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NEW FISH STAMPS

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cover
In the past, several countries have featured tropical fishes on their stamps. Rarely, however, have the stamps depicted the fishes that they represented as accurately as do the new stamps from East Germany that are featured on our cover this month. It is a pleasure to give recognition to such a fine effort for such valuable publicity for the hobby benefits all aquarists indirectly and cannot be bought at any price. We are indebted to Dr. Friedrich Knerr, who sent us the stamps from which our photo was made. Dr. Knerr also wrote the article on these stamps that appears in this issue. We're sure you will find it of interest. It begins on page 16.

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president's note

It is my sad duty to inform the readers of TFH that William Vorderwinkler, our publisher, has been taken very seriously ill. Just when he will be back with us is rather uncertain at this time. We know that you will miss his authoritative yet warm and friendly contributions that appeared regularly on this page and elsewhere in the magazine.

Mike Reed (your editor) and I will be filling in for Bill on this page until he is with us again. In his typical conscientious way, Bill was well ahead on his extremely popular "Mail Call" column, so we will continue to run this feature in the hope that Bill will be back before it is necessary to get someone to fill in for him temporarily in answering your questions.

Those of you who want to send Bill cards should send them here, and we'll see that he gets them. I'm sure he will appreciate your good wishes.

Herbert R. Axelrod

Bleeding Heart Topsail Platy

A perfect example of how a knowledge of fish genetics can help the breeder achieve exactly what he desires

BY DR. JOANNE NORTON

Bleeding heart platies are not rare, but they are not as easily obtained from aquarium shops as are many other colors of platies. Top quality bleeding heart platies have beautiful bright red markings on a white background. The males vary in that some have red body markings as well as red in the dorsal fin, while other males have red on just the body or the only in the dorsal. Females have a white body without red markings, although some may have pale-red color in the dorsal fin.

In this new bleeding heart topsail platy strain, both males and females have a large dorsal fin. In addition, females as well as males may have red body markings. To develop a strain in which some of the females have this

The color of this young female bleeding heart topsail platy has faded somewhat due to her fear from being moved to a photographic tank. Photo by Dr. Joanne Norton.



A male bleeding heart topsail platy in full color. Photo by Dr. Joanne Norton.

red body pattern, it is helpful to understand why, until now, males but not females had this color. The reason for this is that the gene causing bleeding heart body color (called the "ruby-throat" gene) is on the Y chromosome, which was present in males only, the males having one X and one Y chromosome in their genetic makeup. A female of these previous bleeding heart strains had no Y chromosome, and, therefore, no ruby-throat gene, but instead had an XX genetic makeup.

I knew that a possible way to get a female with the bleeding heart pattern was to make a cross from which there would be produced a type of female having a Y chromosome carrying the ruby-throat gene. In some strains of platies the males are YY, the females WY. As a result of crossing platy strains and inbreeding the progeny, I already had a strain of gold crescent topsail platies that I thought included females having various sex chromosome combinations such as XX, WW, WX and WY. I selected several virgin females of these gold crescent topsails, hoping that at least one of them would carry the W chromosome. The first mating of a gold crescent topsail female with a bleeding heart (not topsail) male produced only a few females, all of

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which were gold, some with and others without a crescent, but none with the bleeding heart pattern. There were three topsail females. These females from the first cross were put with a bleeding heart male. Among the offspring from these females were some bleeding heart topsail males and also some topsail females with bleeding heart body color.

The bleeding heart pattern (ruby-throat) may appear as a few vertical red stripes, or, on some males, it may cover much of the body with red. Bleeding heart females have vertical red stripes on their sides. None are boldly colored with red. The ruby-throat gene is a dominant, called **Rt**. The recessive, **rt**, produces no red body markings. The dominant gene for red dorsal (**Dr**) is an allele (appears on the same location on one of two corresponding chromosomes) of **Rt**. Because of this, most individuals having both of these dominant genes got one from each parent. Only as an exception can both dominant genes come from the same parent. Therefore, to get males with both red body markings and red dorsals, you should select parents in which at least one of them has the **Rt** gene, causing that parent to have a red pattern on its body. Then the other parent should be one that has the **Dr** gene, causing it to have a red dorsal. The best type of male for breeding is one that has both red dorsal and red body markings, which is the color of a male with both **Rt** and **Dr** genes. Most females have only one of these dominant genes, so they have either red dorsals or red on their bodies, but not both. Either of these types of females may be mated to a male having both dominant genes. From a cross of a **DrRt** male (red dorsal and red on body) with an **Rt** (red on body) female, you would expect to get equal numbers of each of these four types of offspring: ruby-throat (red on body) female with clear dorsal, red dorsal female with no red on body, ruby-throat male with clear dorsal, and ruby-throat male with red dorsal. From a cross of a **DrRt** male with a red dorsal female, the results depend on the genetic makeup of the female, which might be **X(Dr)X(Dr)**, **X(Dr)X(dr)**, or **WX(Dr)**. The **X(Dr)X(Dr)** female should produce equal numbers of red dorsal females and **DrRt** (red dorsal, red on body) males. The **X(Dr)X(dr)** female would be expected to produce progeny in the ratio of 2 red dorsal females (with no red on the body), 1 ruby-throat male with clear dorsal, and 1 ruby-throat male with red dorsal. The **WX(Dr)** female would produce 3 females for each one male, the ratio being 2 red dorsal females, 1 ruby-throat female, and 1 **DrRt** (red dorsal, red on body) male. Considering these variable results from red dorsal females, I think that it is preferable to use ruby-throat females for breeding. A ruby-throat female should be mated to a **DrRt** (red dorsal, ruby-throat) male. Then from the offspring of this pair you should keep ruby-throat virgin females to cross with **DrRt** males, thus repeating the same type of cross.

Some of the bleeding heart topsails were gold rather than white. The

dominant gene for gold had come from the gold crescent topsail female that I had used. This gold color is easily eliminated by selecting breeders with white background color, which is recessive to gold. White-background bleeding hearts are true breeding for white body color.

Since there are two dominant genes responsible for red color in bleeding heart platies, there are a number of possible color types. The red body



In 1965 the news in platies was those fishes pictured on this page and the next. If you have been reading TFH long enough you'll remember the stories we did on them in the May and June issues of that year. Above, bleeding heart wags. Photo by Dr. Herbert K. Axelrod. Right-top, black variatus topsail platies. Right-bottom, red wag topsail platies. Photos by Dr. Jousse Norton.

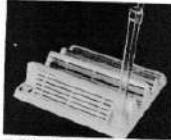
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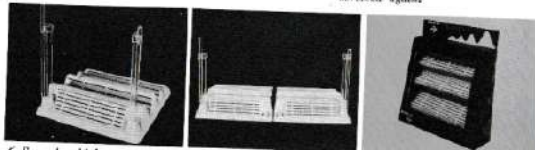
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pattern (ruby-throat), due to the **Rt** gene on the **Y** chromosome, may occur with or without the red dorsal, due to the **Dr** gene on the **X** chromosome.

The following types of **XY** males are possible:

- X(Dr)Y(Rt)**—red dorsal, ruby-throat.
- X(dr)Y(Rt)**—ruby-throat, clear dorsal.
- X(Dr)Y(rt)**—red dorsal, no red on body.
- X(dr)Y(rt)**—no red on body or dorsal.

The following types of females may occur:

- WY(Rt)**—ruby-throat, clear dorsal.
- WY(rt)**—no red on body or dorsal.
- WW**—no red on body or dorsal.
- X(Dr)X(Dr)**—red dorsal, no red on body.
- X(Dr)X(dr)**—red dorsal, no red on body.
- X(dr)X(dr)**—no red on body or dorsal.
- WX(Dr)**—red dorsal, no red on body.
- WX(dr)**—no red on body or dorsal.

The above genetic combinations could have been produced by the several kinds of parents that existed in my earlier bleeding heart topsails. However, by now selecting for breeders only ruby-throat females and **DrRt** males (having both red dorsal and red on the body), it is possible to decrease the number of genetic types, thus simplifying the genetics of bleeding heart topsails. This also makes it possible to keep the strain generation after generation and eliminate matings that can result in all-male progeny (if the male parent is **YY**) or a higher percentage of one sex than the other. This cross of a ruby-throat female with a **DrRt** male can be diagrammed as follows:

WY(Rt) female	×	X(Dr)Y(Rt) male
WX(Dr) —red dorsal female, white body.		
X(Dr)Y(Rt) —ruby-throat male with red dorsal.		
WY(Rt) —ruby-throat female, clear dorsal.		
Y(Rt)Y(Rt) —ruby-throat male, clear dorsal.		

