breeding pair together. This causes about a 6° rise in water temperature. At the resulting 80° temperature, the Bettas are more inclined to spawn and the spawn hatches more quickly.

Once the male has spawned, the female is removed and the male is left to

Tropical Fish Hobbyist



When the fish are about a month old, they are transferred to a long 20-gallon aquarium with water only four inches deep. Gradually, as the fish mature, the water level is increased about 1 inch per week, until the males, at 8 weeks of age, are separated and put into their own individual jars. Photo by Hans Peter.

stone is utilized to prevent a scum from forming over the water surface. This is necessary or the fry won't be able to break the surface tension to get their necessary gulps of air.

For the first day or so, the fry are fed infusoria or one of the commercially prepared liquid fry foods. From the second or third day on, the young are fed newly hatched brine shrimp until they are old enough to eat chopped tubifex worms which have been thoroughly washed.

The fry remain in the breeding tank until they are 3 or 4 weeks old, depending upon the size of the fry and the size of the spawn . . . as well as the size of the spawning tank! After a month, maximum, they are transferred to a low 20-gallon aquarium, and as the fish get older, the water level in this aquarium is raised from an initial 4 inches, to almost the top of the tank.

When the fish are about two months old, the males are sorted out and placed into individual jars so they can be raised without damaging each others fins.

If you want the most beautiful Bettas the world has ever seen, go to your petshop and ask him to order some Libby Bettas for you. They might cost you \$5 or \$6 each, but they are well worth it . . . and don't forget to order some females, too, if you want to breed them. The experience and pleasure of raising the finest Bettas in the world, is satisfaction enough for the Youngs. Their Libby Beta is as valuable a contribution to aquarium history as I have ever seen.

July, 1965

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First prize went to this set-up. This is natural looking landscaping at its best. The fish (not visible) were about 30 red wugtail platies.

A Fish Show in Australia

BY MANFORD RHODES

The recent fish display and competition of the Townsville Aquarium Society at the Melbourne Royal Agriculture Show was a great success. Fifty six thousand visitors saw it, and from the comments I heard, they were pretty impressed. The tanks were the most impressive I have ever seen. Some of the set-ups were there only for display, but a great many of them were entries in the Society's open competition.

I'll show you around briefly (with words) as best I can. As we enter the building, the first aisle is the dealer display section. This consists of a number of 3-foot tanks, nine containing tropicals, the rest stocked with goldfish. These tanks are really beautifully set up and stocked, a fine introduction to the show.

Following the dealers' displays are a series of novelty tanks containing axolotls, newts, frogs, and baby tortoises. But wait! Take a look at the main aisle. We're interested in fishes aren't we? Let's leave the novelty displays and get over there.

On the main aisle left are a series of tropical fish exhibits. These are all entries in the Society competition. A few of the fishes on display here are tiger barbs, kribensis, rasboras, and guppies. Over there, at the end of the row are bubble eye and perma-black fantail goldfish. Notice particularly how beautifully all the tanks are landscaped.

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Tropical Fish Hobbyist



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This one didn't take a prize, but take a look at the beautiful job of planting.



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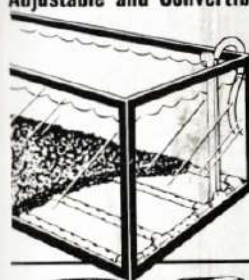
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26



No prize for this tank, but it's a beauty. Note how the interesting piece of driftwood has been used as a focal point.

Each one really looks like a section cut out of a river or lake. Hold up a minute, I've got to have pictures of some of these tanks; I'm sure glad I brought my camera.

On the main aisle right is a terrific display, native fishes. These tanks have been provided by the Department of Fisheries and Wildlife. Five 3-foot tanks are stocked with trout cod, golden perch, macquarie perch, blackfish, pigmy perch, smelt, and minnows. But the most fantastic thing here is an 8-foot tank containing three very large murray cod. I wonder how many new Australian angling enthusiasts this will create.

Well, that's about all I have time for now, but I'll tell you what: After the prizes have been awarded, I'll get some pictures of the winning tanks for you.

Aquarium Fish Diseases by Dr. Rolf Geisler. A new, up-to-date booklet published to answer the modern aquarist's demand for more science and less guesswork in the keeping of tropical fishes. *Aquarium Fish Diseases* covers poisoning by dissolved substances, nutritional malfunctions, external parasites, internal parasites, and many other ailments. It provides information on the life histories of the causative organisms, how they are transmitted, and their prevention and control. A profitable investment and a valuable addition to the aquarist's library.

From your dealer or direct from T.F.H., \$1.00.

27

Tropical Fish Hobbyist

Notes from all over

NEW STATE OPERATED AQUARIUM URGED IN NEW JERSEY

A recently introduced resolution urges the State Department of Conservation and Economic Development to build and operate a state aquarium at Sandy Hook State Park in New Jersey. According to Assemblyman Patrick J. McGann the aquarium could keep both freshwater and saltwater fishes. It could also have related exhibits for scientific and educational purposes. It has been suggested that the aquarium be created in conjunction with the existing U.S. Marine Biological Station of the Department of the Interior.



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30

July, 1965



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*To figure pool size, length x width x depth (in feet) x 7 = gallons.



The Garden Pool Miracle Filter is easy to install. No special tools are required. Install a good heavy duty submersible pump and connect to fountain or waterfall - then stand back and see the fish.

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31

The Misadventures, Mistakes, and Madness of a Fish Lover in India

BY DONALD A. SIMPSON

After due consideration I am completely convinced that a full membership in the Fish Fraternity requires a certain amount of madness in the applicant. If there should be some small doubt in the minds of any of you as to the veracity of this statement, read on.

On March 3, 1943, the good ship *USS Monticello*, a U.S. Navy transport, pulled into the harbor of Bombay, India, and anchored, waiting its turn to tie up at the pier. It stayed there too, for the next 24 hours, just a half mile from land, and it was a mighty frustrating experience for those aboard, after being at sea for nearly 2 months on the trip out from California. I was one of the frustrated ones, but was not exactly alone, for besides the navy crew of 1,100, we had 6,000 army troops aboard. We were all itching to get our feet on land. It had been a rough trip and although the *Monticello* was a large ship (the former *Comte de Grande*), with 7,100 aboard, there was hardly room enough to spit without putting it in someone's eye.

