

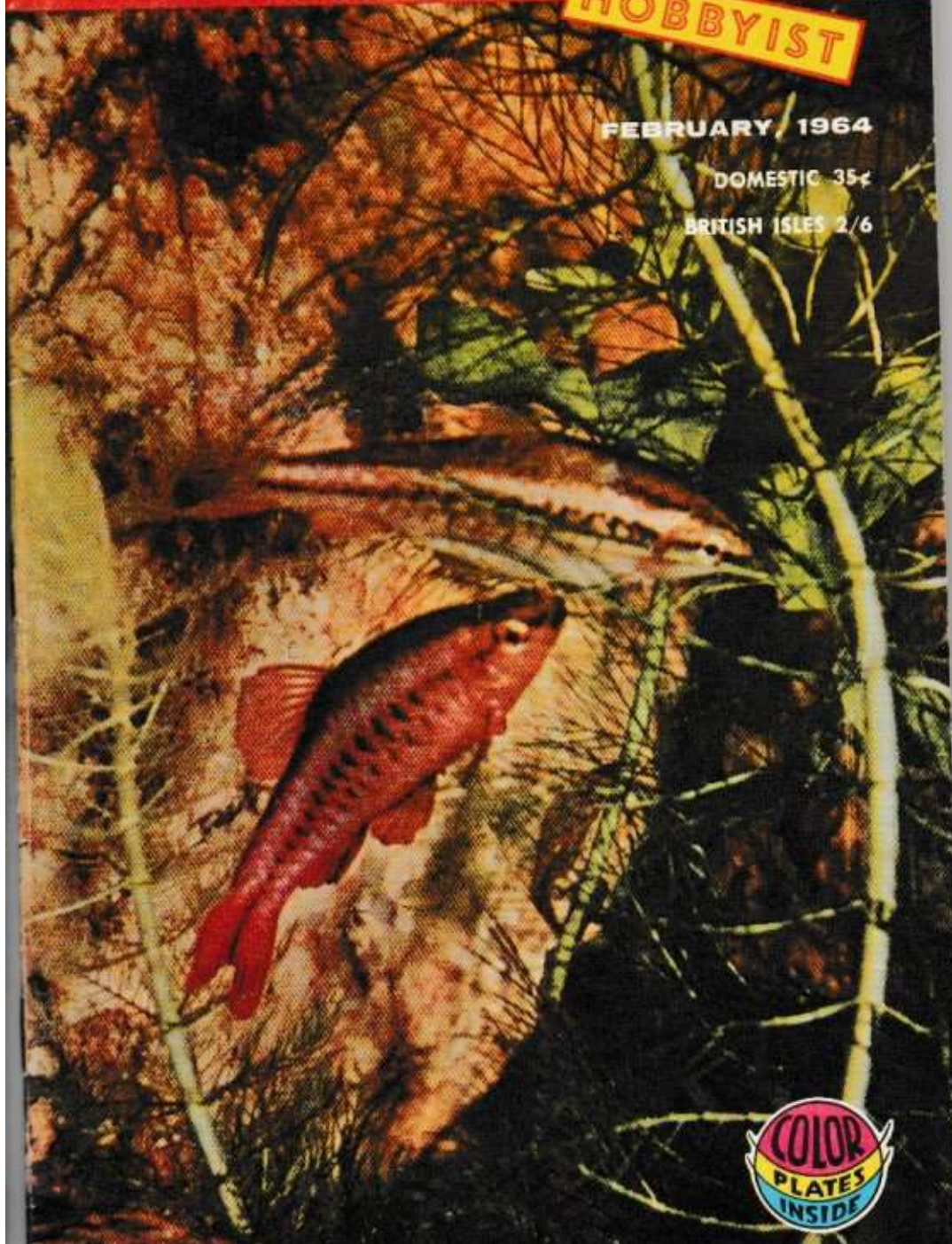
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COVER	
Featured in strands of <i>Mynophyllum</i> , a pair of Cherry Barbs engages in a spilted chase during the spawning act. Road Gang Harriot's interesting account (beginning on page 5) of how to spawn and raise these beautiful, lively Barbs. Cover photo by Hans Peter.	
EXOTIC TROPICAL FISHES SUPPLEMENTS	
Pages 33 and 34, 36 and 40. These pages are perforated for easy removal and punched to fit into the expanded Edition of EXOTIC TROPICAL FISHES.	

RATES: 25c per copy in the U.S.; 35c per copy in Canada or foreign; \$1.00 for 12 issue subscription. All back issues available at 25c per copy. Index available in every 12th issue.

In Canada Tropical Fish Hobbyist magazine and books are sold exclusively through Canadian Aquarium Supply Co., 1125 Talbot Street, St. Thomas, Ontario. All subscriptions and inquiries from Canadians should be directed to them.

In England and the western Seering area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 59 Station Road, Redhill, Surrey (London) S.E.26. All subscriptions and inquiries should be sent directly to them.

© 1964 T.F.H. Publications, Inc.
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc. at 245 Cornwell Avenue, Jersey City 2, N.J. Printed in U.S.A.

February, 1964

EDITORIALLY . . .

Good advice can only be really good if it is applied with the precious factor, common sense. Recently a friend and I were discussing the dangers of generalization where fish were concerned. "Bill," he told me, "there's only one hard and fast rule that applies to all fish. They've got to be wet!" But a person in this game has to do a certain amount of generalizing, and if he's right in about 80% of the cases he can pat himself on the back and say that he's doing as well as anybody and better than most. You just can't make a rule that will hold good in all instances. For example, you are asked how many fish can be safely kept in a 5-gallon aquarium; the person asking will seldom tell you what kind of fish he is considering. The "rule of thumb" I have laid down time and again is 1½ inches of fish for each gallon of water. This gives him 7½ inches of fish to work with. This would be fine if he decided on about 6 Cuppies, but suppose he put two 3 3/4-inch Cichlids in his 5-gallon tank? The rule is being obeyed in both instances, but a 5-gallon tank with two good-sized Cichlids in it is a pretty crowded proposition. Another case: two hobbyists have a fish which has contracted a disease. Both ask for advice, and both get it. The only difference is that in one case the fish has been sick for one day longer. This one dies, and the other gets well in a hurry. One wants to pin a medal on me, and the other thinks I should be driving a truck. Maybe I shouldn't take it so much to heart when an occasional letter comes in and tells me what a retarded cretin I am, and remember how many there are that tell me sincerely that I'm doing a pretty good job. As long as they are in the majority I am not going to worry!

William Vorderwinkler

Tropical Fish Hobbyist

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February, 1964



Bodies entwined, the male and female Cherry Barbs tremble before release of the egg. Photo by Hans Peter.

Cherries Are Ripe

Spawning the Cherry Barb

BY CAROL HONNOLD

The Barb family, as a whole, is not as popular as it should be in the aquarium world, for the simple reason that almost all Barbs have the reputation for being fin nippers.

It isn't that the Barb means to be vicious—he is just continuously hungry, so he takes a bite of whatever comes his way. He simply cannot resist the long feeder fins of an Angel or a Gourami—perhaps there is too much similarity to a tasty worm. However, if the Barbs are kept well fed, one will find that they are much less apt to snap at the other members of the community.