This type of mating should be repeated, using only ruby-throat females and **DrRt** (red dorsal, ruby-throat) males.

Bleeding heart males may have one or both red patterns due to the genes **Rt** and **Dr**. However, if you look at the possible female types listed earlier, you can see that a female may have one of these red patterns, but not both.

Continued on Page 27

All for *Bulla gouldiana*

BY DORIS WHITNEY

Enclosing San Diego's South Bay is a narrow strip of land, hardly more than a causeway. Fed up and frustrated with trying to pick up shells between waves at Silver Strand Beach, I crossed over to the bay side of the highway. The dunes were quite high, with a railroad track running along in front of them. The sand was fine and hot with red and green vegetation here and there. I climbed to the top and saw the bay some distance across a strange wild landscape.

Down on the other side, the various ice plants and dry yellowish grasses were growing closer together, and though they were not very tall, I tried to walk in the car ruts that led more or less toward the water. I didn't like stepping on those spooky, springy, lively plants. The red ones I had never seen before. They had a few delicate white blossoms that were similar to dandelion puff balls.

When the path finally ended abruptly, I stood looking for a likely opening in which to plant my next step, and a jackrabbit went leaping from clump

Bulla gouldiana in perfect condition is quite a find for a shell collector.
 Photo by Doris Whitney.



Bulla gouldiana, with four *Chione* *fortifraga* and two small dark pointed *Cerithidea californica* (*Californica* horns). Photo by Doris Whitney.

to clump and out of sight in an instant. Near the water, a few beautiful little black and white birds were circling and shrieking. Small dark ducks were floating near the shore. Marsh grass a foot or so high lined the edge of the mud beach. It was firm enough to walk on but soft enough for a large colony of shells to rest on comfortably. I picked up several of the most common type chiones and some black augers that were nicely camouflaged in the dark mud and moving slowly around bits of trash.

The whole area was pretty littered with junk, but farther along a sort of neat looking sandy point jutted out. I started in that direction in my rubber thong sandals, picking my way carefully among jagged bits of broken glass. It turned out that I had to walk a couple of hundred yards solid of glass fragments. One mustard jar was completely bent and flattened, and I thought, good grief, maybe this is atomic waste! I noticed that most of the glass was too burnt to have been burned by the sun. One whole heavy coffee cup was marked USN, and many of the bottles and pieces were either whiskey or aftershave lotion.

More of the beautiful black and white birds with long thin tails like white

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pickle forks were swooping and cawing and carrying on, and I thought, I must be near their nests, and they're trying to distract me from the eggs. My word, eggs; there is one now, but it's broken.

It was no egg; it was the biggest bubble shell I'd ever seen and perfect, and fragile. . . *Bulla gouldiana*? I wrapped it in a paper napkin and stuffed it in my straw mat pack. I'll shoot myself if it breaks before I get out of this mess.

About then the glass was left behind, but the mud was getting softer and oozier and sucking my sandals down at every step. I started inland where some patches of ground between the tall grass looked solid. But they weren't. One of my feet sank beneath the sulfur-smelling muck, and the sandal strap snapped in the tugging. I had to retrieve it with my hand, which came up thickly coated with black slime. The smell of sewer was pretty evident, and sure enough three large ducts were protruding from a higher bank not far ahead. I edged back nearer the water, walking on tiptoe so my sandals wouldn't get sucked in. It finally got so wet that I had to walk on top of the grass, bending it down step by step.

Several times I thought I had found a solid path inland, but then I had to brace myself for retreat after my foot began sinking. Once I picked up a giant cockle covered with a smooth pattern of green mold and rusty mud thinking, this is no doubt contaminated, but I was unable to resist an addition to my collection. Just about that time, another jackrabbit sprang up nearly close enough to touch and lit out for the high ground.

After a tiring nerve-wracking march through absolute desolation where my greatest horror was the thought of having to turn back, I sighted up ahead several groups of men with trucks and large smoking piles of debris; the city dump. My footing was not at all improved, but it wasn't far to an embankment made entirely of trash with a few slabs of broken concrete and a rough prickly brambly shrub. I climbed cautiously over the precariously balanced rocks because each see-saw step might land me in the bushes where a scratch of my skin would call for a tetanus or at least a typhoid shot. I had mud over both feet, one hand, and splashed halfway up my legs.

A last effort put me up on solid ground. There were several truck paths leading to the high dunes of clean sand, around and through the huge trash piles. As I got closer, familiar shapes appeared; a wicker chair on its side (one leg missing), a very old model refrigerator (the door hanging open), hangers, boxes, and trunks. There was a small building with a sheet-metal fence enclosing it. This was the office and I wondered, does he live there, the man who runs the dump, and is there any running water?

The third and last jackrabbit of the day came tearing out from behind the shack and up over the dune. I followed him slowly, rubbing the hot sand over my muddy feet, till I saw the highway across the railroad track. I was out safe with my treasure.

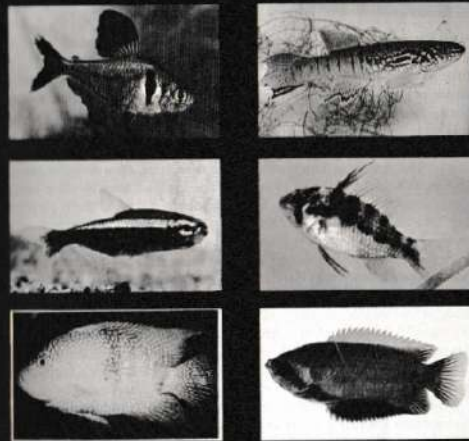


The color photos shown above are reproductions (enlarged 20%) of stamps recently issued

Aquarium Fishes on

In early November, 1966 there appeared six special stamp issues in East Germany which pictured aquarium fishes and should be of interest not only to stamp collectors, but also to aquarium hobbyists. Many foreign aquarists will surely want to know about these stamp issues.

The lowest value represented in this colorful series is a 5-pfennig stamp which represents *Megalomphodus megalopterus*. This Brazilian fish belongs to the tetra family. The tetra family is huge, its members coming in many shapes and sizes. Only one thing can be said of the tetra family in general: they have no barbels. Many species have a more or less well-developed



in East Germany. The black and white photos are live shots of the fishes shown on the stamps.

East German Stamps

BY DR. FRIEDRICH KNORR
BERLIN-FRIEDRICHSHAGEN
GERMANY

adipose fin. This fin is a flap of skin which appears at various distances between the dorsal fin and the tail.

Megalomphodus megalopterus roughly resembles a flame tetra, but the male's dorsal and anal fins get to be exceptionally large. Surely this fact was responsible for getting the fish named, because *megalopterus* means "large-finned". Sterba even mentions "a flag-like dorsal fin" in his description.

According to Hans Frey, a fish's colors depend to a great extent upon its living conditions. Male specimens of this species are dark gray in color in captivity, while the females have a reddish glow. Characteristic is a deep

black shoulder spot above the base of the pectoral fins, surrounded by a shining halo. While some fishes react to any excitement by changing the color of their entire body, Frey tells us that the only reaction to excitement shown by this species is that the dark gray fins of the males become a deep black. Sterba, on the other hand, makes the same observation, but he attributes the change to the females.

The cardinal tetra, *Chirodon axelrodi* is pictured on the 10-pfennig stamp. This species is very similar to the neon tetra, *Paracheirodon innesi*. Its length is given as 1½ to 1¾ inches. The cardinal tetra is still a fairly recent introduction to aquarists, having first been described about 10 years ago. Because our knowledge of this fish is still fresh, we do not know very much about its habitat. It is known, however, that the first imports came from the Rio Negro, a tributary that flows into the Amazon River. Since this tributary is more than 600 miles long, it naturally flows through a large territory. There is probably a great difference between the waters at its head, in the middle reaches, and at its mouth. In the scientific literature dealing with the cardinal tetra, there was a good deal of confusion at first: almost simultaneously, the fish was named *Hypsesobrycon cardinalis* and *Chirodon axelrodi*, and it took a decision by the International Commission on Zoological Nomenclature to confirm the name *Chirodon axelrodi*.

Next in value is the 15-pfennig stamp with the Texas cichlid, *Cichlasoma cyanoguttatum*, which is native to the state of Texas and the northern part of Mexico. In the wild state they reach about a foot long, while those raised in captivity seldom exceed 6 inches.