I, a GI, had been assigned to this floating Cook's tour as Troop Sergeant Major, together with a light colonel who was Troop Commander. The colonel was sort of a glorified hotel manager, while I guess I could be compared to the room clerk on this jam-packed sea going Ark. And we had been a right-busy pair for the 6 weeks of the voyage, catering to the wants of our 6,000 army guests. The *USS Monticello* wasn't exactly comparable to a luxury liner in comfort or cuisine but the colonel and I had our compensations: after we dumped our cargo of human freight, they had to shove off and do a little fighting, while we—lucky guys—sailed home on our floating hotel for another load.

But all of that has little to do with this tale of woe, except to explain how I happened to be in Bombay harbor wishing they'd get the old rust bucket into the pier and tied up so I could get ashore. There were a number of things I wanted to do ashore. At the top of my agenda, after the washing of a little of the ocean dust out of my throat, was to do a little scouting someplace along the shore, to see what India had to offer in the line of native fishes.

The next day we pulled up anchor early in the morning and tied up at the Ballard Pier, but it was 2 days more before I was free to go ashore. For 2 solid days those 6,000 GI's pounded down two gangways and boarded trains at the pier.

It didn't take me long to pick up my pass and whiz down the gangway to

36

the pier. I didn't know where I was going but I was on my way. On the pier, I ran into a chief yeoman and a chief gunner's mate that I had been friendly with on the ship. (I was quartered in a compartment with about 90 CPO's and ate in their wardroom, a lone and elderly GI among all those salty chiefs.) We shared a cab going uptown.

The streets were a kaleidoscope of color and movement. Here was the true oriental flavor of the city. Traffic was a weird mixture of ancient and modern, with streetcars (both single- and double-decked), busses, taxis, horse-drawn gharries, oxcarts, bullocks, goats and the ever-present sacred Brahman cattle. These beasts wander at will, either in the street or on the sidewalk, and nobody gives them a bad time. Anything they want to do is okay. This includes laying down on the car tracks, whereupon traffic halts until the animal feels like getting up again.

An added touch of color were the innumerable bright crimson splashes on the sidewalks which came from everybody chewing betel nut and letting fly—*ptooie!* And it was necessary to keep a watchful eye, for they weren't particular about where they let fly, and frequently you had to dodge. The sidewalks looked as if everybody had been carrying dripping buckets of red paint. The stuff also stains the lips crimson (look Ma, no lipstick) and the teeth black.

At Green's Hotel we met with disappointment: we couldn't get a drink at that time of day, as guzzling was strictly by the clock. I left the two chiefs with some mumbled excuse about doing some shopping and wandered off on my own. What I wanted to do was to see some fishes and I didn't care if I had to bust a gut to do it, but I didn't want to get the horse laugh from those salty characters.

I knew that one part of the city bordered on the sea—not that muddy harbor—and that was what I wanted to look at. But I had no idea where it was or how to get to it. I had just gotten into service under the wire—a World War I retreat—when the army raised its age limit to 50, and although I had managed to squeak through basic training without collapsing, I wasn't anxious to walk any distance in the heat.

After I had walked a few blocks, I noticed a row of horse-drawn gharries standing by the curb, waiting for fares. (These vehicles are a sort of one-horse shay.) They were a dilapidated looking lot and the poor nags that pulled them were long overdue at the glue works. Most of the drivers looked at me as if they'd like to cut my throat; they were an evil looking bunch, or else my imagination had slipped a gear and was running wild, and I hesitated before speaking to any of them.

I looked the gharries over casually—the drivers were all giving me the eye—and finally picked one that looked to be the least dilapidated. The driver was a swarthy individual whose dark brown face was so furrowed with wrinkles that it looked like a map of the Mississippi Delta. The two gray eyebrows that hung out over his eyes like a couple of tattered awnings went up and

37

down when he talked as if they had some hidden connection with his vocal cords. On his head was something that resembled an old and rather soiled pillow case. Maybe it was a turban, but it wasn't what I'd call an inspired turban: at least it wasn't one of the Kipling jobs.

We had a merry time of it. I tried to explain what I wanted and where I wanted to go, but the only word he seemed to understand was "rupees." I tried pointing to my watch and making two circles around the dial with my finger, meaning 2 hours. Then I waved my arm in a circular motion which I hoped would indicate where I wanted to go. I kept saying "water" and "ocean," but all that got me was a couple of wiggles from those arched eyebrows and a big squirt of red juice near my feet. We finally settled upon some hourly rate and I climbed aboard, glad to have some place to sit. Then we had another argument about the top on his silly buggy. I wanted it up—the sun was beginning to fry what was left of my brains—but old Ali Baba, or whatever his name was, didn't want to put it up. I finally won that argument, but I had to get out and start to walk away before he gave in.

Little doubts were starting to nibble at my reason like mice giving the business to a piece of cheese, but I tried to ignore them as I got back in. Old Ali hit his poor old nag a vicious cut with the whip and we were off at a break-neck speed of about 2 miles an hour. The things some people will do for a look at a fish! Ah, well.

After about a half hour of clop-clopping along various streets, I noticed that we were going uphill and this, I figured, was not the way to get to the shore. I tapped Ali on the shoulder and pointed downhill, stupidly saying "water" and "ocean." Ali did was to shrug, shoot a red stream of juice over the side, and keep going. (One word from me and Ali did as he pleased.) After a short time he stopped at the side of a square and handed me a large tin can. It looked like a gallon tomato juice can. He pointed to a fountain that was spraying water in the middle of the square. I guessed that with all my hollering about water he thought I wanted a drink. I wanted a drink all right but not *that* kind, so I waved him on. Ali cranked up his nag again, undoubtedly convinced I was as nutty as they come.

After a short time Ali turned in his seat and pointed upwards. There, above a high wall, were hundreds of vultures circling about. This I knew, from reading about it, was the Parsee Tower of Silence on Malabar Hill, where they laid out the bodies and the vultures took care of the rest. Between that and the burning Ghats, I suspect a mortician would starve to death in this country. I also suspected that Ali was giving me the old tourist treatment. I was convinced of it when, a while later, he pulled up before another tourist spectacle and pointed with pride. This was the Dhobi Ghat where Bombay's laundry was given the works. It was about the size of the L.A. Coliseum and there were hundreds of Indian gals giving Bombay's linen the personal laundromat treatment in iron-banded wooden tubs.

40

I could have done without that inspiring sight, too, but it's possible old Ali thought maybe *that* was what I wanted with all my yelping about water. He certainly looked disappointed when I waved him on without getting out of his wagon.