One exception to this fin-nipping tendency is the Cherry Barb, *Puntius nitens*. This is a beautiful rosy-colored fish that is native to Ceylon and attains a maximum size of two inches. Both male and female have beautiful reddish bodies with a black line running the entire length. The male is much more

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brilliant than the female (who is more brown than red) and has the added attraction of having crimson fins. Truly they are a colorful addition to any aquarium, and I have never found them to be anything but peaceful.

These fish are relatively easy to spawn. I set up a 5- or 7½-gallon aquarium with an undergravel filter. (This I leave turned off until the fry are free-swimming.) I like *Fontinalis* (Willow Moss) for a spawning plant, and place a large clump of it at one end of the tank. It is not necessary to weight this plant down, for it will sink to the bottom and more or less attach itself to the gravel. It is a dense plant and will do well in any light (I have even had it grow in a completely dark tank). Other plants may be used if desired, but I have never found anything else necessary. If you really want to be greedy and save all the eggs, a layer of marbles may be placed over the gravel, so that any eggs which miss the plants and sink to the bottom will be put out of reach of the parents.

The female, because she is the more drably colored of the two, and also somewhat larger than the male, is easily recognized. She should be placed in the breeding tank first and fed well for two or three days with live and frozen foods. I have found that earthworms are especially good for conditioning fish for spawning. Of course, they must be cut up into bite size, which is not a chore for the more squeamish. It pays off, though! When the female is well rounded, the male may be introduced. (I have had best results using two males to one female.) I prefer to add the male in the evening and immediately turn off the light. Usually, when I get up the next morning, the chase is on full sway.

Both fish dash back and forth in the tank. Periodically, the male catches the female and nudges her into the *Fontinalis*, where they tremble side by side. After a few such efforts, the female will release a few eggs which are immediately fertilized.

Spawning continues for three or four hours, or until the female is depleted. It's a good idea to put your fish into the spawning tank at a time when you will be home to watch them, or all you will accomplish is to feed them a good meal of caviar, for as soon as they are through spawning, they immediately hunt out their eggs and eat them. Of course, some will be eaten during the spawning process, but after the fish have lost interest in one another, their main interest is once again their stomachs—which they will fill with eggs unless you are there to stop them.

The eggs are transparent and quite small, but may be seen sticking to the *Fontinalis*. They hatch in thirty-six hours, at which time the fry cling helplessly to the plant or sides of the aquarium. In another thirty-six hours, they will be free swimming and hungry. At this time, the filter may be turned on so that it bubbles very slowly. The fry are very, very tiny and need copious quantities of infusoria. After fouling numerous tanks with my own odoriferous "home brew", I decided that infusoria tablets were much more satisfactory,

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Entering the plant thicket, the male (more intensely red) herds the female prior to spawning. Photo by Horst Abel.

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The male and female have separated, and eggs are visible. Photo by Horst Abel.

and I drop two of them into the tank daily. At the end of a week, the fry will be able to take the smallest prepared foods, which I mix with water so that it will sink to the bottom. The fry do not come to the surface to feed, so unless the food sinks it will foul the tank.

Growth, providing the fry are well fed, is fairly rapid, and the fry will be able to take newly hatched brine shrimp between two and three weeks. I also feed dry food. In this way, the fry become accustomed to both and there is no problem switching them from brine shrimp to dry food. I believe frequent feeding is the main key to successfully rearing not only Cherry Barb fry but all fry, and I like to feed every three hours, alternating dry and live foods.

If you hope to raise Cherry Barbs, or any egg layer for that matter, a primary requisite is a magnifying glass. Get the best you can afford. With

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The Cuban Hogfish, a hardy species from the Caribbean, takes well to life in the marine aquarium.

The Cuban Hogfish, *Bodianus pulchellus*

BY CHARLES BECK
Photos by the author

The Pacific boasts many exceptionally hardy fish, such as Clowns, Dascyllus, certain Butterflies, Angels, etc., while many of the Atlantic beauties require a little more attention, especially in their initial feedings. But as the hobby grows, more and more Atlantic fish are coming into the spotlight. Among these is the Cuban or Spotfin Hogfish, *Bodianus pulchellus*. Its relative, the Spanish Hogfish (*B. rufus*), appears quite frequently on dealers' pricelists and

has also proven hardy. The shape, swimming pattern, and coloration of the Spotfin Hogfish are extremely interesting. The species also exhibits a strange resemblance

Bodianus rufus, the Spanish Hogfish.






Here the author's Cuban Hogfish peeks out from behind a rock, its favorite hiding place.

to a lizard, particularly in the shape of the head, boldness of scales, and certain characteristic habits, mainly that of pecking from behind a rock with both eyes moving in opposite directions.

The predominate color of the Spottin Hogfish is red, ranging from blood red to a deep coral. This color appears on the upper and lower portions of the fish, separated by a horizontal snow-white stripe. The upper rear third of the body is a bright lemon yellow. A closer look reveals the anal and dorsal fins are fringed with violet. The pectoral fins each have a black spot on

their outer tip, giving the fish one of its common names; "Cuban" Hogfish, no doubt, refers to its abundance in that Caribbean area. It is indeed one of the most striking of the Atlantic fish. More important to the hobbyist, it is hardy.

Unlike most reef fish, this species is almost entirely carnivorous, accepting vegetable matter only rarely. The author's Cuban Hogfish, named "Castro," has been doing well on a diet of rich red meat. It is a peaceful fish and compatible with even its own kind, a merit which not many other reef fish can boast.




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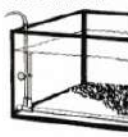


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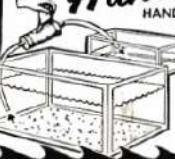
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What Do You Do?

BY CRYSTAL GORDON

What do you do when one of your favorites develops some disease or other, flops over on its side in misery, and prepares to join its ancestors? Well, if you're an expert, you just diagnose the illness and take a quick look through your supply of commercial aquarium remedies, pick out the remedy that is most effective against the illness you've diagnosed, and treat your fish.

If you're anything at all like me, you're still in the amateur stage of fish-keeping, not too expert yet, and fired up with the yearning for more knowledge of your hobby. You probably have a growing collection of the books on tropical fish and aquarium management and a shelf full of TFH booklets and back issues. So you rush for the bookshelf and look up everything you can find on diseases and compare your fish's symptoms with those in the books.

Case in point: One sick Discus, just cured of a mild case of Ich, but still not doing very well at all and still sick with something. His color is very dark and dull, he's lying over on his side at the bottom of the tank, and there's obviously something very wrong here.

Within hours, the sick fish had a very advanced case of eye fungus. Also a doggoned sudden case—in the morning there hadn't been a trace of anything in his eyes, yet by evening there was a thick, cottony glob of the stuff covering both eyes, and he was really sick.

Now we have a valuable fish with a dangerous disease; it's been

diagnosed, so we turn to the books to find out what to do about it. It turns out looking like a fairly simple job. The book says to run down to your friendly neighborhood druggist and obtain a 1% solution of silver nitrate and a 1% solution of potassium dichromate, and paint it on the fish's eyes.

I don't know what any of that stuff is, but I figure said friendly neighborhood druggist does—that's his business, after all—so I scribble the names down on a slip of paper and drive on down to the friendly neighborhood corner drugstore.

