

TROPICAL FISH

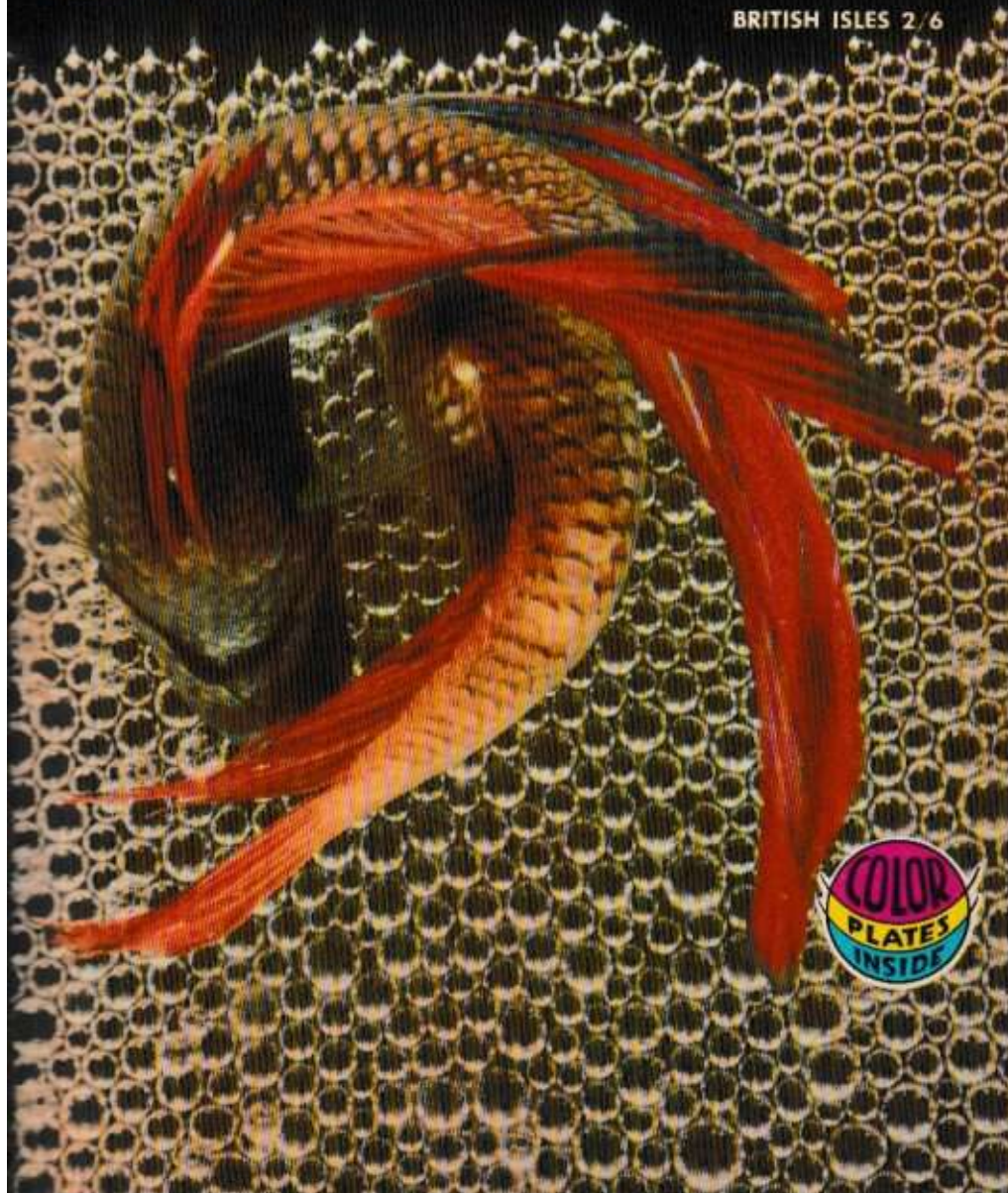
HOBBYIST

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MAY, 1966

DOMESTIC 35¢

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

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

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

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

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COVER
The view of Betta fish that you see in TFH each month has seen a heck of a lot of good fish photos (and about 10 times as many bad ones), but a batch of better spawning photos came in recently that even widened the eyes of some of our editors. The photos were on strips and were on a fish acetate chip, but more important, they were taken from directly below the fish. One of these unusual photos, showing a pair under their bubble-nest and just about to go into the spawning embrace, is featured on this month's cover. You don't want to miss the rest of the photos from this series or the detailed beta breeding article with which they appear. The story begins on page 2. Photo by Hanssen.