After another period of what seemed like aimless driving I noticed we seemed to be getting away from civilization. A short time later Ali pulled up before a walled courtyard and got down from his seat. Unhooking his nag, Ali dropped the shafts and, without a word to me, led his old plug inside the courtyard and disappeared from view. Now, I thought, what kind of a deal is this?

I looked around and, except for a couple of half naked and very dirty little kids, I saw nothing. Ali had disappeared and I didn't have the foggiest idea where I was. We had traveled about so much I had lost all sense of direction. So I just sat there in the now horseless carriage and felt stupid for the minute. I thought of walking but shoved that idea away quickly for I didn't know in which direction to walk and I didn't feel like getting lost in that heat. I hoped old Ali might be just going to change horses or something but, after sitting there for 20 minutes or so, I doubted it.

I called the kids over and tried asking them where I was but all I got for that was small hands, held out palms up. I gave them a few of the crazy coins I had, which was a mistake, for soon about 50 more kids popped up from nowhere, all with outstretched hands, looking for a little gravy. I don't know where they came from but they practically mobbed me and I soon ran out of coins.

After another half hour I was getting pretty teed off and about to try invading the courtyard to see what the score was. Then the gate opened and out came Ali, leading his nag. Phew! Maybe you don't think I was glad to see that old wizened buzzard! Ali, with never a word to me, chased the kids, hitched up his old plug and climbed aboard. And away we went. Then it dawned on me, as I should have realized, old Ali and his nag had probably just been having lunch. I felt pretty silly.

Presently we were back in civilization again and before we reached the bottom of the grade, there was the ocean—the Arabian Sea—staring me in the face! Ali drove along the waterfront a ways and then stopped near what appeared to be a vast expanse of open beach. The tide was way out—about a half a mile it seemed—and there were hundreds of Indians wading about in the shallow water. Further out, others were swimming. The area seemed to be mostly sandy but there were also rocky tide pools in evidence, and these were what I wanted.

Then it dawned on me that old Ali, the fox, understood a lot more than he let on and, because we had agreed on an hourly rate, was stretching the hours as far as he could. A smart cookie, that Ali, but my resentment soon evaporated with the realization that I had finally reached my objective.

41

I took off my shoes, rolled up my pants, and hopped out and started down the beach, headed for the tidepools. The first few I looked at seemed to be devoid of any life at all, but after I had gone out some distance (the area was a sort of plateau and even when the tide was in, it must have been quite shallow) I saw some small fishes scurrying about in a pool that had very little water in it. Closer inspection revealed them to be some species of goby but they were colorless and uninteresting. Several other pools seemed to have nothing but this same little fish. I was about ready to give up (after all I was "just looking") when my eyes caught a sudden flash of yellow in a small pool. Then it disappeared. I stepped into the pool and turned over a rock. There it was! A little butterfly fish—a chaetodon—with golden yellow and black markings. It was less than 2 inches in diameter and a deep-dish cutie pie if I ever saw one.

And that was when whatever brains I had left must have oozed out of some very small hole in my head. I decided that little chaetodon was going back with me.

Marking the tidepool with a stick, I raced back to the gharry. Ali wagged his eyebrows a couple of times but said nothing until I snatched his tin can. At that point he started jabbering away a mile a minute and tried to get it away from me. We both pulled on that old tin can as if it was a turkey's wishbone until I finally got mad and said, "Oh, shut up!" Inspired repartee that was, but I knew what would fix Ali. I got my free hand in my pocket, pulled out a couple of paper rupees, and that did it. Ali let go of the can and grabbed the money while I raced back to the tide pool.

No, I didn't have a net, but it wouldn't be the first time I ever caught a fish with just my two cotton pickers, and that little yellow lambchop was in Ali's tin can in no time at all. The water in those tide pools seemed to me to be hot to the touch. I didn't have a thermometer, but I guessed it must surely be in the 90's, and I wondered how the fish stood it. I didn't know what species my little beauty was but I caught another in a second pool and, in a third, I nabbed a little bright red squirrel fish. With these three in the tin can I called it a day. I felt pretty smug, too, as I hiked back to the gharry, climbed aboard and told Ali to drive me back to the ship.

Ali gave me a look that probably meant what I thought it did, spat a red stream over the side, whipped up his nag, and away we went. For a guy that gave the impression that he didn't understand a word of English, Ali did pretty well for himself, and in a very short time we were on the street that led back to the ship. We evidently could have done the whole bit in less than an hour if we had gone directly to the beach from where we started, but that wasn't the way old Ali worked. Ali was a fox.

In spite of the heat the three little fishes in the can seemed to show no signs of distress and remained quiet, their fins waving gently. I was glad of this, for truth to tell, I was pooped and I wanted to cool off and have a little

refreshment. And I knew I wouldn't get it—the kind I wanted—on a navy ship. Just a short way from the pier I saw the marquee of the Grand Hotel, which wasn't as grand as it sounds, but was grand enough for me. I told Ali to stop at the entrance.

Without the aid of a computer I figured out what I owed Ali, based on the number of hours, added a couple of rupees for good measure and gave him five more for a tip. This, I thought, was reasonably generous. Ali evidently didn't think so, and grew quite vociferous about it. I didn't understand a word except "rupees," but anybody could understand his meaning: Ali wanted more dough. Screaming his head off and punctuating with vicious squirts of red juice (Ali could be quite eloquent with his red saliva), he was making quite a fuss as he followed me to the hotel entrance. A large crowd was gathering to watch the fun. I stood there with my tin can and was beginning to feel more than a little silly when the Indian doorman came out and asked what the trouble was. When I told him, he said that I had paid more than enough and started to give Ali the bum's rush.

I don't know why but suddenly I felt a little sorry for Ali. I set my tin can of fishes down carefully, peeled off a five rupee note, and handed it to him with the suggestion that he buy his nag a couple of oats. Ali took the money with a look that practically scorched me, then climbed aboard his gharry and beat it.

There was no bar, so I went into the dining room and sat down at a small table, directly under a whirling fan. It was fairly cool and very pleasant after the heat outside. I set my tin can down carefully at my feet after checking to see that the fishes were still all right.

An English-speaking Indian waiter in stiff starched white asked if I wished tea. *Tea!* I didn't wish tea—hate the stuff—and asked for a little of the liquid produced in the Scotch Highlands with ice and soda. The waiter was sorry, he said, but it would be another hour before it would be the legal time to serve the beverage I wanted. Nor would he go for any malarky about bringing me some in a teacup, either. No sir.