What the books don't say is that silver nitrate and potassium dichromate are a pair of highly poisonous chemicals and that your friendly neighborhood druggist isn't about to give you any of it without a prescription! This particular friendly neighborhood druggist was also an unfriendly, unpleasant individual who probably majored in Advanced Nasty. If there is anything to this reincarnation business I hope in his next life he's a Discus with advanced eye fungus!

So what do you do? I drove home again and presented my husband with a mild case of hysterics over the whole mess. It was rather late in the evening, and neither of us had any idea how to go about getting a prescription for a fish.

My husband finally called the family doctor at his home, and the two of us tried to explain the situation. It wasn't easy: how do you tell your doctor you are in dire need of silver nitrate and potassium dichromate (by this time we'd even

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learned to pronounce it) as soon as possible because your fish is sick? I'm sure Doc has us pegged for our friendly neighborhood mental institution any day now.

Still, he was wonderfully cooperative and very seriously took down the information. He told us to relax and that he would call the pharmacist he deals with. He said the pharmacist would call back, and "Mrs. Gordon, you take a tranquilizer!"

The pharmacist did call a little while later and said that he had the silver nitrate, but the potassium dichromate wouldn't be available until morning—drugstores don't stock it and it's almost impossible to get hold of on such short notice. He'd been calling all over town for it, but there was none of it to be had that night.

What do you do? We drove over and got the silver nitrate, anyway, and the friendly but not neighborhood druggist promised to call as soon as he got the other stuff. I figured the poor old Discus would be defunct by then, but at least everybody was trying to help save him.

True to his word, the druggist almost broke his neck to have my potassium dichromate as soon as he could, and at 10:30 in the morning he had it for me. To my surprise, the Discus was still flopping, but he was in bad shape. I made the six-mile round trip to the drugstore and back in eight minutes—through traffic!

The Discus didn't think much of being put into a bowl and having all that goop put in his eyes, and for such a sick fish he did a good job of thrashing around and showering me,

the table, and the floor with about a gallon of water. He's getting used to it now, though—he's had several treatments, and the fungus is very slowly losing ground.

I still don't know if he'll make it. He's playing a yo-yo act: one minute he's straight up and swimming with his colors normal, the next he turns dark again and sinks into a stupor.

What do you do? Just keep up the treatments, watch him, and hope. Mostly hope, and hard, too.

An afterthought: I happened to read the prescription label this morning where it gives the doctor's name, the prescription number, and so on. Under that are the directions: "For Richard Gordon (that's the Mr.): Use as directed in fish book."

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News from the Plant Growers

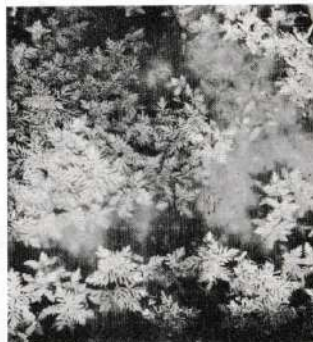
BY HANS PETER

My work with TFH Publications puts me in touch with most of the dealers and breeders in this country. Recently my travels took me to many of the Florida nurseries. Usually there is something new going in these places, and this time was no exception.

At Sunnyland Fish Farm in Miami I got a warm reception from Bill Sternke. He was happy to show me a plant which he calls "Baby Saver." This one came originally from South America. It arrived with a shipment of other plants and was included by mistake. What actually came in was a small piece, but Bill was quick to realize that this was something he hadn't seen before, so he put it out to grow. He found it was comparatively easy to propagate and looked attractive floating as well as planted in the bottom gravel of an aquarium. The plant is propagated from cuttings which take root when planted in the aquarium gravel or even continue to grow if left floating. Bill raised it in alkaline water, where it did very well and did not get brittle.

Nobody can go wrong with this plant, whether he is a beginner or experienced aquarist; it is not a problem plant.

Another newcomer is an *Apogon* species which is similar to *A. fenestratus* in leaf structure. The leaves resemble the pattern of the famous Madagascar Lace Plant, but are not completely perforated. This one is a profuse bloomer,



The new South American plant being cultivated by Sunnyland Fish Farm looks like a cross between Water Sprite and Water Wisteria.
Photo by Hans Peter.



The New Ceylonese Lace Plant. Photo by Hans Peter.

making it a big attraction in any aquarium. It makes a pretty center plant because of its pleasing apple-green leaves and rather compact shape. The plant originally comes from Ceylon and for this reason Bill calls it the Ceylonese Lace Plant. He brought it in via Germany some time ago. There cannot be very many on the market as yet because to the best of his knowledge he is the only one who produced it in this country.

This is a slow-growing plant that can only be propagated from seed. A pollination must take place between the blossoms of at least two plants. The blossom stem floats on the surface of the water, and the blooms are pinkish-white in color.

At Albert Greenberg's Everglades Aquatic Nurseries in Tampa I was shown a new *Ambulia* species. This is a very graceful member of the genus, and is an entirely new plant which Mr. Greenberg is introducing to the hobby.

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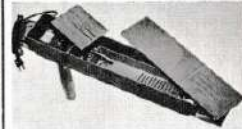
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Your incandescent bulbs are old-fashioned!

Fluorescent Lighting

BY WILLIAM VOEDERWINKLER
Photos by Patt Engineering & Mfg. Co.

The old standbys, incandescent bulbs, have much to recommend them as a source of light in the aquarium. Primarily, they are simple as well as inexpensive. There is also a great deal of flexibility where output is concerned. If the output is too great, screw in smaller bulbs; if too small, it is just as simple to put in larger ones. But there are other things which must be considered: one is heat. All of us have gotten painful reminders of this when we accidentally brushed against a hood with a light burning in it. The water is also overheated from an incandescent bulb burning close to the surface, and although the fish can take refuge in cooler places, the plants are not so fortunate, and they frequently suffer.

So much for incandescent lighting; let us take up fluorescent illumination. Most hobbyists are primarily concerned with costs. Of course a fluorescent fixture costs a little more to begin with. But the upkeep is considerably less, so in the long run you may come out ahead. A small fluorescent tube may put out as much light as a pair of incandescent bulbs



Obtain Conversion Fixture as shown in photo. Conversion fixtures are available for 14 Watt — 15 Watt — 20 Watt — 30 Watt fluorescent lamps.

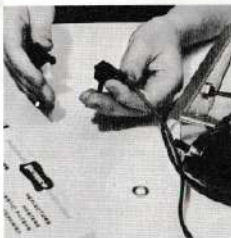
Remove knob and bolt which holds wiring.



Remove socket and portion of wiring harness from incandescent reflector.



Remove plug from cord so that complete incandescent wiring can be removed from reflector.



Knob and plug removed, and cord being unlaced from reflector.



Complete incandescent wiring harness removed from reflector.



Lace cord from ballast thru grommet, and tie strain relief knot.

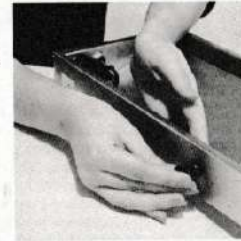
Connect wires with electrical wire nuts included with conversion fixture.



Fasten starter switch assembly to reflector by inserting "push button" thru appropriate hole in reflector, and secure in position with ferrule.



Wiring placed within channel of stainless steel fixture.