EXOTIC TROPICAL FISHES SUPPLEMENTS
Pages 32 to 36, 53 to 56. These pages are performed for easy removal and purchased to fit into the looseleaf Edition of EXOTIC TROPICAL FISHES.

RATES: 35c per copy in the U.S., 50c per copy in Canada or foreign, \$2.50 for 12 issue subscription in U.S., Add 40c per year for foreign subscriptions. All back issues available at 25c per copy (order in every 12th issue).

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

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. books are distributed exclusively through T.F.H. Publications (London) Ltd., 13 Nulley Lane, Bagnin, Surrey, England. All subscriptions and inquiries should be sent directly to them.

© 1966 T.F.H. Publications, Inc.
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc., at 245 Corlies Avenue, Jersey City, N. J. 07302. Printed in U.S.A.

EDITORIALLY . . .

How much do we actually know about some of our most common livebearers? Many reams of paper have been covered with the habits, genetics, requirements, and just about everything there is to be said about our ubiquitous guppy. Everybody has at some time or another had the thrill of finding babies where a short time back there was just a heavy female. Everybody who has kept guppies, or any other livebearers for that matter, has watched the thrust of the male's gonopodium toward the female in their lightning-fast copulative act. But if you want to start a hot argument some time, try to get some experienced guppy men to agree on how a female is actually fertilized. Does the male insert the gonopodium, does he just touch the female with it, or does he merely release the sperm cells nearer? If the sperm cells are released outside of the female's body, does she have the power to somehow "pull" them in? High-speed photography should help analyze this action. What strikes me as strange is that a fish which has been known for over a hundred years and has been kept by so many millions of people all over the world still has something about it which is not exactly known, something which has not been accurately and scientifically tabulated. The average reaction would be "Who cares?" But scientists are not average people; you can't just tell a scientist a thing is so. He wants to know why it is so and how it happens. When he finds these out, he wants to know if they are always so, and if another set of conditions causes things to be different.

William Vanderwinker

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This unusual photo was taken from under a pair of bettas preparing to spawn. The bottom of the bubble-nest is clearly seen. The female (right) is bending her body toward the male, and the male is curving his body to receive her in the typical anabantid embrace. Photo by Hanssen.

Breeding the Betta

BY CHARLES PETERS

Much has been written and said on the subject of raising Bettas, but it has always seemed to me that essential details have been left out. In the following article, I have set down all the requirements in detail so that any hobbyist with the slightest experience can achieve some success in raising Bettas.

The following items are required:

- a. (1) five-gallon aquarium (a larger tank would be even better).
- b. (1) 25 watt heater-thermostat combination.
- c. (1) aquarium cover, preferably glass or clear plastic, with a small hole cut in corner for the thermostat. It is necessary that this cover fit fairly tight.
- d. Water at least two weeks old, preferably taken from an established tank.

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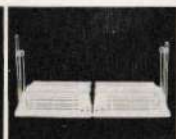
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- e. Plants. I use Water Sprite floating and also bunched and weighted to stay down with non-corroding weight (if using a bare tank).
- f. A vigorous male from seven months to one year old. (Sometimes, males that are younger are mature enough to perform the spawning ritual, but they are very rarely able to fertilize the eggs properly, and most of them will fungus.)
- g. A female of approximately the same age. (The white spot on the stomach of the female is no true indication of breeding capacity, for it sometimes appears in females three or four months old.) The best way to select a female is to find one that has good color, whose fins are spread, and who is heavy-bodied. Also, her color should match the male's somewhat, at least in fin color.

Male and female should be fed well for about two weeks prior to spawning. I feed dry food, shredded shrimp, (canned, washed and drained) white worms, liver and frozen brine shrimp and *Tubifex*. A word of caution: Feed white worms and brine shrimp no more than once a week.

Bettas eat brine shrimp ravenously and, although it is an excellent food, it should not be the exclusive item of diet. Bettas can be successfully spawned on a diet of dry food, shredded fish (frozen) and brine shrimp.

After the fish are well prepared and the tank has been set up two weeks with the plants, I introduce the male at about 72° to 74°. It is not necessary that he build a bubble nest before introducing the female, but a change of water usually brings about nest-building activity.

The female should be isolated in a quart jar; the jar is then floated in the aquarium with the male overnight. The next morning, the female is released into the tank and the temperature is raised to 78°. Now the reason for the heavy bunch of Water Sprite will become apparent. It is for the female to hide in when she is chased by the male. The male will chase, bite, and tear the fins of the female, but do not be too quick to remove her if she has a place to hide. Cutting down on light intensity will help protect her, and I sometimes place a few layers of newspaper, trimmed to fit close, over the tank to help conceal her.