So I ordered tea—ugh—which he brought me with some little cakes, and I sat there and watched the clock with considerable impatience. To make the time go faster, I got some note paper from the desk and wrote up the day's dizzy activities for my diary.

Eventually the clock hands hit the magic hour, and there was my waiter, right on the dot, with a tall frothy glass. Ah! He was dying to see what I had in the tin can and nearly broke his neck trying to get a look. When he started dropping things on the floor so he could bend down and take a peck, I picked it up and showed him what I had. He looked at the fishes, glanced at me with raised eyebrows as if I might just have fallen out of a tree, brushed some imaginary crumbs off the table, and sauntered off. I could make a fair guess what he thought and I suspect he told everybody else too. Ah, well.

After I had undehydrated myself a little more, I decided it was time to

get back to the pier. I had been dreaming up a plan for the care of my fishes aboard ship; the clincher was to park them in my colonel's bathtub. He had his own private stateroom and bath, which had a salt water tap, and he was a pretty good guy. I felt sure he would go for it because all he had to do was put them in the tin can temporarily when he took his bath. The only trouble was that whenever they fired the 5-inch gun on the fantail, which they seemed to do quite frequently, the bathroom tiles fell off the wall from the concussion. That, I thought, we could fix by putting a blanket or something over the tub so I wasn't too worried. I had a final libation to celebrate such a fine example of improvisation, paid my bill, and carried my precious tin can out to the hot street. It was only a few blocks to the ship but I didn't feel like getting up a sweat again and I didn't want my fishes in the hot sun any longer than I could help it, so I flagged a cab and we all rode to the pier in style—me and the fishes.

My can gripped firmly in my left hand, I strode briskly up the gangway, pausing at the top to rip off a salute to the flag at the stern—navy style—and was about to snap another at the officer in charge of the deck, when the scene that met my eye halted me.

The officer was confronting two swabbies who had just come aboard with a small green parrot in a little cage. The OOD (officer of the deck) was giving the swabbies a grade-A tongue lashing which finally ended with one of the sailors releasing the bird, which let out a squawk and flew away over the pier. The small cage was dropped overboard.

Now it was my turn.

The OOD was a very young ensign with a thoroughly disagreeable face. His mouth was curled to one side in what appeared to be a perpetual sneer. His eyes were close-set and mean, and his cheeks bore innumerable craters formed by adolescent acne. He looked like a creep. From what I had heard of his conversation with the sailors, he took his responsibilities very seriously. I thought he was backing for Admiral Nimitz's job, so I suspected I might be in for a bad time.

Good grief!

I gave him a real whizzer of a salute and stood at attention as well as I could with the tin can dangling from my left hand.

He eyed the can for a moment and then ran his eyes up and down my frame as if I might be some curiosity from outer space. His chronic sneer seemed to blossom into new glories.

"What's in the can, sergeant?" he asked, his voice dripping with importance.

"Fish," I said with a straight face, then remembering my military manners, added a belated "sir." I certainly felt stupid.

"Fish?" The OOD repeated, as if he'd never heard the word. His eyebrows went up as he stared at the can in my hand, I kept my lip buttoned.

After a moment he tore his eyes away from the can—you might have thought it contained spitting cobras from his expression—and looked back at me.

"Don't they feed you enough on this ship?" he wanted to know.

"No sir." That was wrong. "Yes sir," I corrected hastily. "I wasn't going to eat them." I wondered if he thought I was a holdover from the goldfish eating kids of the 20's. This was getting pretty silly.

"And what," he demanded finally, "do you think you are going to do with them?"

Ah! What indeed?

And the "admiral" was getting impatient. I couldn't think of any lie that made sense so I told him the truth. "I was going to take them home," I got out finally, but not very hopefully.

And I guess that did it. He looked at me as if I'd slapped him (and how I wished I could have) and his face got redder and redder as he started on a tirade that would have made Bull Halsey sound like a rank amateur. What did I think this ship was? Noah's Ark? Didn't I know this was a NAVY ship? Was that the kind of stuff they taught me in the army? Who did I think I was? And on and on. And he didn't omit the old chestnut: Didn't I know there was a war on? And, how did I ever get to be a sergeant anyway?

I stood there and took it, gritting my teeth. What else could I do? I was old enough to be the twirp's father, but mighty glad I wasn't related. More than anything I wished I could belt him. Just once. But that kind of thinking only leads to the pokey and huge quantities of trouble.

Finally he ran down, much to the disappointment of the rest of his audience, the swabbies who were enjoying the show immensely. His face was still red from his efforts and I wondered what would happen next.

I didn't have to wait very long to find out.

"Give me that can," he said, reaching for it.

I was reluctant to part with it, naturally, but he was impatient and proceeded to yank it out of my hands so violently that about half of the water sloshed out and went down the front of his immaculately pressed khakis, making a long dark stain. Going over to the gangway, he dropped the can overboard. It hit the piling on the way down and spilled the fishes out into the muddy waters of the harbor.

Well, that was that.

The chewing out was over and the fishes were gone. It had been quite a day. I went below to the CPO wardroom, hoping those three little fishes could find their way back from the muddy harbor to their nice clean tide pool. I had one small consolation and that was the way that the spilled water had looked on the ensign's pants. It looked like—well it looked decidedly embarrassing to say the least, and I hoped everybody on the ship, including his captain, got a good look.

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By William Vorderwinkler
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Betta maturity

Q. 1. Can you tell me at about what age you can tell male and female bettas apart? And how? When you have a tank filled with young bettas from a spawning, they all seem to look alike. I know at maturity you can tell the difference because of the long fins of the males, but what about when they are younger and have not developed the long fins?

I have seen two together in other aquaria. Would it be worthwhile to place another oscar of the same size in with this one, or had I better settle for leaving it alone in the big tank to sulk by itself?

Ione Morris, Springfield, Oregon

2. At what age is a betta mature? I have heard a year; is this correct?

3. I had four young oscars in a large tank in which I had planned to keep only two as they grew larger. While they were still small, one of them became mean and killed off all of his tankmates. When I realized that he was actually attacking them, I tried to save the two that seemed to be in fair shape, but they died. Now the one oscar is alone in the tank. Is this common, or do I just have an unusually mean one?