Conversion fixture fastened in position by means of bolt and knob.

Completed conversion with fluorescent lamp in position.



many times their wattage. The light is spread evenly over the entire tube surface, not concentrated in a small space, as with an incandescent bulb. Heat is practically negligible and therefore no problem.

Many hobbyists complain that their fishes do not "show up right" with the fluorescent lights, or that plants do not flourish as they should. Best answer to this is the new Sylvania "Gro-Lux" tube. This light picks up fish colors (especially red) very well and will make a startling display of a tankful of fish like red Platies or Swordtails, but a word of warning must also be injected: don't have the light beating down on a tankful of fish which prefer to swim near the top, without providing some protection in the form of floating plants. So successful has the "Gro-Lux" tube been that there is little doubt that in the near future some of the other manufacturers will come out with a similar product. Whether this will be as good, better, or worse remains to be seen.

The accompanying photos serve to show how a hood can be converted to house a fluorescent unit. This is not necessarily a "Gro-Lux" tube; it may also be used for any of the other fluorescent tubes. It may perhaps require a bit of ingenuity to adapt this unit to other hoods, but the design is so simple that no great difficulties should be encountered.

Get the Most from Your Undergravel Filter

BY RED NICHOLS

Director, Jungle Aquarium Laboratories

In the course of using and selling thousands of undergravel bottom filters of several makes over a period of many years, I have gathered quite a few facts of general interest to aquarists.

The basic idea of an undergravel filter is to let bacteria eat aquarium waste products instead of removing the waste products from the water by other means. The biggest advantage of this method is the minimum of care needed to do the job. When properly done, undergravel filtration is so effective that the water remains crystal clear for periods of several years with absolutely no attention from the aquarist. In very few cases is the water suitable for all fish for that long, however, as we shall discuss later in this article.

Everyone is familiar with the pleasant odor of rich humus from the floor of a forest, and everyone is aware of the tremendous amount of organic material that disappears into this humus each year. Falling leaves, limbs, tree trunks and even picnic waste is consumed by bacteria in the soil and turned into rich, healthful plant food.

With a good undergravel filter we can encourage certain bacteria to do a similar job for us in our aquariums. As in the forest, there are limits to how fast these bacteria can change waste to plant food, and there are certain conditions that must be met to assure their full co-operation in our plans.

In all undergravel filters the water flows down through the gravel and returns to near the surface of the water. This flow pattern brings organic waste down between the gravel grains where the bacteria live and returns the resultant conversion products to the main body of water in a continuous flow. The gravel itself is a major item in encouraging our bacterial janitors in their work. If it is too fine, the waste material cannot sink down to the proper level of activity in the gravel, and too fine a grain of gravel therefore causes much of the waste to accumulate on the surface of the gravel and remain uncaten by bacteria.

If, on the other hand, the gravel is too coarse, the waste goes in easily and is converted, but also food normally eaten by bottom feeding fish drops out of their reach and causes an unusually high concentration of bacteria in the gravel and a rapid change of pH of the water. This change is always to the acid side and is highly toxic to many fish and plants.

The right size of gravel for all bottom filters is 6-20 or 8-20 quartz gravel. This particle size rejects all but the finest food grains, easily accepts soft fish droppings, and encourages healthy plant growth. The numbers "6-20" are a

standard measurement in use throughout the United States and mean that all of the grains will pass through a mesh of 6 openings per inch and none through a mesh of 20 openings per inch. Quartz gravel is recommended because it is relatively inert and not soluble in water to any noticeable degree. If a soluble gravel is used, results will be poor to unacceptable. Marble, shells, and limestone are among the most soluble materials in fresh water and should not be used, as they will soon harden the water to a point where many fish and plants will not do well.

A suitable depth of gravel is 2 to 4 inches. A depth of less than 2 inches will not allow plants rooting space and will not give the bacteria enough room to live in the numbers sufficient for a good cleaning operation.

Over 2 inches is fine if desirable from the standpoint of looks, as there seems to be no upper limit in depth for excellent operation. However, a tank half full of sand seems to be missing the idea of an aquarium as a place to enjoy watching fish.

The filter itself should meet certain minimum standards. The tubes bringing air down into the filter and returning water from the filter should have a strong connection to the filter body. If this area is weak and flimsy, the tubes may come loose and have to be re-inserted into the filter body. It should happen to you a few times in a beautifully planted tank, you may wonder if the few pennies saved on the purchase were really worth the extra troubles you bought.

Food with a high protein content is most satisfactory, as it is more fully used up by the fish. A high content of cereal fillers makes the food cheaper, but a great deal more must be fed to keep the fishes satisfied. This, of course, makes more waste and therefore a harder job for bacteria to do. The bacteria don't mind the work, but here we come to the main problem we wish to avoid.

In converting fish wastes to desirable plant food we also have a by-product of acid being formed. This acid should be kept to as low an amount as possible, since the live-bearing fish generally do not like acid water. Heavy overfeeding of any food, particularly cereal foods, will over-acidify the water in a very few months. This causes poor quality livebearing fishes and small leaves on all plants.

The plant population of an aquarium equipped with an undergravel filter is in itself important, for plants are almost as essential to the full cycle of waste conversion as the sand.

If real live plants are not used in a tank filtered by an undergravel filter, the cycle of waste conversion is incomplete and will not function properly. Some of the easiest plants to grow are *Hygrophila*, *Vallisneria*, *Cabomba*, *Anacharis*, *Ceratophyllum*, *Water Wisteria* and *Water Sprite*. If these plants do not grow satisfactorily and all the preceding rules are followed it is very likely the filter is being given too much air. This allows the bacteria to re-process the water too often and consume the plant foods they have made. If

Tropical Fish Hobbyist

the air bubbles out of the large tube at a leisurely rate, all of the plants mentioned will grow rapidly.

To determine whether you are feeding too much, stir lightly into the gravel every few weeks and notice the condition of the gravel grains. Overfeeding will cause the gravel to be caked up to half an inch in depth. This caking or adhering together of the gravel grains is the direct result of bacterial colonies in the surface sand.

The final item to understand is the proper length of bubble tube needed to give best results. All undergravel filter air lift tubes work on the principle that a water-air mixture is lighter than water alone and will therefore rise when surrounded by water. The longer the tube the greater the lifting power of the tube. Thus we can get more water movement by using the tallest tube possible in the aquarium. In the case of the undergravel filter, we achieve the greatest amount of filtering by extending the tube to just below the water surface of the aquarium. The tube must never be above the water surface at the outlet, or the rising water column will have to lift the dead weight of any water above the tank surface level. If the bubble tube is too short, the pulling power of the tube is not sufficient to cause proper water flow. In most cases it is better to use a bubble tube half the height of the total water depth, for two reasons. In the first place we usually depend partly on the air released from the bubble tube to aerate the aquarium water and, since the greater the distance it rises above the bubble tube top, the better the aeration it gives. The second reason for a half-high bubble tube is to decrease the water flow. Remember that too great a flow removes the plant food we want for healthy plants by re-cycling the water too often. Nitrogen-consuming bacteria multiply in the sand of rapidly flowing aquariums and remove the food the plants would normally get. This is indicated by small leaves and long spindly stems.