During the spawning process, the male will embrace the female under the nest, and at each embrace a number of eggs will be released to sink slowly towards the bottom of the tank. The male, upon recovering from the torpor induced by the mating, retrieves the eggs and blows them into the nest. In this the female is definitely a hindrance, for she is just as determined to eat the eggs as the male is to save them. However, she recovers from the excitement of spawning less quickly than the male, so her egg-eating activity is kept to a minimum during the periods of egg release and recuperation.

When the egg production is finally completed, the male will chase the

Tropical Fish Hobbyist

female away from the nest, and it is time to remove her. This should be done without too much disturbance. If your cover fits closely enough, the humidity of the air between the cover and the water surface will be very high. This will be indicated by moisture which collects on the underside of the cover glass. The minute the cover is removed, some cooler, drier air will rush in as the warm moist air moves up. This will cause the bubbles to pop and will cause the nest to deteriorate. I take a leaf of Dwarf Lily or large Water Sprite leaf and gently lay it over the nest. This covers the bubbles and eggs, and you can work with the top off a lot better. Also, when you attempt to catch the female, it will help to prevent the nest from being broken up.

After the female has been removed, the male should be allowed to calm down for a few hours and then fed something tempting in the way of live food. This should be placed close to, but not on, the nest. A well fed male does not have the tendency to eat the fry when they become free-swimming.

If the eggs are fertile, they will hatch (at a temperature of 78°) between 20 and 36 hours after they are laid. When they begin to hatch and uncurl is the time when the male is the busiest. I make it a point to leave the light on over the tank continuously for the first two weeks after spawning.

A view from below of the completed spawning embrace. The male will now turn the female on her back. Photo by Hansen.



May, 1966



Some eggs fall away from the spawning pair. In the embraced position, the genital openings of the fish are so close that there is little chance that a healthy male will fail to fertilize virtually all the female's eggs. Photo by Hansen.

Twenty-four to thirty hours after hatching, most of the fry are free-swimming, or horizontal in the water and scattered in the tank. Removal of the male is mandatory just prior to this free-swimming stage; if left with the fry, he will eat them.

Removing the male is more difficult than removing the female. The female is usually in the fittest corner away from the nest and so is caught rather easily with a small net. The male is usually under or near the nest. I use the Betta's natural curiosity and pugnacity to lure him away from the nest and catch him. I put the tip of my finger into the tank, about two inches from the nest. He will spread his fins and move over to repel the intruder. If you slowly move away, he will follow. With a quick thrust of the previously wetted net, scoop him up and return him to other quarters.

The problem of feeding the fry is, of course, the biggest obstacle in raising Bettas. If you have an available source of green water, you are indeed fortunate and need not worry about losing too many of the young. If you can raise 50% to 75% you may consider yourself accomplished in raising fry.

When hatched, the young Betta is about $\frac{1}{8}$ to $\frac{1}{4}$ of an inch long and is mostly eyes. He is incapable of eating anything but the finest dry foods and small infusoria. If you can find green water, it should be strained through a fine mesh net before it is introduced into the aquarium to prevent damselfly eggs, may fly eggs, and small larvae from being placed in the aquarium. The young Bettas do not feed on the algae spores which make up the green water, but the infusoria in the water does feed upon the green water, and the young Bettas feed upon the infusoria. In the absence of green water, I use the standard egg yolk formula or the new tube foods for egg layers, plus dry foods sprinkled on the surface and infusoria cultured by the usual methods.

I have found through close observation that baby Bettas will attempt to eat fine dry food sprinkled on the surface, but they are not strong enough to break through the surface tension film, which usually has a somewhat oily appearance. At the end of the first week, I introduce quarter size Mystery Snails to clear up the excess dry food.

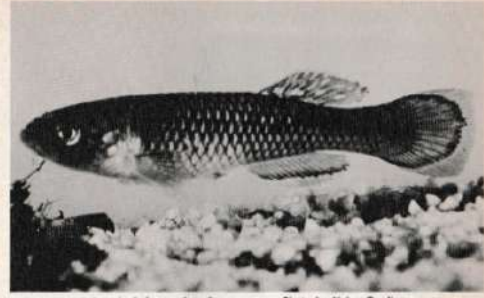
If you are able to maintain a sufficient supply of culture medium, you should be able to start feeding newly hatched brine shrimp in about three weeks. I feed my young Bettas three times daily when they are capable of taking newly hatched brine shrimp. If you can get them to the brine shrimp stage, your biggest problem is over.

While you watch your Bettas for the next few months, you will notice a wide range of sizes. Do not be too concerned, as eventually most will mature at six to seven months. There will be some that will never grow, and if your Bettas are five months old and not over $\frac{1}{4}$ of an inch long, you are wasting your time with them.