Cichlids are usually quarrelsome fishes which do not confine their battles to other species, but also attack their own kind. In the aquarium, certainly in the wild state as well, they take possession of a certain territory and defend it from all intruders. The bigger the tank, the less chances there are of overlapping territories and the more peaceful the fish are likely to be.

While spawning, *C. cyanoguttatum* digs up the bottom vigorously, up-

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rooting and damaging some of the plants. It is advantageous that Texas cichlids can withstand lower temperatures and suffer no damage if the water drops to 57° F. for a short time, but breeders report that in such cases the parents frequently eat their eggs or fry.

There is a certain amount of confusion concerning the scientific name of the Texas cichlid. In his work *DICTIONARY OF TROPICAL FISHES*, Frey names this fish *Herichthys cyanoguttatus*, and other authors name it *Cichlasoma cyanoguttatum*, but the stamp calls it *Cichlasoma cyanoguttatum*.*

The 20-pfennig stamp shows the blue gularis, *Aphyosemion coeruleum*, from Africa. The fish is found in lakes, streams, and ponds where there is a light current. With a size of close to 5 inches it is one of the relatively large aquarium fishes. Keeping it is not exactly simple, because it cannot be put in a tank where there are smaller fishes since it feeds without mercy on small species about the size of a guppy. Males are also said to battle among themselves, but these are supposed to be empty threats and the fish is reputed to be relatively peaceful. Sterba differs from many other authors in the spelling of the scientific name: he uses *Aphyosemion caeruleum*, while the stamp and other books use *A. coeruleum*.

Like a large beautiful butterfly *Microgeophagus ramirezi* flutters through the tank, and it was chosen for the 25-pfennig stamp. It is native to South America, coming from the western tributaries of the Orinoco, the Rio Apurè, and the Rio Meta, in Venezuela. Recent literature tells us that the generic name was mistakenly applied to this fish as *Apistogramma* and that there has been a new genus, *Microgeophagus*, suggested for this fish. The stamp bears out this new identification and calls it *Microgeophagus ramirezi*.

The observation made by many breeders that the elongated first rays of the dorsal fin are a sure indication of males in this species is incorrect. These elongations are almost always absent in the females, but are not invariably present in males.

The main attraction of the issue is a 40-pfennig stamp which shows *Cotisa chuna*, the honey gourami. The fish is one of the labyrinth fishes. The second ray of its ventral fins is elongated to very long, threadlike structures. These threads carry taste and sensory cells.

Cotisa chuna is native to India and Pakistan. The adult length is given as up to 2½ inches. Accounts have been given of pairs of fish half this size spawning. Males and females are colored very much the same except at spawning time. Then the male becomes golden yellow to salmon pink with a dark blue area extending from the mouth to the center of the belly.

*At T.F.H. Publications, we have always preferred to use *Herichthys cyanoguttatus* as the scientific name for the Texas cichlid. There is, however, a strong move afoot, particularly in Europe, to use *Cichlasoma cyanoguttatum*, and this stamp may go a long way toward furthering the cause.



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Continued from Page 11

I have found only one exception among the hundreds of bleeding heart topsails that I have observed. This exception, in which a female has red body markings as well as a red dorsal, can be explained on the basis of a rare occurrence known as "chromosome crossover" (which is known to occur occasionally in platies) or some type of chromosome irregularity.

Myron Gordon, in his booklet *PLATIES AS PETS*, wrote: "One problem remains for the keen breeder of aquarium fish. The Bleeding-heart character has not as yet been developed in the female platyfish—only the male has the brilliant red coloring. But I am confident that soon the female will be as colorful as the male; such developments are not without precedent." The bleeding heart topsail platy strain is the first that I know of in which some of the females have the bleeding heart pattern. The ruby-throat pattern in females is not as brilliant as in males, perhaps because of hormone differences. This could be tested, as is done with female guppies, by adding methyl testosterone (a male hormone) to the water to see if this will cause the females to become more colorful. Even if the paler ruby-throat marking in females is due to a hormone difference, this does not mean that the color intensity of the bleeding heart pattern in females can not be improved. There are gene modifiers known that enhance the effect of other platy genes. For example, modifiers can affect the intensity of red color (this red color being due to a dominant gene, **R**), and other gene modifiers influence the degree of spread of the red dorsal (Dr) color onto the body. It is possible that in other strains of platies or swordtails there may exist one or more gene modifiers that can enhance the effect of the ruby-throat gene. At present we do not know if there are any such modifiers. Although there has been no evidence that any ruby-throat modifiers (having appreciable effect on the ruby-throat pattern in females) exist in the present bleeding heart topsail platy strain, it is possible that such a gene or genes may exist somewhere in fish of another strain. These genes would go unnoticed if the ruby-throat is not also present.

Bleeding heart topsail platies, like other hi-fin platies and swordtails, do not breed true for the large dorsal character, although they produce a good proportion of topsail offspring. Two things have been accomplished in development of the bleeding heart topsails. First, the dominant gene, **H**, for hi-fin dorsal has been added to bleeding heart platies. Second, females with **WY** sex chromosomes have been produced, these females having bleeding heart body markings because they have the dominant gene for ruby-throat (**Rt**) on the **Y** chromosome. Females of previous bleeding heart strains had **XX** sex chromosomes and, therefore, did not have the ruby-throat pattern.

27



The Latest Miracle In Heaters

BY DR. HERBERT R. AXELROD

In the modern revolution that is bringing tropical fishkeeping from the dark ages up to the edge of modern science, it was only a matter of time before we could produce a better aquarium heater.

Undergravel filtration alone was probably responsible for more new hobbyists than any other single invention. Miracle Filters, the original undergravel filters, sold millions during the early 1950's. It was the first time a new hobbyist could keep his tank absolutely clear without changing water and without the necessity of messy glass-wool and charcoal in bulky filters hanging on their tanks (though these filters are necessary under certain circumstances.)

Now another "miracle" has been introduced to the aquarium scene . . . *the unbreakable heater!* This heater is similar in appearance to the regular aquarium heater except it is more highly tapered and has a thicker tube to give the heater a greater heat-generating surface. The

Photo courtesy Miracle Plastics Corp.

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tube is molded into the base of the heater head so there can't be any water condensation through this area. In glass tube heaters, the tube is slipped into a hole in the base of the head and is a constant source of water seepage. This water seepage creates steam when the heater is operating and the steam, in time, corrodes the points, causing heater failure and possibly cooked fish.

The advantage of the unbreakable heater is not only its *waterproof* characteristic. The tube is made of a space-age plastic which can withstand high temperatures and is so tough that if you throw it against the floor with all your might, it won't break. This is important because many heaters are damaged in shipment, and small cracks in the heater tube, often unseen by dealer and hobbyist alike, can cause a serious electrical situation in the aquarium.

Then, too, how often has a hobbyist decided to clean his tank, forgetting to disconnect the heater? As soon as the water is removed the heater turns on and if the unlucky hobbyist grasps the heater at this point, he will be severely burned. If he still ignores the heater and fills his tank with fresh water, the heater will crack or explode from the sudden cooling, and another dangerous electrical situation might occur.

Should the same thing happen with the new unsmashable heater, that is, should the hobbyist empty his tank and allow the heater to operate, he would notice a slight blistering and distortion of the heater tube. This would remind him immediately that something is obviously wrong and he certainly wouldn't grasp the heater (even if he did it would be considerably cooler than a glass tube under identical circumstances and he wouldn't seriously burn himself.) If he filled the tank with water while the heater was on and the tube was hot, nothing at all would happen except the plastic would be scorched . . . but not ruined . . . and safe from electrical dangers.

So, now you have a safer heater available to you. It won't break if you drop it on the floor . . . it can't burn you . . . it won't crack if you fill up the aquarium while the heater is on . . . it is accurate to 1°F . . . it is available in either a clear tube or a solid, opaque tube . . . it is completely automatic and thermostatically controlled . . . it is fully guaranteed . . . it has a larger heating surface than any other heater in its field . . . and it is another advancement in the technology of aquarium management that makes tropical fishkeeping safer and easier. Patents have been applied for.

31

Exploring for Freshwater Fishes in Kerala

BY RODNEY JONKLAAS
CEYLON

An assignment to collect fishes and train collectors for the Aquarium of the University of Kerala at Trivandrum, the capital of Trivandrum State in India, came my way early this year. This was something I looked forward to greatly, for when I first went to Trivandrum in 1965, an experimental dive to collect marines had opened my eyes to vast new possibilities in that part of India. There had been representatives of the University there at that time, and their eyes had been opened too.