If air stones or air-operated ornaments are used in tanks filtered by undergravel filters, water currents may cause sediment to be swept around in an undesirable manner. This can be kept at a minimum by reducing air flow to these extra outlets or increasing air flow through the filter tubes to increase the gravel's drawing power.

READ IT NEXT MONTH IN TROPICAL FISH HOBBYIST
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BY WILLIAM VORDERWINKLER



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MAIL CALL

If you have an aquarium question and cannot find the answer in any of the standard reference texts, send it to MAIL CALL. Each month this column will publish the most interesting questions received and their answers. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245-247 Crampton Ave., Jersey City 2, N. J.

Color changes in a Betta.

Q. I have a male Cambodia Betta which was purchased in Florida and brought to Detroit. It had a white body with red fins. After the first spawning, his body turned red and remained that color until the second spawning, then it turned blue, and has now turned red again. The first spawn is white with red, the second is white with blue. Your comments would be interesting. Further, I have several Split Tail Bettas which are in the process of

spawning and find them beautiful. There should be more Butterfly Bettas on the market.

C.O. Van, Detroit, Mich.

A. You don't have somebody pulling a "switcheroo" on you, do you? I have never heard of a Cambodia changing colors like that, and it's hard to believe. However, after all these years I'm just about ready to believe anything. Yes, the Split-Tail Betta is a beautiful fish. Last time I saw Butterfly Bettas was up in Canada a couple of years ago, and I see each year. The strains has almost died out, and should not be allowed to do so.

Leeches. Q. I have just begun subscribing to Tropical Fish Hobbyist. Today I made an astounding discovery and I thought that it might make a good item for publication: about three days ago my tank developed a bad case of leeches. I tried everything to kill these pests but nothing seemed to work. Then I decided to try some methylene blue



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(5%). To my astonishment this chemical stamped out over 2/3 of the leeches!
David Sheen,
Altadena, Calif.



leech.

A. A tank isn't usually overrun with leeches unless they have been left alone for a long time. Usually we only find one or two, and they can be netted out and destroyed quite easily. However I am publishing your letter for the benefit of those few whose leeches have gotten the upper hand.

Foods and temperature.

Q. I have at present a tank with Zebras, Neons, a Betta and three scavengers. At present I am feeding them live foods such as brine shrimp, worms, and also some dry foods. My question is: what other live foods can I add to their diet? Also, what is the best average temperature for these fishes? At present I keep their tank at 75° F.

Joseph Guida,
Richmond Hill, N.Y.

A. Live foods vary in availability with the seasons. By "worms" I assume you mean Tubifex worms. If you have a fairly cool spot to keep them, a culture of white worms will provide a good occasional meal. Another good live food which is becoming available lately and is easily cultured is wingless fruit flies. There are other foods which can be bought and are almost as good as live foods: fresh fish roe, finely ground beef heart, and many others. Your peishop has a good variety at all times, and they are an excellent substitute in the cold months when there is little live food to be had. As for your water temperature, keep it where it is one or two degrees higher.

Green water, etc.

1. I read in a fish book that aged green water is sometimes helpful for a very sick fish; is this true? Wouldn't the oxygen supply be reduced?
2. How do you preserve a prized fish?
3. How do you sex Goldfish?
4. What is the average lifespan of Goldfish and Angelfish?

Joyce Darrington,
Winslow, Maine.

A. 1. About thirty years ago I worked for a very short time for the Aquarium Stock Company in New York City, when they were a small store on the second floor above a food warehouse. A large tank was kept in the window where the sun beat in and the water was usually the color of pea soup. Instructions were to throw in any sick fish into this tank, which was not medicated in any way. We lost a few fish, but most of them came through very nicely. Yes, oxygen would be reduced somewhat during the night, and a tank like this should not be crowded.

2. There is an interesting article on this subject in the May '62 issue.

3. Sexing Goldfish when they are not breeding is a more or less hit-or-miss proposition. When breeding the females show swollen bellies, usually a little more on one side than the other, and the males develop breeding tubercles on the gills.

4. When kept properly and in good surroundings, a Goldfish can attain the



Closetup of head and gill area of a male Goldfish, showing tubercles.

age of 50 years or more. Angelfish frequently get to be 10 years old.

Crowded tanks.
Q. I have two 10-gallon tanks which are "twins." They are exactly alike. They are both near my window and they receive air from the same pump. They have the same number of fish and the same setup. But one is usually 78° and the other about 80°. Why is this, and what can I do about it?

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GEORGE HANSEN
BOX 414TH ST. JAMES, N. Y.

2. I have a broken airstone for my 3-gallon tank. Will I be able to use it if I put it together with a small amount of cement?

3. I would like to take an exception to the rules about having too many fish in a tank. I raised 30 baby Guppies to maturity in a 3-gallon tank with a small filter and many plants, snails, and leeches without one loss since birth. Also, in each of my 10-gallon tanks I have 35 large perfectly healthy fish. I feed them a variety of dried foods rounded out with Tubifex worms and brine shrimp.

Walter M. Barnett,
New York City, N.Y.

A. 1. Obviously your difference is in your heat source. Is the warmer tank near a radiator? Does the thermostat work properly? Is the heater unit of the same wattage? Have your dealer check the heater and replace the defective element. If you want to be sure it's your heater, switch them in your two tanks and then check the temperatures. If the colder tank becomes the warmer one, you have found your culprit.

2. If you were in a position where you could never get another airstone, I'd say go ahead and try fixing it. But for only a very small price you can get a new one and not have to worry about jeopardizing the lives of your fish, which are worth many times the price of a little airstone. Thrift is a wonderful thing, but beyond a point overdoing economy becomes foolish.

3. Skating on thin ice is fun until the ice breaks, and that is what you are doing. You can overdo and as long as you pump your fish you can get away with it. But run into trouble just once and what would be only a slight and easily remediable situation in a properly populated tank becomes a disaster of major proportions in a crowded one. It's as simple as that!

Tropicals—in Greenland?
Q. Would you be so kind as to send me by air mail dried eggs of different

tropical fish species? I live in Greenland and have tried to get fish alive from Copenhagen by air-mail, but they all died during the journey and now I have an aquarium with nothing to put in it. My hope is therefore to receive some eggs and instructions and then see if one can make it in this way.

Arne Hammer,
Faeringehavn, Greenland.

A. You pose an interesting problem, Mr. Hammer. The trouble with sending fish eggs by air mail to an out-of-the-way place like Greenland is that somewhere along the trip the eggs would be chilled and die, which is undoubtedly what happened to the fish you received from Copenhagen. The eggs are practically as perishable when chilled as the fish themselves. If Faeringehavn is in direct air connection with Copenhagen, I would suggest that you get in touch with the airline authorities and see if you can have the fish shipped in a heated section of the



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plane and meet the shipment when it arrives. If they are not chilled at any time, the fish should arrive in good shape. As for eggs by air mail, it is impossible to avoid getting the mail bag chilled at some stage of the trip and killing the eggs, unless you get them from Copenhagen and they are given the same special treatment that your fish shipment would get.

Driftwood and water problems.

1. How can driftwood be cured and how can it be stopped from floating?
2. What is the best pH and DH for Clown Loaches and Red Tail Sharks?
3. How do you make gravel acid or alkaline?
4. Can Discus and Angels be kept together in the same tank?

Joseph Clifford,
West End, Md.