When my Bettas are about five weeks old, I introduce mild aeration into the tank in order to break up the scum on the surface and better enable their labyrinth to develop.

Crowding many Bettas into a small area is not really detrimental if you have enough food and aeration. In fact, a large number of Bettas in one tank will prevent any one individual from being picked on, because the bully has so many choices he just moves toward his target without really getting nasty.

I hope some of these suggestions may help you in the feeling of pride that comes of raising Betta fry to maturity. Spawning Bettas is not difficult, but raising the spawn to healthy adulthood is an accomplishment.



A male *Aphyosemion cinnamomeum*. Photo by Heinz Oehl.

For killifish fanciers . . .

Aphyosemion cinnamomeum

BY JOHANNES FRANZ

In 1962 there was discovered in a spot only 44 miles north of Kumba, in the Cameroons, a new and very colorful species of *Aphyosemion*, which was named *Aphyosemion cinnamomeum*. This district is a slightly hilly territory with a very high rainfall. Its average annual temperature is about 78 to 80° F. and variations are very small. Rain falls throughout the year.

Many of our well known *Aphyosemion* species live here in the dense jungles, where there are clear brooks, and the decaying foliage gives a brown tint to the water.

As with all the *Aphyosemion* species, *cinnamomeum* females are very modestly colored. The body is a simple grayish brown, and the scales have a reticulated pattern, particularly along the lateral line. Except for the colorless pectoral fins, all fins have a greenish tint. On the other hand, the male shows lovely colors. The body is a shiny cinnamon color, and toward the end there are light golden tones and a striking blue to violet which, however, depending on how the light strikes it, can be greenish. The tail is fully rounded and, like the anal fin and the ventral fins, has especially beautiful colors. A gleaming blue makes these fins stand out, and besides, they also have a gold edge. The dorsal fin has a cinnamon color and a bright blue to greenish pattern.

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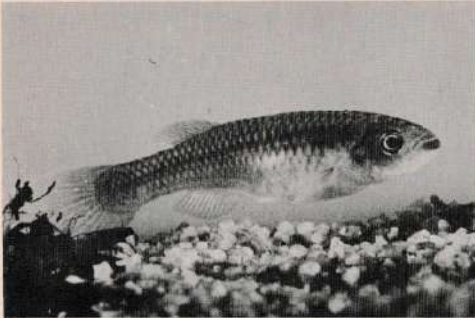
The lyretail, *Aphyosemion australe*, also has a cinnamon-brown body-color. Photo by Hanssen.

The pectoral fins are different; their color is a reddish gold which continues into the fin base on the body. All this gorgeous array of colors makes a particularly good setting for the emerald-green eyes.

This species seems to have an exceptionally long life-span, and the beautiful colors of the males develop quite late. In the fourth or fifth month the gold edge begins to form in the tail. Gradually the other colors begin to develop, not becoming complete until the fish is almost a year old. Before this time the males cannot be distinguished from the females.

Maturity also begins at this time. The females develop their first eggs, and the males try their first spawning activities. These eggs are infertile, however. My fishes' first fertile eggs showed up 8 weeks after this time, 4 remaining clear out of a batch. Of these 4, only a single youngster hatched; the rest died in the shell. This youngster was unable to swim and lived for only a few days. Further batches resulted in only 2 eggs which did not turn white. These developed, and one hatched, but the other died. This youngster had dark flecks of pigment on his head and somewhat lighter ones on his body. Unfortunately this one died after photographing, probably having become damaged in the process. The adult males did not become fully potent until they were 18 months old. From this time on the youngsters developed normally, and there were few bad eggs.

The general care of *Aphyosemion* species is widely known, and a description can be skipped here. I myself kept them in slightly peaty water of 6 DH and a temperature of 72° F. The addition of salt is not necessary.



A female *Aphyosemion cinnamomeum*. Her relatively drab coloration makes her easy to distinguish from the male. Photo by Heinz Quell.

At first the eggs which hatched approximated 30%, but later on 90% of the eggs remained alive. By adding acriflavine to the water an additional 5% could be kept alive, cutting the losses to only 5%. After 10 days at the latest a change of water is beneficial, because acriflavin can cause some premature hatchings, before the yolk sac has been absorbed. The resulting fish are not capable of surviving. At first a daily check and separation of the dead eggs is necessary. After 5 days one can scarcely ever find any more bad eggs and their development can be followed with the naked eye.