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Tropical Fish Hobbyist

A. 1. It takes a lot of watching to pick out the male bettas in a tankful of growing ones. When you see two squaring off to attack each other, it's a fairly safe bet that they are two males. Keep fishing these out until you have a fairly harmonious lot. These will be your females.

2. A betta should be well beyond the point of first attaining maturity at a year. If well fed and kept in good, clean water they should be mature at 6 months.

3. Too bad you sound up with a nasty individual, but chances are that he'll lose his bad manners as time goes on. I would try getting another oscar of the same size

Salt and catfish

Q. I would like to know about catfish, specifically the *Corydoras* genus. I have read that too much salt being added to the aquarium can easily kill catfish. But how much is too much? I keep swordtails in water containing 1 teaspoonful of salt for every 2 gallons. Can *Corydoras* be safely kept in this water? What is their limit?

Gary Magruder, Fort Lee, Va.
A. True, catfish cannot "take" salt as well as many other species. But another thing is true, that the importance of salt in the freshwater aquarium has been greatly exaggerated. A teaspoonful of salt for every two gallons of water is quite weak and I would not consider it anywhere near strong enough to produce death in a catfish. Their limit? I would never try to keep them in water which contains more than a teaspoonful of salt per gallon, although I do not doubt that they could be gradually acclimated to even stronger solutions. On the other hand, your swordtails would do perfectly well in water with no salt content whatsoever.



An oscar, *Astronotus ocellatus*

and partition the large tank. This will permit the two to see each other without doing any damage. When they seem to be getting friendly, try taking out the partition. Of course, if mayhem begins, put the glass partition back.

How to stop a feud

Q. 1. I have a 5-gallon aquarium. The temperature is 72-75° F, and the pH is 7.1. My four fish are a male molly, male platy, gold medaka, and a catfish. The molly is constantly fighting with the platy. Usually when I turn the aquarium

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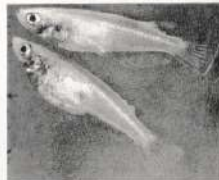
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Pair of gold medakas

light on, the molly spreads out his fins as far as they can go and chases the platy until his victim gets so tired that he can no longer swim. This also happens when I feed them. What can I do to stop this? Please don't tell me to separate them because I don't have another aquarium (mainly because my allowance is very small).

2. I was thinking of getting a couple of fancy guppies so that they might

divert the molly's attention from the platy. (You see, this is all psychological.) Do you think this will work?

Diane Adanalian, Fresno, Calif.

A. 1. A male molly is not pugnacious by nature, nor is a male platy. But put the

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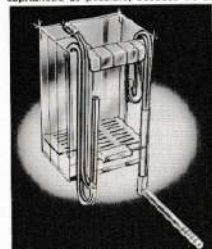
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two together without a female of either species and the scales will sometimes fly.

2. Adding a third species is not the way to divert them. The perfect diversion for a male fish, if I may be permitted to get psychological in turn, is a female fish of the same species. Instead of the fancy guppies, my suggestion is that you get a female molly and a female platy, the cost of which should not be too disastrous to your allowance.

Green discus

Q. I recently purchased a pair of green discus (*Symphodon aepifasciata aepifasciata*). I was assured that they are a pair because of the preference they have shown for each other. They are approximately 3 1/2 inches in size. I am keeping them in a 62-gallon aquarium. The

Green discus and young



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water temperature is about 85-90°F. The hardness is about 1.5 D.H. The pH is rather high, about 8, but I have been told that since I am using an undergravel filter the pH will eventually become quite acid. Do the above conditions sound favorable? I am replacing about 1/6 of the water weekly with distilled water. Is this all right? I am feeding my discus with live brine shrimp and tubifex worms. From the reading



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I have done. I have found that beef heart is a good food for them. I recently purchased some frozen, shredded beef heart, but my discus refuse to eat it. Would it be wise to let them get quite hungry before trying to feed the beef

heart? I find it impossible to get such foods as glass larvae, mosquito larvae, blood larvae, or may-fly larvae. Would a diet of brine shrimp, tubifex worms, and beef heart (if I can get them to eat it) be sufficient for them? Of course, I would eventually like to have them spawn for me.

Robert J. Pelger,
San Francisco, Calif.

A. At 3 1/2 inches they are still a bit small, but chances are very good that you have a pair if they get along well with each other. Your water temperature seems a bit high. Try bringing it down to about 80°F. Don't count on your undergravel filter bringing your pH from 8 to about 7 or below; make weekly checks to see if you are making any progress; maybe with your very soft water it will happen, but it will probably take a very long time. Replacing with distilled water is an excellent way to put back exactly what came out, without adding any more foreign substances. Beef heart to some fish species is an acquired taste. Add a bit when you give them live food, and if it gets eaten you are on the way. It might help to skip a day's feeding and then give them beef heart. Before feeding, make sure that it is fresh by thawing it and sniffing for an unpleasant odor. If it smells foul, throw it out. Your discus will do quite well on the diet of tubifex worms and brine shrimp alone in any case. Lots of luck!

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58

Cloudy water

Q. 1. Must all tanks be torn down completely and reset once a year, even if they are functioning well? If so, why?

2. All references on tropical plants make the point that plants, as well as fish, need the proper medium in which to thrive. Yet even EXOTIC TROPICAL FISHES, which I consider the best aquarium reference book, does not specify the pH or hardness requirements of plant groups. One is told how and where in the aquarium to plant them, as well as how to propagate them. Too often we novices will purchase plants to have them die in the same environment that will allow others to thrive. Is this because the study of aquarium flora is still relatively experimental, or

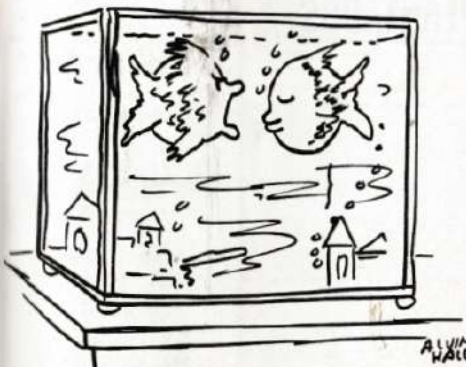
that many of the unusual plants we buy in the shops have not even been catalogued as yet?

3. My tap water is soft and ranges from a pH of 5.4 to 6.0. In this case, would it be very harmful to use stones and sea shells to raise the pH (in a live-bearing tank) rather than sodium bicarbonate?