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A. 1. Driftwood can be cured by boiling several times, using different water each time. This will cause it to become partly waterlogged, and to hold it in place on the bottom it can be roughed down with a rock.

2. Soft water which is about neutral seems to be the best.



Clown loach.

3. The idea is not to make gravel acid or alkaline. Gravel should be very close to neutral and we have any effect on the water with which it comes in contact. Then the acidity or alkalinity of the water is adjusted, not the gravel.

4. Yes, Discus and Angelfish can be kept together very well. They are closely related and there is a great similarity in habits.

Koi.
Q. Your article "Koi, the New Japanese Colored Carp" in the October issue, caught my interest and I was wondering if these Carp have been imported to the U.S. mainland yet.
Here's an idea I would like to pass on to other hobbyists: in your last issues you have included some supplements to *Exotic Tropical Fishes* and I have found that these, when properly framed, make nice informative pictures for a fish room. Placing them above an aquarium in which you have the fish is another idea.

Blaine Browne, Arvada, Colo.
A. The Koi is not the ideal aquarium fish unless you have young ones. It makes an

excellent pool fish, however. *Koi* are available in Hawaii, and some of the West Coast dealers have begun to stock them. Until they are produced in quantity the price will no doubt be high, but if the demand is great enough and the breeders get busy, they may some day rival Goldfish in popularity. Thank you for your excellent suggestion.

Spawning Angels.

Q. I have run into difficulty spawning my Angels. They were spawning freely until last January. No spawns came until May, when they started up again vigorously. Then came June and no spawns since. I have tried the following without success: 1. Live food—brine shrimp, white worms and *Daphnia*. 2. Carefully cleaned tanks. 3. Water from other sources. 4. Sodium biphosphate to acidify the water. 5. Consulted others whose fish are spawning but don't know why. Perhaps it is due to the summer drought and consequently changed water. What do you think?

John Lusk, Oakland, N.J.

A. I presume that your temperature is fairly constant. Yet, your water may have undergone some kind of a change, but you mention using water from other sources as well. Sodium biphosphate usually causes only a temporary acidity, unless your water is very soft. The probability is that your fish go into

an occasional rest period, when the eggs in the females stop developing for a while. This is not unusual with Cichlids, and keeps your fish strong and healthy. Sometimes when they have gotten their rest and they should be snapped out of it, frequent changes of about 25% of their water with fresh water does the trick.

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Tiger Barbs.

Q. About two weeks ago I purchased two Tiger Barbs. They were put in a 10-gallon tank with assorted Guppies and cglayers and one smaller Barb. In about two days the small Barb died. His tail had been chewed up and he had lost his color. The largest of the three had been chasing him ever since he was introduced into the tank. Now he finds pleasure in chasing the other Barb around the tank. Is this standard behavior for Barbs?

Bryce Ahlstrom, Granville, Ohio.



Tiger Barbs.

A. Most of the smaller Barbs are quite peaceful, but the Tiger Barbs are sometimes unfortunate exceptions. A large well-planted tank with about a half-dozen or more of their own kind, all about the same size, is usually the solution.

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Q. I have a 15-gallon tank with Angelfish, Guppies and Zebrafish and I wonder if *Betota gexyi*, *Aphyoseion*



A pair of Rivulus.

arnoldi, and *Rivulus* would do well in this community aquarium?

2. In my community tank two Angelfish died while the other fish (including other Angelfish) were perfectly healthy. They died very suddenly

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and when near death swim wildly on their side. What may have been the cause?

3. In which back issues may I find information on raising Seahorses?

F. Wisinski, Calumet City, Ill.

A. 1. Let's take them in order: *Betota gexyi*, although they are reputed to be peaceful, are also accused occasionally of

nipping fins. I have found the ones I had to be model citizens. *Aphyoseion arnoldi* would probably be very unhappy in the sort of water they would get in a community tank. *Rivulus* of practically any species are very shy in a community tank and would spend most of their time hiding.

2. This is a stumper! The only thing that could have happened is that two of your Angels got hold of something which was highly poisonous, and the rest did not.

3. October 1959 has an article. If you have only the one 15-gallon tank you might as well forget about keeping Seahorses; they live in salt water.

Crayfish escape artists.
Q. Recently I read in the April issue an article titled "The Overlooked Scavenger" by Fred Howard. It was about using crayfish as scavengers in aquariums. My friend and I decided to try this idea. We went out and caught

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a few and put one in each tank. Shortly afterwards they disappeared. Later we found them on the living room floor. Both aquariums were covered and not completely filled. What can be done to keep the crayfish in our tanks?

Randy Eastep, Shippensburg, Pa.

A. All I can say, Randy, is that there must be some pretty smart crayfish around Shippensburg! Keep your tanks well covered, and use small crayfish, not those big enough to pry open a heavy glass cover. How yours did in a tank which was not completely filled is a puzzle to me, and I am sure Mr. Howard would find it one as well.

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Guppy Corner



By Paul Hahnel

advice that you can give me would be greatly appreciated.

Arthur M. Parker, Waterville, Maine.

A. At the beginning of their lives the females will soon to have round tails. To "make" large tails, your fish must be provided with the best environment. Also, there is the old story of selecting the best male and female for further improvement of the strain. The foods you mentioned might not be sufficiently varied. The varieties of foods I feed my fish have been listed in this column many times.

Gyrodactylus.

Q. I have a Guppy problem which I hope you can solve for me. I have six 15-gallon tanks set up with fancy

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Producing large tails.

Q. I recently bought a pair of square-tailed Guppies from a man who lives in a nearby town. The male bred with a square-tailed female of my own stock, but almost all of the young have round tails. Why? I crossed a red veil-tailed female with a blue-tailed male. One of the young males shows red and lavender coloration but has a small square tail. I would like to start a strain of Guppies with the coloration mentioned above but would like to develop larger tails in this strain. My Guppies are in a 20-gallon short tank, and I feed four times a day with several kinds of dried foods, dried *Daphnia* and live brine shrimp. The tank temperature is 75 to 78°, the pH is 7.0, and the tank is lighted five to eight hours each day. I have Water-sprite, *Vallisneria* and *Cabomba*. Any

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Guppies. When my fish reach approximately three months of age they develop a sickness that I cannot cure, and I lose tank after tank. The fish begin by going thin and lying on the bottom with no appetite at all. After a week or so they begin to lose their balance, standing on their heads and rolling about with no sense of direction. They appear awfully weak and one by one they die. I have tried every treatment in the book and then some, but nothing helps. Incidentally, this sickness seems to affect the females more than the males. Lately I have been dumping the whole tank and setting up once more with a sterilized tank, new gravel, plants, etc. But I must solve this problem or give up this hobby.

Don Pneski, Midlothian, Ill.

A. After reading your long description about the sickness of your Guppies, I have come to the conclusion that it must be the parasite known as *Gyrodactylus elegans*. There are always a few present in the aquarium. Pollution of the tank water through excessive fish droppings provides an ideal condition for the parasite to multiply. There are many cures. The simple ones are salt and formalin. I would advise that you take your fish to a proper authority and find out if my diagnosis is correct.

"German Guppies."

Q. About a year and a half ago I purchased a "heavy" female of a strain called "German Guppies." These were supposed to be a high-class Guppy imported direct from Germany. Later I found them to be Red Veils. Since they are not what I wanted, I wished to develop my own strain. But I need some professional help.