In order to eliminate the time-consuming task of separating the eggs, I used the method of storing them dry. The parent fish were left several days in the breeding tank, after which the peat moss with the eggs was taken out, pressed gently, and placed in a glass jar which was covered in such a manner that a small amount of air could get in. They were left here for 1 month.

After this period 1 inch of water was poured in, and on the next day there were many youngsters which had hatched. They were mostly found near the bottom at first. I separated the fish with their water and then poured aged fresh water on the peat moss once more. On the next day there were just as many fry again. This was repeated for several days, and up to a week later there were a few more fry to be found. After this, there were no more.

Raising the fry is not difficult, but the water must be kept clean at all times. Newly hatched brine shrimp are taken from the start. In spite of this, growth is not as rapid as with the other *Aphyosemion* species, which probably accounts for their delay in maturing.

At the moment my males are a little under 2 inches in length, and the females a little smaller. I believe that this new *Aphyosemion cinnamomeum* will be an asset to our aquaria with its beauty, just as has its long-known relation, *Aphyosemion calliurum*.

Aphyosemion cinnamomeum is a fish which lays its eggs on the bottom. Attempts at getting them to spawn on top in nylon fibers and fine-leaved aquatic plants were unsuccessful. There were no eggs until the introduction of peat moss offered them the possibility of burying their eggs in the bottom. As soon as this peat moss was introduced the fish were drawn to it as with a magnet, and a short time later matings could be observed. During these the male changed his colors and closely resembled the dark peat moss. Only the gold fin edges gleamed in contrast.

With short dashes the male tried to lure the female over the peat moss, first swimming toward her and then toward the peat moss. After a little

An *Aphyosemion cinnamomeum* pair (male at left) dig into the peat moss in which they will spawn. Photo by Heinz Quell.



Aphyosemion calliurum, one of the most beautiful and popular of the aquarium aphyosemions. Photo by Hansen.

hesitation the female followed and then was pushed toward the bottom by the male. He then tried to get alongside of her to wrap his anal and dorsal fins around her. Both curved their bodies in an S-shape and wallowed in the peat moss, almost disappearing. In the next moment the peat moss flew high from a beat of their tails, and the first mating had been completed. In this manner one mating after the other followed until the female's egg supply was depleted, and she left the spot.

Spawning generally takes place in the morning hours. The clear eggs have a sticky thread and are firmly attached to the peat moss fibers. They are irregularly formed at first, but as soon as some water gets between the egg covering and the plasma layer they become round and firm. The egg can then be picked up without causing any damage. A droplet of oil, which is in the egg at the beginning usually breaks up after 24 hours into various-sized globules and begins the cell division. The embryo that develops grows about a third of the way around the yolk-sac after 5 days, and in another 5 days surrounds it completely. The eyes can be seen at this time. The egg covering turns brownish, and a week later the fry is completely developed.

Development is not the same in all eggs, but in most cases the fry hatch in 3 weeks. This is how 130 eggs hatched: after 17 days, 1 fish; 19 days, 1 fish; 20 days, 28 fish; 21 days, 16 fish; 22 days, 39 fish; 23 days, 8 fish; 24 days, 6 fish; 25 days, 4 fish; 26 days, 5 fish; 27 days, 9 fish; 28 days, 3 fish; 29 days, 2 fish; 30 days, 33 days, 34 days, and 39 days; 1 fish each. In the remaining 4 eggs, the embryos died in the subsequent days.

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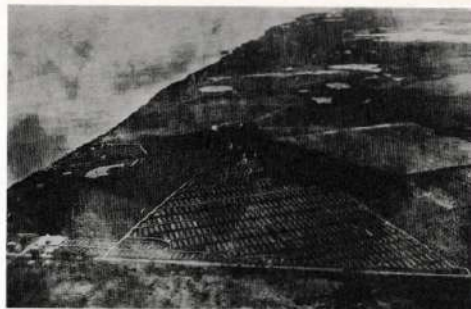
N. B. Marshall is Senior Principal Scientific Officer in the Fish Section of the British Museum (Natural History).



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An aerial view of Gulf Fish Farms, Inc.

A 13-year-old hobbyist's dream job . . .

My Summer at Gulf Fish Farms

BY BARRY DUKE

"Well, how does it feel to be a 13-year-old working man?" This is a question that was asked of me I don't know how many times last summer. My answer? "Just great!"

I spent this past summer working at Gulf Fish Farms. (This was possible because my dad just began working there.) Fresh from the city, I walked into Gulf my first day, and my father tells me that they just shot an alligator outside! Well, this sounded real neat to me. I said, "Wait till my friends up North hear about this; they'll flip!" Well, I almost flipped when I saw the first snake they brought in. A big black snake! It looked about 10 feet long! When I asked one of the field men how long it really was, he said, "Heck, it's only a little 5-foot-long gopher snake. You should see some of the big ones." You can bet that that cured me; I asked dad if I could work inside, instead of out in the fields. But he insisted that I try every part of the farm operation, and I supposed that included getting attacked by alligators and snakes.