My main job was to go for the exotic marines but, in between trips for marines, I contrived to squeeze in some hasty freshwater collecting expeditions which more than bore fruit. After the Kerala assignment, I was suddenly asked to do the same for the Taraporevala Aquarium in Bombay; so on a single trip, I covered a great deal of ground and saw very much more of India and her freshwater fauna and flora than I had expected to.

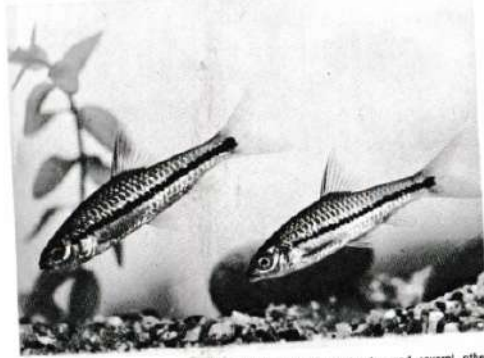
The prime mover in this was Sharad Sané who, in spite of being recently married and being neck deep in his business, flew down to rendezvous with me in Trivandrum. Sané, for the benefit of new readers of *TFH*, is the man responsible for bringing *Cotisa chana* to the aquarium world. You may be sure this will not be the only new attractive fish to reach Europe and the U.S.A. from Sané's little export business.

Anyway, one bright day Sané breezed in on an Indian Airlines friendship aircraft, amply loaded with plastic bags, rubber bands, weird preserved creatures in jars (he is a flourishing biological supply man) and other unusual materials. We lost no time in getting settled temporarily in Trivandrum in the same hotel, and within a few hours we were collecting marines.

About 2 weeks later, we decided to take time off from marine collecting and go up for the day to some hill streams. I needed a respite from the strenuous skindiving program I had indulged in (without breathing gear, I might add). I was happy to get into the little car belonging to Mr. Purushottaman Nair (another old friend of Sané's, who was being trained by me to collect for the Aquarium) and be driven inland for a change.

Trivandrum is in itself quite an interesting hunting ground for freshwater fishes. The paddy fields and the streams feeding them abound in *Anabas*, *Rasbora daniconius*, *Aplocheilichthys innotatus*, *Macropodus opercularis* and

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The paddy fields of Trivandrum abound with *Rasbora daniconius* and several other species. Photo by G. J. M. Timmerman.

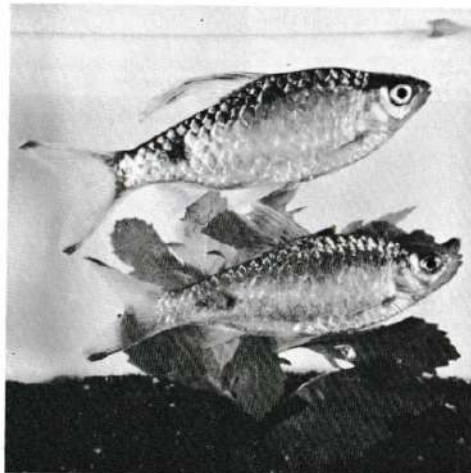
its rare sub species *dayi*, and others. We wasted little time in these areas and proceeded uphill to our destination some 40 miles away on the Shencottah road. We reached Tenmalai, a small town on a hillside, and in the small valley below flowed a clear, inviting stream. About 2 or 3 miles up the road, where there were no houses and an enormous stone and concrete railway bridge towered above us, we stopped to examine the same stream. The sky was gray and the air cool, but the surrounding forest was bone dry. This was a typical "rain-shadow" area, the North-East monsoon breezes merely passing over the hills and not providing rain on their western slopes.

We rushed down to the stream watched by some laborers who, as usual, considered us semi-lunatic, for tropical fish collectors are unknown in this part of India. I carried my face mask and a huge net I had designed for the purpose of herding in fishes, as I do in Ceylon. The water was cool and clear, and in seconds I found that the stream was teeming with *Puntius melanampyx*, a species of *Bariilus* which resembled *Danio malabaricus* in its movements and coloration, an attractive *Noemacheilus* which turned out to be the very common *N. guntae*, a very few *Lepidocephalus thermalis*, some *Rasbora daniconius* (to my great disgust this fish is so common that it is almost a pest in Ceylon and India), a pretty *Mastocembelus*, and an *Ophio-*

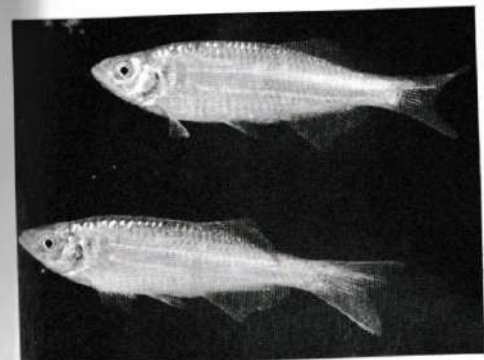
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cephalus which I couldn't catch. We were chiefly interested in *Capoeta melanampyx*, the ember barb, and my method of using a mask to watch them underwater and then to herd them in a wide net, was very successful and acclaimed by Sané and Nair. The rocky stream had useful little shallow blocked spots which attracted dozens of ember barbs which we could catch when we disturbed the rocks and boulders. Each sweep of the net yielded from two to twenty of these beauties, the males glowing pink in their mating colors. The *Bariilus* species were much harder to catch; they chose fast-moving water at the stream's edges. It was an event to net more than one at a time. The bulk of the catch was *Capoeta melanampyx*, and in less than an hour of fast, enthusiastic work we had over 200, to Sané's great delight. These were immediately carted uphill, photographed, and packed in plastic

Capoeta malabarica were found in the streams of the area.
Photo by Dr. Herbert E. Axelrad.

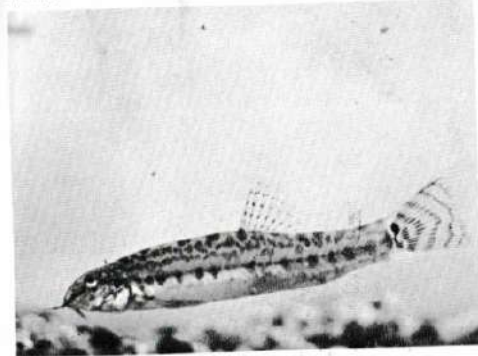


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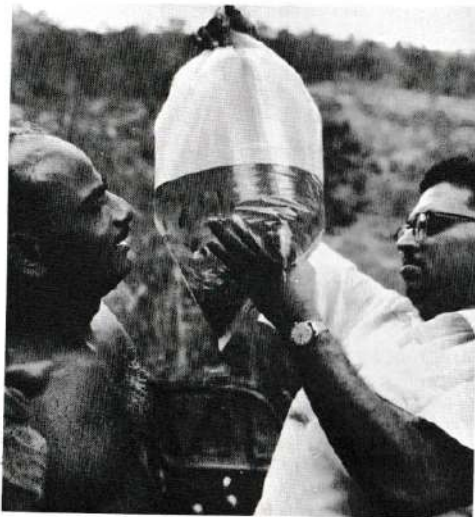


A species of *Bariilus* which resembled the giant danio, *Danio malabaricus* (above), was also found. Photo by Gunter Seiff.

Lepidocephalus thermalis were found in small numbers. Photo by G. J. M. Timmerman.



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Purushottaman Nair (left) and Sané examine a bagful of *Copeste melanampyx*.

bags with oxygen. We then turned back the way we had come, but not before Mr. Nair lost his car keys, which gave us several anxious minutes until he finally discovered them.

Some 15 miles down the road, we stopped at a stream we had passed on the way up. This was a larger, more rocky, and warmer looking spot and had its quota of ember bars too, as was to be expected. But more interesting to Sané, there were plants... very healthy *lagenandras* growing on the margin and red *fontinalis* growing profusely on the boulders in midstream. The fishes here were very hard to catch and had ample cover in the thick vegetation and among the boulders. But again, using the mask, some cunning, and two large nets I had devised, we got some specimens. Of great interest

were the half-grown *Copeste mahicola*, which sported very distinct red spots on their caudal extremities and also were quite vividly colored in gold and green on the dorsal surface with a rather sharp termination where the white belly began.

At another stream, much closer to Trivandrum, the same sort of fauna was evident, but with much fewer *melanampyx* which were also not as bright as their relatives from higher, cooler, clearer streams. It was evident that *melanampyx* is to Kerala what *Puntius nigrofasciatus* is to Ceylon. The cooler and clearer the water, the brighter the *melanampyx* and *nigrofasciatus* and the larger the concentrations of them. The *Burillus* here were very similar in movement to the *Danio malabaricus* of Ceylon.