1. First, live foods are impossible to get around here. What could I use to replace them?

2. Are the worms found in foods that have spoiled safe to feed fish?

3. If I develop my strain, could I cross it with a Blue Veil with successful results?

4. What would be the best method to establish this strain?

5. Because of the great amount of time involved to determine the size of their tails, would there be any way to speed up their growth?

6. Do you use any plant besides Water Sprites?

I enjoy your column very much; keep up the good work!

Gary Dawson, New Brighton, Pa.

A. 1. The question is impossible to answer, because there is no real substitute for live food.

2. I would not expect my fish to eat the stuff.

3. As your so-called "German Guppies" turned out to be a red strain, I can see nothing wrong if you crossbred them with a Blue Veil strain.

4. Use the female from one strain and the male from the other, or vice versa.

5. Growth can be forced by the use of higher temperatures and frequent feedings, but the result is a fish which is more vulnerable to disease and considerably more short-lived. Better to be patient and raise your fish naturally. The results are worth the extra effort.

6. I use only Water Sprite.

New (?) breed.

Q. My brother and I think we have a new breed of Guppy. It is short, with black outline around the tail, with red, orange, and yellow spots in the center. It has a pinkish blue sheen on the body. If it is not a new breed, what kind is it? How much is it worth?

Edgar & Rob Borchardt, Kenosha, Wis.

A. In your case, it is known that the Trinidad Guppy always has a black border around its tail, so that is what you may have. The value depends on the demand from the general public. The fascinating part of Guppy breeding is that you are very often surprised what variety in color and shape the Guppy will show.

Salts From The Seven Seas



By Alfred A. Schultz

Caught in the Net . . . A three-page letter from Bill and Katherine Jue of Mei Lan's aquarium reads like a movie travelogue. They have just completed a trip to the Far East. In their travels they have visited Japan, Hong Kong, Hawaii, Bangkok, and Manila. It is this last port that interests us most of all, because Bill Jue has set up in Manila a collecting station for marine fishes. With the help of ten natives whom he has hired and trained to collect fishes and set up a conditioning plant, he will soon be importing salt water fishes into the U.S.

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At this writing, he has already sent me a pricelist of fishes he has for sale. This list includes fishes of the Clown family, Dascyllus, Blue Devils, Demoselles, Butterflys, and Lion fishes. Some of the rarer varieties are also listed. If you are interested, write directly to Mei Lan, 6625 Foothill Blvd. Oakland, California. Please do not write to T.F.H.

It is with a heavy heart that I wish to report the passing of a friend. About seven years ago, Lumbini's Aquarium in Ceylon sent us some marine fishes to exhibit at a trade show. These fishes ended up in one of my aquariums after the show. Among these fishes was a *Hemichatus acuminatus*. This fish flourished and

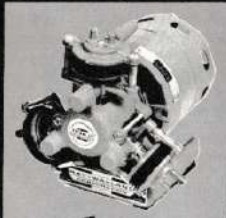
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grew through these seven years. At the time of his passing he had grown to about eight inches in size and had become tame. I could put my hands into the tank and he would swim over to get his sides scratched. One day without any warning I found him on his side at the bottom of the tank. I took him out and tried every method I knew to help him recover. My efforts were to no avail. Three days after I put him into the hospital tank, he was dead. Father Time had taken his toll. There is still one fish alive from the above group. It is a Tomato

Clown fish (*Amphiprion frenatus*). This fish did not gain as much size as did the *Hemiodus* and did not become as tame. By the way, who says that salt water fishes cannot be kept alive for any length of time?

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Meet the Hobbyists—Mr. and Mrs. Leon Fitch

BY FRED HOWARD

Photos by the Author

Have you ever met a hobbyist who was 100% successful?

Well, I've never met one single person who has claimed that he was always successful. But I know of two people (a husband and wife team) who might well be called extremely successful hobbyists.

They are Mr. and Mrs. Leon Fitch of 6605 Dupont Street, Flint, Michigan. For years now they've been keeping tropical fish and showing others how to enjoy them; they've been breeding, raising, and selling fish direct from their clean and sparklingly clear tanks. But I think

that one of the things they most enjoy is talking about their hobby and thereby educating others to the finer points.

When my wife and I visited the Fitches to interview them for this article, Leon and his wife Barbara made us sit down in their living room. My wife and I had seen their tanks—all located in their basement—many times before, and Barbara explained that we just had to sit in her lovely living room for just a little while, because they never use it when company comes. Visitors al-

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Mr. and Mrs. Leon Fitch relax in the livingroom of their home in Flint, Michigan. Starting out in the hobby as many other couples do, at the promptings of their children, the Fitches have become an expert aquarium team.



The Mottled Catfish, tentatively identified as *Corydoras undulatus*. Photo by Harold Schultz.

The Mottled Catfish

BY DR. A. VIGGO W. SCHULTZ
Porto Alegre, Brazil

"Oh, no! Not that many darn *Corydoras* again . . ." is the usual groan around the creeks and swamps here in Porto Alegre, when aquarists go fishing and bring up a quantity of *Corydoras paleatus*. And the complaint is justified. For one thing, they prick one's fingers when taking them out of the net, and they also may harm the more desirable fishes one is after, when hopping around in the net after having been pulled up from the water.

But this time I was not thinking of any of these disadvantages. We had gone fishing once more, some fellow aquarists and I, and my special aim was to catch a whole lot of *Corydoras*, the more the better.

The reason is easily explained . . . It so happened that lately I had been noticing a *Corydoras* which showed colors basically the same as those of *C. paleatus*, but of a different design.

When one is out after a certain species, something extraordinary usually happens. You look for the species you're after at your usual collecting grounds but find only a few specimens mingled among the other fish that live in that habitat. Generally you come to the conclusion that this kind of fish is rare. Then suddenly some nice day you find the real mother lode, a place where just that species abounds, nearly to the exclusion of everything

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ways go directly downstairs, where the earnest conversations about fish start almost immediately. Barbara had promised herself that sometime she was going to use the living room, and now was the time.

But, of course, we talked on and on about fish, anyway.

The Fitches take care of their hobby in a team fashion. Leon is a machine repair mechanic at a local Buick plant, and he takes care of the mechanical side of the hobby. Barbara is the true hobbyist, with knowledge that I wish I had about the breeding habits of fish.

When asked how they got into the hobby, Barbara said that years ago her eldest son—the Fitches have three children, two boys and a girl—had brought home a "wild" fish from one of the local lakes. As it was being fed, it would almost jump out of the water to get at the food. One day, the youngest child took the cover off the tank, which was on a bureau. The fish thought it was about to be fed and leaped up. In fact, Barbara said, it leaped so high that it jumped out of the tank and landed in an open drawer of the bureau. The child was so surprised that he slammed the drawer shut and ran out of the room, and that was the end of their first "collection"—and the start of their modern, excellent private hatchery. For they then, to pacify the children, went to a pet shop and bought a few Guppies, became interested, and are now a one-hobby family.

They don't do things halfway. When asked how they prepared themselves for the hobby, their answers were very enlightening.