4. The April 1965 issue of TFH carries the article on Oregon Senate Bill 68. Is there anything we as out-of-state hobbyists can do?

Pamela J. Hrink, Boston, Mass.

A. 1. It depends on a number of things, but it is always a good idea to break down a tank and reset it about once a year if you have the time. Why? It gives us a chance to really get things spic and span



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by getting at some of the places in which dirt can settle and a filter can fail to pick it up.

2. Plants, like fish, can adapt to many conditions which they would never find in their home waters. We know in most cases what these conditions are, but we frequently fail to consider the degree of adaptability these plants might have. With the proper amount of light and given clean water, most plants show a surprising ability to adapt.

3. Never realized that Boston water was so soft. If you want to raise the pH, take my advice and do it slowly. You could put a layer of crushed oyster shells in your filter and leave it there until the desired pH is attained. This eliminates putting a large teaspoon in your freshwater tank where it would look completely out of place.

4. Not much, but if my opinion means anything, the Bill will probably be in for considerable revision before action is taken on it, if any. At the moment, it has been shelved, a condition in which it could remain for a long time.

Fungus on the bottom

Q. I want to breed white clouds, I'll

White clouds



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have them in a 10-gallon aquarium by themselves. What can I use as a scavenger that will keep the bottom clean and won't eat the eggs? Will snails be all right? Without any scavengers I find a fungus appearing on the bottom even though I don't think I overfeed.

Walter Wiewczar,
 Smithtown, N.Y.

A. The eggs of other fishes, and even the eggs of their own species, are such a delicacy that most scavengers would never overlook them. Never use snails in a tank with any spawning egg layers. They have an uncanny ability to find eggs and eat them. About the fungus that appears on the bottom, this attaches itself to uneaten and fouling food. If your fish leave food on the bottom uneaten, you can conclude that either they are getting too much, or they don't want what they are getting. A good incentive for getting your white clouds to breed is to give them live foods. If you feed sensible amounts and not all

the food is eaten, the remaining food stays alive until it is gobbled up a little later. Never feed so much that there is a lot of live food left, or it is apt to overcloud your tank and you are in trouble again.

Rivulus urophthalmus

Q. I would like to breed *Rivulus urophthalmus*. Could you please answer these questions?

Rivulus urophthalmus, a pair



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1. What pH and hardness should the water be?
2. What are the fish's spawning habits, and if it is an egg layer what kind of bottom should I use?
3. Will a 3-gallon tank be big enough?
4. How long will it take the eggs to hatch?
5. In my 10-gallon tank I have two plants. They are *Vallisneria spiralis*. Could you tell me how new shoots are formed?

Joe Croman, Potts Grove, Pa.

A. 1. The water should be slightly acid and soft, about pH 6.0 to 6.5 and hardness up to about 10 D.H.

2. They spawn in plant thickets, laying a few eggs each day over a period of time. Since the spawning occurs near the water's surface the kind of bottom is unimportant.

3. Yes, but I would recommend a larger tank for raising the youngsters.
4. About 2 weeks, give or take a few days.
5. *Vallisneria spiralis* multiplies by sending out "runners." These are round, tough stems which start out from the plant near the root. Every few inches they grow



Vallisneria spiralis with runners and young plants
 roots and send up new leaves. Eventually the youngsters can be snipped off and planted wherever you like.

Driftwood

Q. I found some unusual pieces of driftwood while on vacation last year and would like to put them in my 30-gallon tank. They came from salt water. I have been boiling the wood for approximately 15 hours because I understand there are poisons in the wood which can be released into the water. Can I put them in my tank now, or do I have to prepare the wood any further?

Warren Eifers, Yonkers, N.Y.

A. It isn't so much a question of how long you boil the wood alone, but how often you changed the water while you were doing this. If you changed the water at least 5 times, I would definitely say that you are safe.

Disappearing platy

Q. The inmates of my 10-gallon aquarium generally live together in peace. However, one day, I discovered that my female platy (1 inch long) was gone. She couldn't have been eaten—none of my other fishes are over 2 1/2 inches long, and the only ones of that size are a pair of mollies and a pair of swords. I have 3 tetras and a female guppy of the same size, but none of them were touched. Could you tell me:

1. What happened?
2. How can I prevent it in the future?
3. Why is it that only the expensive fish get into trouble?

Lee Agnew, Stillwater, Okla.

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A. 1. Granting that she couldn't jump out, the only logical solution is that she died (don't ask me how!) in some out-of-the-way corner and rotted a bit before you missed her. Then she was nibbled to bits and eaten. Even a few snails could do this in a surprisingly short time.

2. Keep your fish healthy and this sort of thing will seldom be repeated. If your fish are all peaceful they will not kill each other, and if there is no disease your fish will not die from any other reason, except from natural causes.

3. In this case you only lost a platy, but in many cases we do not notice the incipient ones that die for just that reason: they are inexpensive. When we plunk down a lot of money for a fish and it dies, it is only human to complain that it is the expensive ones that get into trouble.



As it has every year for some time, the Hawaiian Guppy Society will hold another show this year. This one has been planned for August and will take place in Honolulu. I would like to remind all hobbyists, even those who will be unable to attend, that they can participate in this international show. Entries can be mailed in this year. For further information write to: Jimmy Izumi, 1405 Mamala Street, Hawaii 96817. Let us show the 50th state that we are not forgetting them and are interested in making their show the biggest success possible. P.H.

Wavy spines
Q. I recently mated a male guppy (part veiltail) with a female guppy (pure veiltail). The babies are all healthy and most of the males have beautiful, color-

ful tails, but approximately one-third of the babies have a wavy spinal cord. They've grown to the same size as the other babies and have produced babies also—healthy babies with no wavy spines. What could be the cause of this? Will the third or fourth generation have this deformity if it is hereditary? Also, some of the females are a light peachy color rather than the usual gray color. Does this mean anything? There are about 25 or 30 guppies in a 10-gallon tank at 75°F. They are fed frozen or live brine shrimp in the morning and a dry food in the evening. The plants are also very healthy. I've had the original male for about 2 years and he always produced perfect fry. I had just bought the female and these were the first young she had for me.

Nina Scozzari, Bronx, N.Y.

A. I would not advise that you use fish with deformed spines for further breeding, even if some of them have normal offspring. The reasons for this abnormality may be hereditary, but it can sometimes be attributed to not enough light, or a lack of calcium and phosphorus, as well as many other reasons. You mentioned a light peachy color; this is the result of a change in the genes which are responsible for a fish's color.