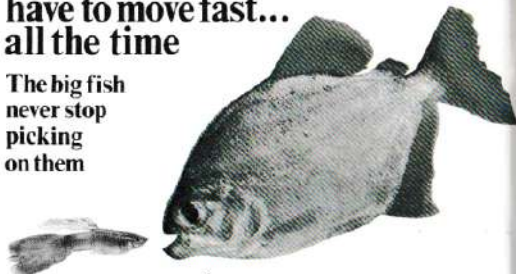
In spite of having got back to Trivandrum somewhat exhausted, I was

Oxygenating a bagful of fishes in rural India always attracts attention.



Little fish have to move fast... all the time

The big fish
never stop
picking
on them



TFH knows all about the problems of little fish, you see. So far we're only number 3 in the pet supply business. We'd be swallowed up if we didn't move fast. So we have to originate, invent, upgrade, innovate, gamble and work hard.

Of course, number 1 and number 2 copied our freeze-dried tropical fish foods, our undergravel filters, our pet books, our unique methods of distribution... and before the year is out they will have copied our heaters, pumps and a completely revolutionary new food we'll soon introduce. After all, they're on top because they know what's best... that's why they try to imitate our new products.

So, since we are only number 3, always have new products and innovations before our competitors, and spend our precious money on research at a rate about 20 times greater than number 1 and 2, please give us a break. We need the business... and the profit... so we can bring you even greater items to make your hobby more pleasurable.

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obliged to spend the early evening and night collecting marines at Vizhinham harbor; this, after all, was my real assignment, and I did not want the Aquarium tanks to be empty if I could help it.

The next morning, hideously early, we set out in Mr. Nair's gallant little car for Aqilon, some 40 miles away, where Sané and Nair spent several spirited hours discussing and drooling over a weird assortment of preserved creatures. Both these gentlemen are avid and successful suppliers of "Biological Specimens", a very wide term more or less implying that they knew a great deal about the little-known plants and animals that schools, colleges, and universities need by the hundreds all the time for the teaching of practical biology. Education in India, which has some 250 million people in her roll call, is quite a staggering chore, and biological supply houses are in constant turmoil to keep the specimens coming.

However, we somehow got packed in the car again and bumped our way down to the town of Kottayam, where we were able to obtain food in a place called Bestotel. To my intense disappointment I could not get fresh prawns or shrimps at any restaurant in Kerala, despite the fact that I saw thousands of pounds of fresh-caught ones being cleaned and sorted. They were, however, for export only. Bestotel was able to give me canned shrimp, the smallest I had ever eaten and not the tastiest either. We were able to obtain nice rooms in the Government Resthouse, where the ear-splitting strains of Indian, Western and other unknown forms of music blasted from a loudspeaker which faced in the general direction of our room. This, of course, promised a poor night's sleep, if any.

We hurriedly left for a spot that had been on Sané's schedule of places to go for many days... Mundakayam. Here, according to Day, the greatest ichthyologist to work in India and the East, a fabulous barb, *Puntius denisonii*, could be found. According to the picture and description in Day's "Fishes of India", which has now been reprinted, *P. denisonii* resembles *Rasbora vittata* but sports a bright red stripe from nose to tail. This, no doubt, would cause the blood pressure of any collector to rise.

Just out of Aqilon, we had stopped briefly at a little muddy stream where some people were engaged in fishing with baskets, lines, and small nets. This had seemed a likely spot, so we made a hurried examination of the area, helped by a little boy, and, sure enough, we got some specimens of the really beautiful *Labeo adiburjori*. Sané was so elated over this luck that he was quite sure we would find *Puntius denisonii* at Mundakayam.

We arrived well after 5:00 p.m. and immediately waded into a shallow, boulder-strewn stream where some 2 years ago Sané had collected, under monsoon conditions, many *melanampyx* and some unusual mandids. He said that since the stream had been so muddy and swollen, he could not see anything but asked a local net-throwing fisherman to try his luck, which he did, with fair results.



Below are two Karala fishermen with net and basket. The small boy is a voluntary helper. Above left the rascally old fisherman of Mundakayam and his helper sort fishes after a cast. Above we see the old fisherman make another cast as his helper strikes his most impressive pose for the camera.



The stream was now low but still not very clear; it seemed that all fishes living in it were quite terrified and fled at the very sight of a human being. From some distance we could see *melanampyx*, *mahicola*, and, to our great surprise, dozens of orange chromides, *Etiopis maculatus*, living in this pure fresh water, whereas the typical habitat of these fish in other parts of India and Ceylon is brackish water.

Close to the Mundakayam Planter's Club, we got in the water once again, and even though I spent a lot of time submerged and peering under rocks, weeds, and streamside bushes, I did not see a trace of the fish we were most after, *P. denisonii*. We did, however, uncover a very beautiful bright green cryptocoryne species growing both in and on the banks of the stream. The plants which grew above water but with their roots in moist sand and mud,



Sané collects plants along the edge of the water. He was most pleased with the number and quality of plants available.

Sané shows a specimen of *Legenandra lancifolia* (left) and a specimen of a new *Cryptocoryne* (right). The ruffled leaves of the new plant resemble those of *Aponogeton crispus* of Ceylon.



Sané proudly sorts out his collection of plants prior to leaving Mundakayam. This was a really fine haul.

August, 1967

looked so much like overgrown lawn grass that at first we ignored them. It was only when we saw the submerged plant with its gently spiraling leaves that we knew we had a new aquarium plant. There were also lots of common *Legenandra lancifolia* about, so when it grew darker and we set out back to Kottayam, Sané was not totally disappointed over the lack of *denisonii*.

We were back in the same area the next morning, after a sleepless night of listening to the deafening loudspeaker. It ceased at 7:00 a.m. sharp, just when we were setting out for Mundakayam, red-eyed and indignant.

The first person we sought in Mundakayam was the net fisherman Sané had worked with 2 years before. When we found him in his little hut, the first thing he demanded was 2 rupees, which Sané hastily forked over. The old rogue then got his net, squeezed into the car with us, and asked us to drive to the same stream we had waded in the evening before. He then demanded more money for tea and vanished into a small eating house while we disconsolately waded and floundered about in search of the elusive *denisonii*.

The old boy reappeared with a small boy as helper and immediately set about throwing his net at everything that moved. All fishes caught, which were mainly *Rasbora daniconius* and a few *Etiopis maculatus*, were promptly consigned by the man to a rusty old tin can. We decided that fresh fish for eating must certainly be scarce in this part of India. Of course, we got no *denisonii*, so we drove to another stream higher up and some miles away on a rubber estate. Here, the same ritual took place. Every time a *melanampyx* was caught Sané grabbed it with soothing and clicking sounds and placed it tenderly into a plastic bag. The other species ended up in the rusty tin can.

After a while, we drove back toward town and tried another stream where we got a few *Barilius*, more *melanampyx*, and many fine specimens of the new cryptocoryne. The old man had to be summoned from upstream where he was busily casting away at the poor *daniconius*. He demanded another tip, which was indignantly given him by Sané, and finally we left with the few fishes and plants we had collected. It was obvious that in the good old days of Day this area had been wild and forested, and no doubt *denisonii* had been collected in this stream which was then shadier, clearer, and also spared the attentions of the old fisherman. But now vast areas were deforested to make way for rubber estates, and the streams are polluted and deprived of their shade. Strong fishes like *Rasbora daniconius* have invaded the haunts of the prettier-but-more-delicate ones like *melanampyx* and *denisonii*. I have seen the same sort of thing in Ceylon where jungle streams teeming with black ruby barbs and *Rasbora waterfloris* (both of which are shade and clear water lovers) suffered from human interference.

We had no time to explore any more, so we set out for Kottayam. Here, we sought out another biological supply man who, like his fellows, lived in a weird atmosphere thick with the fumes of formaldehyde. Another com-

plicated discussion took place, and from Sané's bulging suitcase appeared odds and ends in plastic bags. Eapen, who ran the Kerala Biological Supply House of Kottayam, was the flying lizard specialist of India, and he proudly showed us several dead specimens in alcohol. A deal was made and before we left, Eapen gave us his unique price list, an extract of which I duplicate here for the entertainment of TFH readers.

SKELETONS

- 1. Rat \$2.00 each
- 2. Cat \$5.00 each
- 3. Rabbit \$7.50 each
- 4. Dog \$25.00 each
- 5. Human Being (Best quality) \$175.00 each

We spent a great deal of time discussing the various qualities of human skeletons on the way to a bus on which Sané left us for other parts of Kerala and thence to Bombay.