And their answers could provide a tip for the beginning hobbyists who are thinking seriously of going into the hobby in a big way. The first thing they did was to read practically every book on fishes in the public library. They then mapped out strategy for securing certain fishes (easy-to-breed fishes first, then the difficult ones), tanks (first 10-gallon tanks for learning and experimenting with, then 15- and 20-gallon tanks, etc.), and equipment.

Meanwhile, to learn more about the hobby, Mrs. Fitch obtained a job in a local pet shop. She says that there is no better way to learn quickly about the trade, fish ailments, etc.

They acquired a personal library on fish. They bought a microscope in order to identify parasites and diseases.

They subscribed to magazines. They set up a cabinet area for cultures of live organisms such as microworms, white worms, and brine shrimp. They stocked a medicine cabinet with fish medications.

But the most important thing the Fitches did was to find an experienced hobbyist who would help them with the many small decisions and problems. They recommend that beginners scout around to find helpful, experienced hobbyists.

I asked Barbara what her favorite fish is, and it was difficult for her to answer. Mrs. Fitch said that she has spawned many different and difficult species, but she keeps coming back to Bettas and trying to obtain special colors. To do so, she says, has been most challenging. But, over the years, she has concentrated first on

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Young Mike Fitch beams as sister Cathy feeds Guppies in one of the family's 23-gallon tanks.

one fish and then on another, having success each time. When things start to get "easy" for her and her husband, she tries to breed another fish. Right now she has just purchased the eggs of two different kinds of Killifish. She ordinarily keeps 15 big Angels for breeding purposes. I counted 14 tanks that were given over entirely to Angels. She estimated that at the present time she must have 4,000 to 5,000 Angels in all stages of development.

Her breeding methods, with Angels are a little different from what I've used in the past. She uses trios! When things go well, one male will spawn with a female, and then in four to six days he will spawn with the other. She says that she has two sets of trios that will do this.

They both recommended the hardy and easily spawned Three-Spot Gourami (*Trichogaster trichopterus*) for beginning breeders.

The three children kept interrupting to tell me of certain habits and other characteristics of fishes, and I could not help but note how knowledgeable they were on the subject. Barbara said, though that as far as the fishes were concerned, the children had one main duty to perform—to stay away from the breeding tanks! But she mentioned that Mike, Steve, and Cathy each had a Betta to feed and care for. And the youngsters often were allowed to feed the Guppies in their 23-gallon tank.

The Fitches' hobby has recently occasioned a wide range of related activities. For instance, in the last few months they have helped about a dozen youngsters get started in the hobby. They hope that eventually these young enthusiasts will make good Flint Aquarist Club members. The Fitches themselves are members

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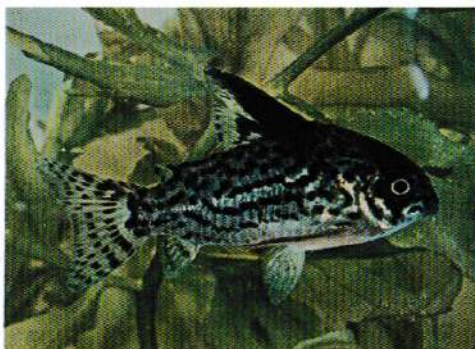
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else. I have made this observation with many nice aquarium dwellers that are found here in Rio Grande do Sul, the southernmost state of Brazil. And I have reports on other regions, from people who have been there, who state exactly the same.

The new *Corydoras* I was after had finally been located in a creek

temperatures. The bottom is sandy, with the banks full of semi-aquatic plants and plenty of floating ones on the surface. The place where the fish abound is from two to five feet deep.

The Mottled *Corydoras* is quite similar to *C. paleatus* in color, with a golden-brownish base, over which a darker reticulated design extends.



An unidentified Catfish with a pattern somewhat similar to that of the Mottled Catfish, but with striking black markings around the area of the head and on the dorsal fin. Photo by Dr. Herbert E. Axelrod.

about twenty miles south of Porto Alegre, my home town. This was—and still is—the spot where one catches many of them. So there we were, busily seining and catching fish.

The creek itself contains soft water, slightly acid, at sub-tropical

temperatures. It seems to be a little bit shorter in body and plumper of shape.

But it has a distinct advantage over *C. paleatus* in that it does not root as much as its cousin and does not stay as much on the bottom. This very moment, while I am writing this short report on it, I can see

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some of the Mottled Corydoras swimming around in one of my Guppy tanks, and they are very lively fellows, following the surface of the glass pane up and down. Besides this, they also like to rest high up on broad plant leaves, where they sit like birds perched on a tree.

Even *C. palcatus*, a few specimens of which I always keep to police the bottom of the aquarium for food leftovers, seem to be infected with the new *Corydoras*' liveliness, and follow the little schools of my new pets on their swimming excursions in the middle and upper reaches of the water, instead of sitting on the

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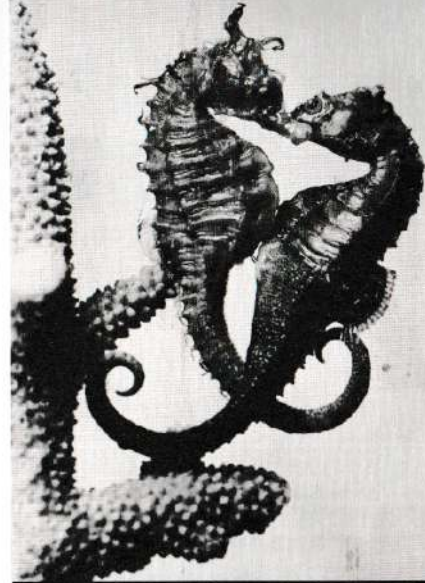
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An *Otocinclus* species. Various *Otocinclus* are found in the home waters of the Mottled Catfish. Photo by Harold Schultz.

bottom as they usually do when they are the only *Corydoras* in a tank.

So far I have nothing to report on how the Mottled *Corydoras* (a makeshift name, used as long as I am unable to find out the scientific one) is sexed, or how it reproduces. Probably the process is similar to that of *C. palcatus*, which they resemble so much that I probably

have had them often in my tanks without paying them any special notice.

But they are a beautiful and interesting addition to my community tanks with Guppies, *Otocinclus*, one large Sucker Catfish (about 12 inches long) which helps me to keep down the growth of algae in a most efficient manner, and some *Cheirodon axelrodi*.

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of the club: Barbara has lectured on how to raise live foods, and Leon is on the Program Committee, of which I am a member. He has helped to plan, in advance, all nine of our yearly meetings, our extra activities, and our contests. But their contributions to the hobby do not stop here. Leon, for instance, has just been interviewed over a local radio station on the subject of how beginners can get started, and he is planning a return interview to push for something that is quite dear to his heart—more members for the Flint Aquarist Club.

In short, the Fitches raise fine, healthy fishes—in quantity. They have standing orders from pet shops

for all the fishes they can produce, and they have built up quite a reputation for themselves as always supplying fishes that are in fine condition—disease and parasite free. Needless to say, what remuneration they get from their hobby somehow always manages to get plowed back into it.

Leon often passes out printed literature he has written on the care and feeding of the fishes he sells. He says the biggest variable in raising fish is people! If people know how to treat their fishes, they respond nicely. He hopes that this added service of providing information to beginners will help them get started in what he and his wife have found to be a totally engrossing hobby.



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