I asked when I was to start work, and my father said, "Just as soon as you move that butt of yours over to the man with the baseball cap on." The man was Joe Washington, and he had a really thick southern drawl. His first words to me were, "You're late." "I'm sorry," I replied, "but I thought I

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was on time; it's only 8:00 a.m." Joe then informed me that the working day started at 7:00 a.m. "When does the day end?" I asked meekly. "When the work is done," he replied.

For the rest of the day, I just watched Joe as he drove the scooter he uses to get around the farm. When I remembered my father telling me that you only have to be 14 years old to drive a motorcycle or scooter in Florida, I figured I'd add a year to my age real quick and start asking Joe some questions on how to drive. He told me not to ask questions. "Just drive boy. Don't you know anything about cars or cycles?" I explained that up North you had to be 17 just to get your permit. "How can they deprive those northern kids of getting around like that?" he asked.

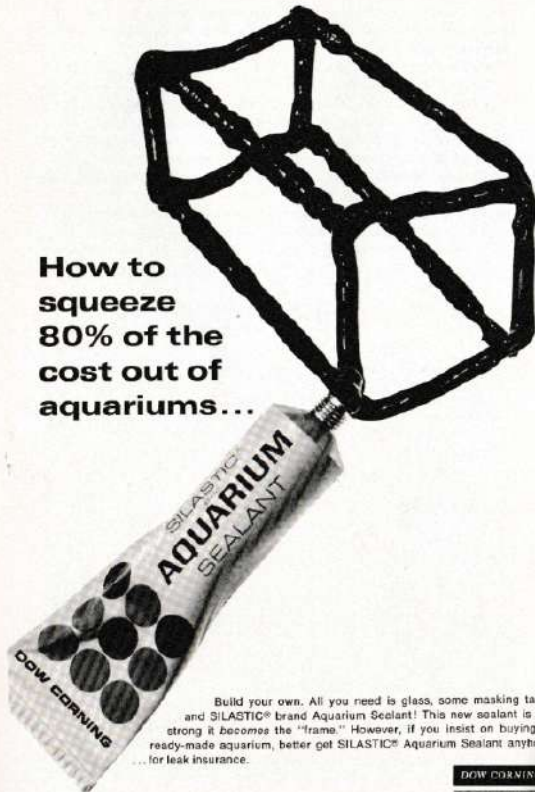
When I got home that night, my mother was shook up to hear that I had driven the scooter all afternoon. She was even more upset when I said that when I turned 14 I was going to buy myself a Honda! She informed me that I was lucky if I even got my license by the time I was 17. Well, I figured, so much for that!

My second day of work started at 6:00 a.m. That's the time my father dragged me out of bed. When I got to the farm, I began to learn quickly. Joe's job was to trap and grade fish. I sat on the side of the scooter as we went from one pool to another. I watched Joe bait, set, and pull the traps in. By 10:00 a.m., I was starved. I asked Joe how much longer it would be to lunch, and he said, "Only another 2 1/2 hours."

I soon suggested that we go back to the main office for a snack, but Joe insisted that his job "wasn't going back to the office every hour for tea."

He then explained to me that the fish we had trapped had to go back to the packing room, and that I could drive them back while he stayed on to trap more. He laughed as he said that the packing room was right next to the office, and I could have my snack. But first he wanted me to lift the last trap from the pool and bring it to him. My tight pants prevented me from easy movement, and my sneakers didn't provide much protection from the water and the mud at the edge of the pool. After making every possible mistake and sinking in up to my knees, I finally reached the trap and lifted it out of the pool to the accompaniment of Joe's good-natured laughter, laughter that I was to hear throughout the remainder of my learning period. (Of course he did something other than laugh the time I started the scooter with a jerk and pulled out right from under him, dropping him into the dirt!)