The State of Kerala certainly qualifies as the best in all India for collection of freshwater, brackish, and marine fishes and also freshwater plants. There are no organized collectors as in Ceylon, Malaysia, and South America, and our very brief exploration could hardly be expected to yield any really exciting results although it did: at least one nice new species of *Cryptocoryne*. Given time and money, a serious experimental exploration of Kerala should bring to light many more discoveries. In 1964 I was able to find *Monacrus trauancoricus* a beautiful freshwater puffer in a few hours. A writer on big game hunting describes collecting "bright red and blue small fishes" for his aquarium in tiger-infested jungles on the Kerala-Mysore border. The exact name of the village at this spot is given and some day I hope to go there and see just what this fish is.

Some day perhaps a serious collector will set up in Cochin or Trivandrum and fly his material to Bombay where the many international air lines can fly them to the west and eventually to the tanks of hobbyists the world over.

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New post office regulations make it essential that you include your zip code on all correspondence to TFH for which a reply is expected and on all subscription or book orders. Thank you.



Lepisosteus tristoechus, one of the many gars that are native to the United States. Photo by Klaus Payson.

I Like U.S. Fishes

BY DR. WOLFGANG KLAUSEWITZ
Frankfort, Germany

The Americans are a rather proud people. Their pride covers the longest bridges in the world, the highest buildings, the largest waterfalls, and the most beautiful natural parks. But they are . . . and this fact is not understandable for me as a foreigner . . . not proud of the fishes of their country. I cannot condone their attitude, as I find that many species in the rivers and lakes as well as the seas around the shores of the United States are really beautiful and exciting. But the specimens a U.S. aquarist likes to put into his tanks have to be imported from South America, Africa, Asia, Europe or other places in the world. Therefore, smart importers send ordinary killifishes from Florida to Germany, let the Germans breed them, then import them and sell them for a good price. As these fishes are no longer ordinary American ones, but imported specimens from abroad, they are now considered exciting and keepable in U.S. tanks! This I cannot understand!

I believe that the fish fauna of the United States has so many attractive and distinguished species that the American policy of neglecting native species should be changed. Perhaps a little help is necessary. Therefore I intend to write about some species which are really worthy of being acknowledged as good aquarium fishes.

Let's take a short look at the freshwater fishes. Are they really so dull and so stupid that they are justifiably spurned in their native land? To my mind the answer is "NO." As an example, look at the different species of sunfishes



"Well, you told me rain water is best!"

(Family Centrarchidae). They are very colorful and have many enthusiastic supporters all over the world. Why should the U.S. aquarist not like them too? Other very interesting fishes of the United States are the different darters of the genera *Ammocrypta*, *Percina*, and *Etheostoma*. Also, really wonderful are the various freshwater sculpins (Family Cottidae). Especially exciting is a school of young pikes (Family Esocidae); they will attack and eat one another until only one specimen is left.

I myself prefer the gars (Family Lepisosteidae). It is interesting to see the young ones in the creeks which flow parallel to the highways. When you make a trip to Florida you stop along the road, look down into the water, and see them swimming along the surface. You can observe how they catch little minnows, chubs, and killifishes. And if you like to catch fish, nothing is easier than to get a gar on your hook. This way you can bring home a new aquarium fish from your journey.

Of course you know there are gars living not only in Florida but also in many other places in the United States. Of the ten species of this family, five live in North America, the alligator gar of the Mississippi River, *Lepisosteus spatula*, with a rather broad and blunt crocodile-like snout; the shortnose gar, *L. platostomus*, of the Great Lakes and the Mississippi Valley, which has a more pointed snout; the spotted gar, *L. productus*, from Iowa and Nebraska down to the Gulf of Mexico, and the closely related Florida gar, *L. platyrhincus*; and, last the longnose gar, *L. ossicus*, with its greatly elongated snout, inhabiting the area from Minnesota east to Vermont and south to the Gulf of Mexico and the Rio Grande River. They all live in sluggish water, where they wait, pike-like, for their prey. They can live in stagnant water with a low amount of oxygen, as their swim bladders have a passage to the throat and are used like a lung allowing them to swallow atmospheric air.

The gars eat just about anything they can catch, including smaller specimens of their own kind. In captivity they easily learn to eat dead fish, but it is very exciting to feed them living specimens. The best way to start with gar is to catch (or buy) one or several young ones, some species grow and grow, and after some years you might encounter difficulties keeping them in even relatively large tanks. Their bodies are cylindrical, and their jaws are long and armed with rather large and heavy sharp teeth.

From the scientific standpoint the gars belong to a very important group. Their skeletons are more or less cartilaginous, only the head has large bony plates and shields. This is a primitive characteristic as is the possession of ganoid scales which are very different from those of the real bony fishes. From an evolutionary standpoint, they are very old fishes, with ancestors in the Cretaceous period. So if you have one in your tank, you can say you have a fish that is an ichthyological Methusalem, living and looking like a pike but as important, in an evolutionary sense, as a coelacanth. And, after all, isn't that more impressive than many of those stupid beauties from the tropics.



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MAIL CALL

By William Vorderwinkler

If you have an aquarium question that you would like answered, send it to MAIL CALL. Each month the most interesting questions received and their answers will be published in this column. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245 Cornelison Avenue, Jersey City, N. J. 07302.

A number of questions

Q. 1. In *EXOTIC TROPICAL FISHES* it says that *Jubidochromis ornatus* needs very hard and alkaline water (this fish comes from Lake Tanganyika). Do other Tanganyika cichlids need this same type of water as far as pH and DH are concerned?

2. Why is it that almost half the fish in your book (*EXOTIC TROPICAL FISHES*) are almost unobtainable (even the lovely ones)?

3. Why do fluorescent lights and fixtures cost so much? The one for my 10-gallon tank cost about \$9.

4. How can I obtain the native fishes, such as sunfish, slimy muddlers, Florida bluefish, and mosquito fish (*Heterandria*)?

5. What about livebearers? I can't get the fishes I want that are from Central America.

6. Is *Gymnotus carapo* a peaceful fish when combined with other fishes which are non-aggressive and of about the same size?

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7. Are 16 dwarf cichlids too many fish for a 26-gallon tank about a yard long and a foot wide? How many would you recommend?

8. How many 4-inch cichlids (not dwarf) can I keep in a 50-gallon aquarium?

9. I am planning on keeping a mud-skipper. I have made plans for the place for the fish to climb out of the water and everything else, but how can I heat the small amount of water, about 2 gallons, in the tank? I am going to use fluorescent lighting that will not add heat to the water. What can I do?

10. I'm having problems with figuring fish capacity. So far I've run into three systems. One says, "If a tank looks crowded, it is crowded". Which is the most accurate in all respects?

11. Which would be the best for a 10-gallon tank in all respects: four American flagfish, four Australian pygmy perch, or eight (or less) Barber's tetras?

12. I disagree with the notion that a beginner is a person who tries to get as many fishes as he can get his hands on. I like to keep many different types of fishes more than breeding (which is fun, though). The only thing is that some people try to cram them all into one tank. If I want to keep lots of fish, I give them the proper conditions and more tanks.

13. Why aren't we getting more articles like the "Meet the Hobbyist"? And why aren't there more articles by people outside of the TFB staff?

David Porter,
Corona del Mar, Calif.

A. 1. *Tanganyika* is a large lake, and it is very unsafe to assume that the water is the same throughout it. The only thing

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to sell tropical fish supplies. Knowledge of fish helpful. Must have own car. For New England or Philadelphia, or Washington - Baltimore areas. Reply with full details in first letter to: Box 1, TROPICAL FISH HOBBYIST, 245 Cornelison Ave. Jersey City, N. J. 07302

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August, 1967

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you can do it to match as closely as you can the water in which they are being kept when you buy them, and if you want to try another type of water, avoid making rapid changes in any direction.

2. The book presents as great a variety as we can show, and of course many of the species shown were found in only small quantities and never subsequently bred. We are not unhappy if we show many fishes that you may not see, but we would be unhappy if we didn't show many fishes that you do see.

3. A fluorescent fixture and tube cost a lot more to manufacture and assemble, and they deliver a lot more light per watt of current consumed. It costs more to buy, but it delivers more light for less current, thus saving you money in the long run.

4. I once asked this question of a dealer, and he told me: "Nobody wants the darned things!" A dealer is always hesitant to stock fish which only a few people will buy, so you have a problem unless you can talk your local dealer into getting a shipment of what you want included in a regular Florida lot.

5. Same story.

6. *Gymnotus carapo* has been accused of being a fairly rough customer at times. I would hesitate to trust them in mixed company.