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Jealousy? No!

Q. 1. As my guppy males pursue the females they suddenly clamp their fins, shiver and back up. This happens quite frequently but only for a second or so and then they continue the chase. What is going on?

2. Do you think some guppies could get jealous of each other? One night I brought home a pair of guppies and the male had a beautiful tail. The next morning I looked into my 10-gallon tank and found that the entire top of his tail was missing. I have other common guppies in the tank along with tiger barb, a ghost glass catfish, neon tetras, pencilfish, glowlight tetras and a very peaceful angelfish. Which one do you think did it?

Sheldon Kronhaus, Sylmar, Calif.

A. 1. This is a normal part of the mating act of the male guppy.
2. You might occasionally see a mock battle between two male guppies but seldom does any damage occur. I suspect your tiger barb is the culprit.

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*Salts From
The Seven Seas*



By Alfred A. Schultz

Caught in the Net . . . I have on my desk many letters, all pertaining to the keeping of dwarf seahorses. If I had to answer all these letters individually it would get very repetitious both for you and for me. Instead in the near future I will write a complete column dealing with the raising and keeping of both dwarf and regular seahorses.

I recently visited a New York City wholesaler of tropical fishes. His stock of marine fishes surprised me. The rare royal gramma was in plentiful supply as were butterfly fish, angelfish, etc. This of course means that the East Coast will have an ample supply of saltwater fishes for sale.

This recently happened to me and I pass it along for what it's worth: I had just picked up a box of marine fishes from the airport. Upon transferring them to an aquarium, still using the same water they arrived in, I found that four of the fishes fell to the bottom of the tank and appeared to be dead. I immediately put them in a different tank with fresh salt water but they still looked as if they were dead. At that moment I was called away to the phone and didn't return to the tank again for an hour. When I did go back, I was surprised to see the four "dead" fishes

all swimming around, healthy as could be. It took a lot of research, but I finally found the answer. The fishes had been given a drug to slow down their metabolism during shipment. The rough handling had put them into temporary shock. All they needed was quiet and a chance for the drug to wear off.

Q. Would you be able to tell me how to ship (by air) saltwater fish from California to Pennsylvania?

Jimmy Yamber, Oakdale, Penna.
A. Ship via air freight, it's inexpensive and fast. Don't overcrowd your shipping container.

Q. 1. Could the following saltwater fish be kept together: a convict goby, pipefish, unicorn blenny, and a hermit crab?

2. How large a tank would I need?
3. What kind of fish can be kept with sea horses?

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4. Can starfish be kept with any other kinds of fish?
5. If I cut the limb off a starfish to start regeneration would there be any danger of its dying?

Billy Deyo, Fredericksburg, Va.

- A. 1. Yes.
2. 10 gallons or more.
3. None. Seahorses are very slow feeders and would starve to death if there were any fish present.
4. Starfish should not be kept with any other fish.
5. Yes.

- Q. 1. Can a small octopus be kept in a community tank? If it is, will it discharge ink?
2. Can you keep a sea cucumber, sea hare, sea squirt or cuttlefish in a community tank?

Kirk W. Anders, Kissimmee, Fla.

A. 1. No; if the fish causes it any annoyance it can readily squirt ink, and this is frequently the cause of water becoming fouled.

2. No.

Q. In one of your columns I have read that saltwater fishes have not been bred in a home aquarium. Yet, I have been told that there have been reports of the neon goby breeding. Is this so?

Ed Aleo, Boston, Mass.

A. There have been many reports of marine fishes spawning in home aquaria. One such report was written up in another magazine back in May, 1962. Neon gobies have spawned and the eggs have hatched, but none of the fry lived for more than 4 or 5 days. To date, I know of no one who has spawned marine fishes and has raised them to maturity.

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A pair of red-chinned panchax. Photo by Horst Abel.

The easy-to-breed killifish...

Breeding the Red-Chinned Panchax *Epiplatys chaperti*

BY LAWRENCE WECSLER

Most aquarists hesitate to attempt to breed any of the many species of killifish because they believe that all these beauties are just too hard and bothersome to work with successfully. Another reason many fish hobbyists don't go in for these fishes may be their prices. Although many of the killies are expensive

and hard to come by, the beautiful red-chinned panchax, *Epiplatys chaperti*, is not. There is always a large number of these fish on the market at reasonable prices. There is one outstanding reason for this... the fish are very easy to breed. The aquarist with only a few small tanks can breed these fish with as much success (but on a smaller scale) as professional hatcheries.

The male's body is about 2 inches long and is shaped like that of many of the other killies. There is a little swordlike extension on the bottom of his tail fin. The fish is gray to olive in color with about seven black vertical bands. There is a rectangle of more or less bright orange on the chin. At breeding time, however, the male *chaperti* becomes a veritable rainbow of colors in a maze-like pattern of blues, greens, reds and yellows. The female of this species is colored and shaped almost exactly like the male. However, she does not have the orange chin or the swordlike caudal extension. Neither does her color become as varied and startling during breeding.

There are only a few simple requirements in breeding these fish successfully. I have done it many times, using the following method. Put a pair of these fish (if available, a trio consisting of two females and one male is even better) in a half-filled 5-gallon tank containing soft, slightly acidic water. Make sure the tank is well covered, for these fish are good jumpers. There should be a floating wool spawning mop in the tank for these "top spawners" to breed in. The next night there should be at least ten fertile eggs in the mop. Take the mop out of the tank carefully, place it on paper toweling, and examine it for eggs gently so as not to injure them. Remove the eggs carefully and place them in a small dish filled with tap water at about 78°F. Add a drop of methylene blue to combat fungus. The dish should then be put in a dark place such as a closet or drawer. Now put the mop back in the tank and start all over again. Continue this pattern until the fish stop producing eggs or until you have as many as you want.

The eggs should hatch in about 10 days but it is wise to check them every day to see if they have been attacked by a white fungus. Any eggs that may have fungused should be removed or the fungus will spread to others. On the second day, the eggs may be cloudy inside but this is not fungus, just the

Aquarium Water Chemistry by Dr. Rolf Geisler. Every aquarist is continually confronted with statements recommending or warning against soft water, hard water, acid water, alkaline water, black water, brackish water, old water, new water, and other conditions hinging upon water chemistry. This new booklet presents a clear, easy-to-understand explanation of all these terms, plus instructions on how to measure and vary them. It also offers the latest and, undoubtedly, the finest salt water formula for the keeping of marine fishes and invertebrates.