One day, Dave, one of the other men on the field crew, offered to teach me how to feed the fish. He took a big tub full of a snowy-white food of some kind and loaded it into the scooter. I tried to lift the tub, but as soon as I made a motion for it, Dave said, "Good luck." He was right. It was so heavy that I couldn't budge it. Well, we went down the first row of pools; I drove while Dave threw in the food. As we got further out into the fields, we switched. Dave drove, and I was to feed the fish. My first throw came right



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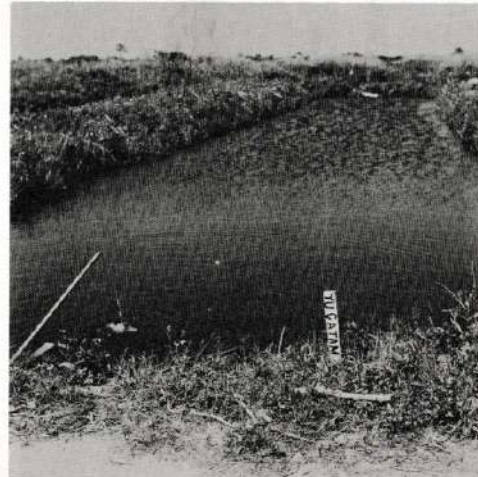
Consumer Products Division, Greensboro, N. C.

back at me, and I was covered with fish food from head to toe. I then told Dave I would drive the rest of the way because I didn't think my mother would appreciate me coming home as white as a ghost.

Both Joe and Dave were good teachers; I soon knew how to sex and identify the various livebearers that are raised on the farm. I also learned the location and contents of the 1,017 different pools. I was quite proud of myself when the time came for me to move on to the next department. I was already trapping and grading fish on my own, with Joe, of course, giving them the final check before I brought them into the packing room.

Well, I had learned all about the field men and their jobs, and my next stop was "The Plant Room." I was introduced first to Heiko Bleher, a 21-year-old Brazilian who had recently come to the United States and was a tropical plant expert. The second man was Sonny Marine, a short fellow with shoulders as wide as a door. He was part Indian and had spent many

Each pool on the farm has a marker stick on which is printed the kind of fish growing or being stored in it. This pool contains Yucatan mollies.



summers living with the Seminole Indians. The third man was Bob Porter, a quiet kind of a guy who was also a commercial artist.

There was an awful lot to learn in this department, so I got right down to business. When I met Heiko, he was planting a vat of Amazon swords. So, naturally, my first job was to help him complete the planting. He had to pick out some fish breeders to set up that night, and he told me to finish the planting of the swords. It was my first job here, and on it I made my first mistake. (I don't waste much time.)

Oh, don't worry, I planted them, but I planted them in the wrong way. I just made a hole with my finger and stuck the swords in. That's what it looked like Heiko was doing, so I did it also. The next day, when they put the water in the vat, all the plants came floating to the top. Heiko laughed and said that I hadn't planted them deep enough. So there I was, emptying out a whole vat of almost 1,000 plants! I had to take out the plants, tamp down the dirt that I had disturbed, and replant the plants all over again. Believe me, it isn't easy to do all that, spacing all the plants evenly and planting them deep enough.

It took me 4 hours to complete that job. After I was finished, Heiko took

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me around to all the vats in the building, telling me the names of the plants in English first, then in Latin. He told me that there were three types of aquatic plants. The rooted plants, the floating plants, and the cutting plants.

Then came my second mistake. Heiko told me to take a vat of banana plants and cut them down because the leaves were all rotting. He said by cutting them down they would grow new leaves which would be better than what they now had. Well I cut them. Yup, you guessed it. They all died. After Heiko got through with me on that mistake, you can imagine how I felt.

Each morning we got the plant orders at 7:30 a.m. I learned to go into the office and copy down the customers' plant orders and take them into the plant room, where I taped them to a bin in which the plants were kept until they would be shipped. We would look at each order, filling them one at a time. For instance, if a customer ordered 25 anacharis, 50 cabomba, and 150 banana plants, we would go to the vat which held anacharis and count out 25, plus 2 or 3 for a bonus in case a plant or two died during shipment. Then we would move on to the next types of plants and count them out.

I then had to learn how to pack the plants for shipment. Heiko showed me how to wrap them. You simply take a sheet of newspaper, wet it thoroughly, and wrap the plants in it. Then take another sheet of newspaper, this time dry, and wrap the plants and wet paper in the dry sheet. This keeps the moisture in the plants.

The next thing I learned was how to take down the brine shrimp. Brine shrimp was fed to all the fish in the room once a day. The brine shrimp came in as eggs. We put the eggs in salt water and aerated them. In about 24 hours we'd have baby brine shrimp. But you have to take the brine shrimp from the hatching tank and put them into a bucket from which you will feed. The way you do it is to syphon out the water with a hose. Nobody but me would have been dumb enough to believe somebody who said to take a long drag to start the siphoning action. So I took such a long drag that I swallowed enough salt water and brine shrimp to choke a horse.