7. I would keep only about eight or ten,

and give them plenty of places where they could hide. If they are crowded any more than this, fighting might occur.

8. I would keep no more than six.

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9. Set a heater in a jarful of water and stand it in the tank water. This permits you to immerse it in a proper manner (with its thermostat submerged) and still not take up a lot of valuable space as it would if you placed it in a tilted position directly into the tank water.

10. Somebody once said: "Comparisons are odious", and the same can be said of generalizations. Some fishes are much more sensitive to crowding than others of the same size, so the safest thing to say is to stay a little below the "rule-of-thumb" limit. As for accuracy, you can't give a fairly accurate limit unless you know the species of fishes and the tank shape.

11. My personal choice would be the Barber's tetra. The flagfish might be a bit scrappy, and the Australian perch would not be very colorful.

12. Before he gets over his first enthusiasm (if he ever does), a beginner is very apt to get more fish than he can

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handle in the limited space he can give them. You have the right idea.

13. We aren't getting any more "Meet the Hobbyist" articles submitted lately;

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a school of my cardinal tetras contracted "ich". There were only about three spots per fish visible. My local chemist

measured out the required amount of malachite green according to the article.

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which was 10 mg. to 100 litres of water. This I administered to the aquarium. The next day the dye was not apparent in the water. Three days later the ich spots had increased to about seven or eight per fish. After leaving the fish in the water for another 3 days (then conditions grew worse), I considered the malachite green to be a failure and removed the fish concerned to a tank containing methylene blue. Your editor, Mike Reed, states that he has never heard of a case of ich that was not wiped out by the administration of malachite green. I am not trying to prove anyone wrong, only that the cure was apparently useless in my case. What could be the explanation?

Samuel A. Donaldson, Killeel, Ireland

A. Showed your letter to Mike, and he says that it's the first time he has ever

heard of a failure with this drug. There are of course a great many things which you did not mention, such as temperature or if you treated the fishes twice, as is recommended on the bottles of commercially prepared products. Contraction of ich is frequently the result of chilling, and your fish may have been kept at too cold a temperature during or after treatment.

Paradise fish
Q. I have a lovely albino paradise fish (male) in one of my 10-gallon tanks along with several mixed species smaller than himself. He seemed to get along quite well with them all until recently, when I introduced a male betta into the aquarium. The paradise fish attacked him and tore his fins to shreds. Why is this so? I have read that albino paradise fish are supposed to be quite peaceful

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toward all other fishes. Also, when I put my arm in the tank to replace a loosened plant, he rubes over and attacks my arm vigorously. Are all males of this species this way?

Wayne Slater, Valley Center, Kansas
A. No, Wayne, but a male without a female to keep him company gets to be an old grouch. He might consider a similar fish like a betta a mortal enemy and treat him accordingly. Why attack your arm? Oh, well, he's just nasty!

Algae
Q. I have a problem in my aquarium: algae. How can I get rid of it? I wash it with sponges, but it keeps coming back. Is there a fish that can eat this? If so, please tell me its name.

Jerry Guarneri, Pittston, Penna.
A. About the most available at the time is the so-called Chinese algae-eater, *Gyrinocheilus symonietii*. This fish is

misnamed: it is not native to China, but is widely distributed throughout Thailand. Another fine algae-eater is the plecostomus, *Hypostomus plecostomus*.

Dried daphnia
Q. I. I would like to mix tropical fish food with dried daphnia, salmon egg meal, and guppy diet. Would the fish die from this mixture, or will it be good for them?

2. Could you explain crossbreeding for me?

3. I have a brick platy that is trying to mate with a *Mollisneria sphenops*. Is it possible it can?

Lloyd Cypher, Butler, Pa.
A. 1. Variety is the spice of life, and fish foods are no exception. The drawback with dried daphnia is that drying takes out much of the food value and leaves nothing much of real nutritional value.

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However, the food is good roughage, and most fishes seem to enjoy it. Salmon egg meal is a very rich food by itself and should be fed sparingly. Guppy diet is usually a well-balanced blend of animal and vegetable substances. Die of this mixture? Heck, no. They'll probably throw up it!

2. Crossbreeding is a rather broad term which could mean breeding a male to a female of the same species with the purpose of arriving at some desired characteristic such as a combination of colors, finnage, etc. It can also mean hybridizing two fishes of different species, which sometimes results in fry which are "mules" (incapable of reproducing). Rarely, there may be hybridizations between two different genera of fishes.

3. Nothing is impossible, they tell me, but this comes fairly close.

Suicide?
Q. Could you tell me why certain fish like my 1-year-old pink goldfish would want to commit suicide by jumping out of the tank when it was filled almost to the top with no tank cover on?

Robert B. DeNagy, New York City, N.Y.
A. A fish does not have any power whatsoever to reason, like we humans have. Life never becomes so unbearable to him that he would have any desire to end it all. Suicide, after all, is the act of a person who does not want to face what is coming, and the fish that had the power to

think about what is coming has not been hatched yet. Your fish was frightened, no doubt, which is what usually makes a fish jump. Sometimes, however, they jump out of sheer playfulness, which is the best reason to always keep the tank covered.

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Guppy Corner



By Paul Hahnel

Nursery tank
Q. I have had much trouble raising baby guppies alive. My female recently had 64 babies. None of them lived.

1. Would it be good to have a small (5-gallon) tank set up for baby fish? It could be used for spawning, and for the babies to live until they are big enough to put into the main tank.
2. Is commercial fry food any good for newborn guppies?
3. How long after giving birth is a female guppy ready to mate again?
4. I like your GUPPY CORNER very much.

Bruce Britton, Mountainside, N.J.
A. Either your female had a good breakfast or your babies are dying on account of unsuitable living conditions.

1. I would recommend a 10-gallon tank where the water conditions correspond with those in the original tank as a fine home for a female ready to give birth.
2. I use it.
3. Female guppies, once fertilized, are able to deliver 5 to 8 litters from this fertilization, one every 25 to 28 days.
4. Thank you!

Garden dirt in the aquarium?
Q. I am not up to date on the mechanics of guppy raising, but I don't have the

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ills and complaints of folks who write you in 1974. My problem is getting a nice pair of guppies that are brother and sister, not a pair with a substituted female from inferior stock. Do you sell any of your fish? I am interested in raising guppies to sell; I have sold some and find it works out nicely. I work on a small scale using a 20- and 20-gallon tank in a south window, good old garden dirt in the tank, and lots of valisneria and algae; no other problems!

Don Perry, Holly, Mich.

A. To be up to date on raising guppies takes quite some time and plenty of patience to find the requirements and correct conditions to breed a good guppy. As I do not do any selective breeding I do not know which are brothers and sisters in my aquariums. Sorry, I do not ship any fish to individuals. I am aware that some hobbyists use garden earth

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under a layer of one inch of gravel for better nourishment of their plants. I myself use only gravel.

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Salts From The Seven Seas



By Alfred A. Schultz

mention and find a great deal of food there as well.

Q. 1. When in Barbados I went snorkeling in the clear water there. One thing I noticed was that there were many sergeant majors. Those that I have seen offered by dealers were only 3 or 4 inches long, but here they often attained 9 inches. Is this size unusual?

2. Another thing I saw was that one day there were huge numbers of beau gregory, while the next day there were none at all. Does this happen often?

C. Shaw, Wanamassa, N.J.

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Q. What plants are best in a marine aquarium?

Peter and Susan Brown, Annapolis, Md.

A. Do not use any plants at all.

Q. While in the British West Indies last summer, I saw a number of tiny bright yellow fish swimming around rafts and piers. They had several black bars on their bodies. Can you tell me what they were?

Farley Phillips, Long Beach, Calif.

A. You probably saw young surgeon majors, *Abudefduf saxatilis*. They are very common in the Caribbean Ocean. They like the protection in the areas you

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A. 1. Anyone who is interested in fish and goes to Barbados without snorkeling or scuba diving has missed one of the greatest things that lovely island has to offer. Yes, sergeant majors grow to the size you describe, but the dealers don't want to handle these big fellows. Not only would they require a lot of water when being shipped, but the buyer would need a very large tank to accommodate them comfortably.

2. Beau gregory, *Pomacentrus leucostictus*, are fishes that like to congregate in schools and usually when you see them, the water is swarming. These schools

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YOUR FISHES' HEALTH

BY MIKE REED

Aeration

A few days ago I was talking to a hobbyist and we got on the subject of filters. I mentioned that inside and undergravel filters aerate in much the same way as do airstones. "Sure," he said, "their bubbles release the carbon dioxide." Now this fellow was not a stupid man. But, obviously, he did not really understand just how aeration works in an aquarium.