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The male red-thinned parrotfish gently crowds the female upward toward some plants. This is the first step in spawning. Photo by Horst Abel.

Once up in the plants, the two press together and begin spasmodic shaking. Photo by Horst Abel.



The shaking becomes most vigorous just before the female releases an egg. Photo by Horst Abel.

development of the embryo inside. It will be possible to determine whether or not the eggs are developing properly by the fourth day. At this time it should be possible to see three little black dots inside each egg. These will become the fry's eyes and bodies.

When the fry hatch out, move them to a tank of any size which has water at the same pH as the water in the fry's custard dish. (An eye dropper should be used when transferring the fish individually from place to place.) There should be mild aeration in the tank but a filter that might suck the fry in should not be used. The fry tank should contain large pond infusoria, which can be obtained by starting your own culture with lettuce leaves or, better yet, with the commercially-available self-starting infusoria tablets. The fish quickly outgrow this food, however, and should then be fed fine-grained powdered food, micro-worms, and newly hatched brine shrimp. (When feeding the brine shrimp, don't forget to wash them in a net with cold water so that salty water is not placed in the tank.) With this diet, the fry will grow quickly and should be given additional space as they do so.

Anyone who does not wish to breed these fish might appreciate them as attractive additions to a community tank for they are neither aggressive nor scary. Their only special requirement is a large floating plant or two, for they are unhappy directly under intense lighting.



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A female *Mastocembelus pancalus* swimming up into the plants to spawn. A male joined her several moments after this photo was taken. Photo by P. Stokes.

**Breeding the Spiny Eel,
*Mastocembelus pancalus***

BY P. STOKES

I first came upon the spiny eel at our British Aquarists' Festival in Manchester, where four of the eels were for sale in a dealer's tank. They were all curled around the heater wire, and at first glance they looked like sea horses. They were attractive, not at all like our native English true eels. They were about 3 inches long, dark brown in color with numerous cream markings all the way down the body, and had a small mouth and long pointed snout.

I was so taken with the odd appearance of the fish that I bought some on the spot. On arriving home, I checked available literature and identified the fish as *Mastocembelus maculatus*. They settled down in a 24" x 12" x 12" tank quite well and accepted white worms and tubifex worms; in time other fish were placed with them, and the eels never molested their new tankmates or *vice versa*.

Six months later, on a trip to the south of England, I came across another

species in a dealer's tank. These were also sold under the common name spiny eels, but they were a lot different from mine. This species had separate dorsal, anal, and caudal fins, whereas the first ones had all these fins joined together. I purchased six of the new type. They proved to be not only attractive but breedable as well.

The new fish were also placed in a 24" x 12" x 12" tank. This tank contained young platies, about half-an-inch long. The eels were put in this tank with the little platies in order to give them the best attention and better-quality food, for I always take more interest in my young fish than I do in my adults. They were fed quite a large number of white worms, and soon they came into breeding condition. They took on a dark sandy color with very thin darker bars running vertically down the body and small dark spots on the fins. The males, of which there appeared to be two, were a little darker than the females. The four females were very full-bodied, as deep again as the males. The tank they were in was planted with broad-leaved water sprite and had a large amount of *Riccia* on the surface. Most of the time the males were under the gravel with just their snouts showing, but at feeding time they would come out quickly. They seemed to take white worms only one at a time, sucking them in singly and never in a bunch. The females had great difficulty in digging into the gravel, probably because of their greater thickness of body.

A few more weeks went by and, one day, I noticed a male and female in the *Riccia* at the top of the tank. Right away I thought that they were in some kind of trouble, but inspection proved that they were spawning with their bodies pressed close together. I knew I couldn't get a successful spawning with them in that tank, so I parted them and set up an 18" x 10" x 10" tank with a half-inch of gravel on the bottom and filled it with tap water to a depth of 8 inches. (Our tap water, I should note, is a rather hard 180 ppm.) I put in a 2-inch layer of bladderwort and *Riccia* and set the temperature at 80° F. I placed the pair of spiny eels in before retiring. Early the next morning, the pair was together again in the *Riccia* at the back of the tank. On the afternoon of that day I put in a few white worms, but the eels didn't bother with them. However, toward evening they came to the gravel to feed. The female seemed a little thinner than before, but I decided to leave them together for another day before disturbing them.

On the second day, I noticed four or five eggs near the front glass, and then there I decided to get the fish out. This was more difficult than I had anticipated; when I put the net in the tank the eels dived under the gravel. This, to my mind, was being highly unfair. After nearly a half hour I made use of a ruse that worked: I ran a pencil through the gravel and drove them into the net with it.

The eggs were hanging like small bunches of grapes, a little bigger than a pinhead and amber in color. In another 24 hours one could see the embryos forming and the eggs seemed almost black. Hatching took place in 3 days; the

78

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79



Mastomelbelus maculatus, the author's first spiny eel. Photo by Dr. Herbert R. Axelrod.

fry hung on the *Riccia* and were almost $\frac{3}{8}$ of an inch long, striped black and white, and not a bit like what I had expected.

It wasn't until the sixth day that the fry were free-swimming. At this stage, they did not swim in an ordinary manner; they swam in short jerks like fish with swim-bladder trouble and kept well in the plants. Very seldom did I see one near the gravel. Their first feedings were with prepared fry food, then newly-hatched brine shrimp. Growth was very rapid and at 3 weeks old they were $\frac{3}{8}$ of an inch long, brown in color, and still feeding on brine shrimp. They were 5 to 6 weeks old before they developed a long snout like their parents, and at this age they were able to take daphnia.

At an inch in length, most of the little eels were down on the gravel. There were about 40, and when a netful of daphnia was put in the tank they would leave the gravel like lightning to feed. At 3 months they had grown to 2 $\frac{1}{2}$ inches. The adults continued to spawn every 3 weeks to a month with no difficulty at all during July and August. I mention this because it is only at this time of year that I can get them to spawn. Whether they spawn at any other time in their native waters, I can't say.

Another method I have for working with *M. paucatus* is to wait for them to spawn in the *Riccia* and then take out the plant complete with the eggs and place it in a bare tank. This saves the bother of catching the adults, and I can watch the fry more easily. I put fresh *Riccia* in with the adults because they spawn over a period of days and I don't want to miss any possible additional eggs.

80

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