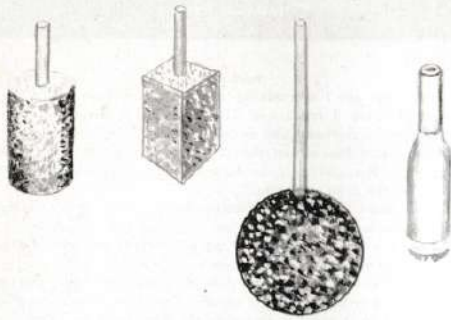
We all know aeration is important to our fishes. It is a safety factor that can help us keep a few more fishes in a tank that is otherwise too crowded. But how many hobbyists understand just how aeration works and what its side benefits are?

In the water of your aquarium there is a certain amount of carbon dioxide and a certain amount of oxygen. Your fishes require oxygen, much as we do, in order to stay alive. As they utilize the oxygen in the aquarium water, your fishes create carbon dioxide in its place. When oxygen is used by your fishes faster than it can be replaced in the water and carbon dioxide is created by your fishes faster than it can be eliminated from the water, the fishes begin to suffer. This is what happens in an overcrowded tank.

Virtually all gas exchange in an aquarium takes place at the water's surface. It is here that oxygen enters the water and carbon dioxide leaves it. The more surface there is, the more efficiently gas exchange can proceed. (This is why you can keep more fishes in a shallow, wide tank than you can in a deep, narrow one even if the deep one contains more water.)

The efficiency of the gas exchange at the surface can be increased by moving the surface in some way. An aerator with its bubbles breaking at the surface creates such movement. In addition, aeration circulates and mixes all the water constantly, assuring that there is no stratification, with oxygen-deficiency becoming more severe at levels below one another. (An indication of such stratification is the coming to the surface of all the fishes in a tank. This is most commonly seen in crowded, unaerated aquariums and goldfish bowls.)

What confuses hobbyists most about aeration is that it is not the air in the bubbles from their airstones or filters that is doing the major part of the aerating; it is the air at the surface of the water. The bubbles act mostly as water-movers, and an eggbeater or some other



Above are drawings of four of the many types of aerating devices available to hobbyists today. The first three diffuse the air from your pump through the tiny holes in the stone of which they are made. The one on the extreme right diffuses the air through the fall of its bottom. The screw at its tip can be tightened or loosened to control the size of the bubbles it releases.

stirring device set at a reasonable speed would aerate your tank just as effectively.

To be precisely accurate, however, I must tell you that a small amount of gas exchange does take place at the surface of the bubbles as they rise through the water. This amount is negligible, however, and can be discounted. The amount can be increased by using an airstone that releases many tiny bubbles rather than a few large ones. This increase is due to the fact that many small bubbles expose more surface to the water. Yet, even with this increase, the amount of gas exchange taking place through the bubbles is insignificant in comparison to the amount taking place at the surface of the water due to mechanical agitation by the bubbles.

Two important side benefits of aeration are the creation of currents and the even distribution of heat. Most fishes prefer living in water that moves at least a little rather than water that remains



Some species require more oxygen in their water than do others. Two fishes which need such conditions are the swordtail, *Xiphophorus helleri*, (above—photo by Dr. Herbert K. Axelrod) and the earthcreeper, *Geophagus jurupui*, (below—photo by Hansen).

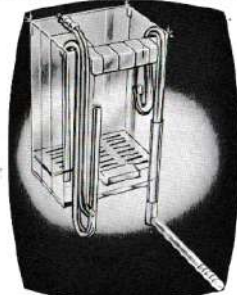


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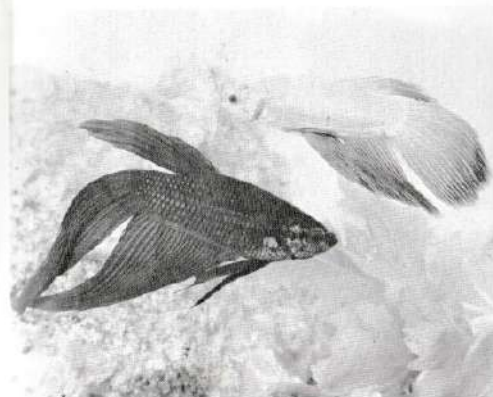
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Bettas and other anabantids can take oxygen directly from the atmosphere of the surface of the water. For this reason, they do not require water that is particularly oxygen-rich. Photo by G. J. M. Timmerman.

virtually motionless. You need only watch fishes cavort in the stream of water coming from a power filter to see that this is so. Also, unless the water in your aquarium is in motion, its upper levels will be considerably warmer than its lower ones. Such heat stratification seems to be more harmful to fishes in aquariums than to fishes in ponds or other natural bodies of water. The motion of the air bubbles is usually sufficient to distribute the heat in your aquarium fairly evenly.

Many people mistakenly give plants great credit as aerators. It is true that when the plants are in the light, they produce some oxygen as a total result of a process called photosynthesis. But, when it is dark, plants actually use oxygen and release carbon dioxide. This means they actually compete with your fishes at this time. Plants can add great beauty to your aquarium and should by all means be used for this purpose, but don't count on them to do double duty by being aerators too!



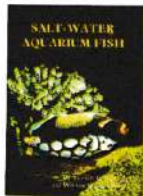
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When kept in ideal conditions, *Cichlasoma nigrofasciatum* is always in good color.

Breeding the Convict Cichlid *Cichlasoma nigrofasciatum*

BY RUDOLF ZUKAL
Brno, Czechoslovakia

This fish is native to the Central American country of Guatemala. In our tanks it gets to be 4 inches long. The subfamily Cichlidae mostly includes species which are unfriendly toward each other and other fishes; therefore it is advisable to keep them by themselves or in a small group of their own kind. Many species are very scrappy, and perhaps it is because of their habit of digging up the aquarium bottom that hobbyists avoid them. Before and after spawning they become even more pugnacious.

The basic color of the convict cichlid's body is silvery gray with 8 or 9 dark bars which extend from the back to the center of the abdomen. The forward 2 or 3 bars behind the head are slanted, and the rest are vertical. The fins are greenish in color with a metallic gleam. The dorsal and anal fins are reddish

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on the edges. The dorsal fin is covered on its hind end with dark streaks. The male is larger in size and loses these streaks during spawning time. The female is less deeply colored, and only during spawning time are the bars on the body a deep black. The state of health and their mood, as well as the water temperature, exerts an influence on the colors of these fish. Even though *Cichlasoma nigrofasciatum* is not particularly sensitive to temperature drops, it is advisable to maintain a temperature of at least 68°F.

I prepared a tank of about 20 gallons capacity for spawning, filled with normal tap water, with a gravel bottom, large rocks, and a flowerpot. There were no plants.

C. nigrofasciatum is one of the less pugnacious cichlids, and I had kept mine since they were quite small along with larger fishes. At other than breeding time they were very peaceful, one might even say a bit shy. When I had noticed that a pair made themselves at home in a corner and pulled up the plants there, I fished them out and put them in the tank I had prepared for them. On the second day the male examined everything thoroughly and paid the flowerpot a visit.

Soon he began chasing the female, almost forcing her to mate; if she did

A convict cichlid in full breeding colors. Note particularly that the face has darkened.
Photo by Wolfgang Bechtle.



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A male convict cichlid inspects the side of a flowerpot, an ideal spot for spawning.
Photo by Rudolf Zukal.

After spawning, the female stands guard over and fans the eggs. Photo by Rudolf Zukal.



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not appear very anxious to cooperate, the male bit and tore pieces from her fins. Sometimes he took a few moments to clean the flowerpot meticulously. Frequently he took time off from his cleaning duties to try luring her to the spawning site. At last she approached the flowerpot hesitantly. Courtship then began; the female was gently butted, and her fins were no longer bitten.

Egglaying followed. The eggs were laid carefully on the inside surface of the flowerpot. When the female began laying eggs, the male swam through the broken bottom end of the pot to follow her closely and spray the eggs with his sperm. Spawning behavior is not always the same with this species; once I noticed a spawning pair take a side-by-side position, like *Aequidens pulcher*.

After the eggs were all laid, the female took over the duties of guarding them. Usually both parents share this duty, but in this case it was only the female, and when the male approached she drove him away with wide-spread

During spawning, the pair must go through all sorts of acrobatics in placing and fertilizing the eggs on the side of the flowerpot. Photo by Rudolf Zukal.