Well, the next thing they *tried* to teach me was to sex egglayers. They started off with an easy fish, the black ruby barb. They told me first that the male of any kind of fish is more colorful than the female. But that didn't help me much. I still made mistakes. Sonny had to pick out his breeders, so he gave me the net and said, "Here, you pick out the breeders, and I'll watch." After three pairs I was batting zero. I had picked out two males and two females, but then there was a serpaè in with the barbs, and I took it for a female barb. So I had a male serpaè and a male barb as a pair. Sonny then told me that the females were much heavier than the males. That helped! Soon I caught on and raised my batting average. I picked out 26 pairs of black ruby barbs that afternoon, and they were now ready for breeding tanks.

I watched Sonny fill the breeding tanks with a special kind of water. I asked what kind of water it was, and he said that it was acid water, which is

good for breeding fish. Then he was fooling around with this hairy stuff. He thinned it out and then put it into the tank. I also asked what that was, and he said it was spawning grass. The spawning grass is native to Florida, where it hangs from cypress trees. When you dry it out, it turns a black color, and that's when you can use it for spawning fish.

The next morning, I went around with Sonny looking at each tank in the building to check for disease. We found one tank of baby black ruby barbs with ich. Which, as you probably know, looks like very fine salt sprinkled on the fish. Sonny got a little bottle of methylene blue and put some in the tank and told me to watch the tank for a few days. Sure enough the disease cleared up.

Later that afternoon, Sonny was going around to the tanks and putting water from each in a test tube. Then he added some other blue dye to it. He shook the mixture and it turned green, blue, or yellow. He was taking the pH of the water. That tells if the water is acid or alkaline. The things I was learning were starting to get complicated, so I started taking notes about what I had learned each night.

Now that I knew a little bit about what was going on in the department, Sonny gave me some responsibility. Every morning, I was to take care of

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the plant orders. Also, at the end of the day, I was to check to see that all was well with the fish in the room.

I was amazed when I saw Sonny put some breeders in a tank and they had spawned the next day. So I tried. Sonny said I should start off with the easiest fish to spawn. The blue gourami, a labyrinth fish. This is a fish that blows a bubble nest. When you put the male and female in the breeding tank, if the male is ready to spawn, the first thing he will do is blow a bubble nest. (It is best to have a floating plant for him to blow it on.) When the pair is ready to spawn, the male will wrap his body around the female and squeeze her eggs out. When he is finished with that he will collect all the eggs in his mouth and put them in the bubble nest. As soon as you see they have spawned, it is best to take out the female because she will try to eat the eggs. But the male will protect and care for the eggs and for the babies until they are free-swimming.

I did all this with the blue gourami and was very successful. I had a very big spawn with nowhere to put them. So I had to split them up into two tanks, and when they were about a month old, I put them all outside in a pool where they would grow much faster.

When Dr. Herbert Axelrod was talking with my father, my father told him about my breeding. Dr. Axelrod asked me to do some experiments for him. I said to him, "You don't want me, you want an experienced breeder." And his reply was, "That's why I picked you." He asked me to spawn every fish on Gulf's large price list. And some of the fish on Gulf's price list haven't even been spawned before by experts! He wanted the temperature at which each fish would spawn and also the temperature at which the eggs would hatch. Up to this day, I only have 6 fish finished.

About a week after I started my experiments for Dr. Axelrod, the A.P.P.M.A. Trade Show was in New York. I went to the show with the group representing Gulf Fish Farms. I helped set up the display and talk about Gulf's new plant department to all the customers. Since I had to go to the Trade Show, I had to drop my experiments right in the middle, and they got all screwed up.

After the trade show, I had about 2 weeks until school started, so I worked for 1 week, and took a 1-week vacation.

That last week, when I was taking my vacation, Dr. Axelrod came down. I remember that in the past when my father talked about fish with him, I couldn't understand a thing. Now when he talks with dad, I can contribute what I know and learned on plants and fish this past summer.

This summer helped me a great deal in school, where I wrote a report on breeding the black ruby barb. And I'm sure the background I have now will stay with me and be useful for the rest of my life. Also it is responsible for teaching me how to write professionally, because if it wasn't for this summer at Gulf, I wouldn't be writing this article!

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Think YOU have troubles?

Collecting Fishes in Darkest Africa

BY PIERRE BRICHARD,

Leopoldville, Belgian Congo.

There are places on Earth where it is good to live, where the everyday worries are just routine: what to cook for dinner, or how to deal with a difficult business problem. There are places where people plan their summer vacations and look forward to the good time they will have on New Year's Eve. There are places in the world where looking at the smiling faces of your children doesn't send a cold chill down your spine, where you just plan their future and don't fear that they will be dead or awfully mutilated . . . next day . . . next week . . . next year. In most of these places you meet people who may be friendly, indifferent or just unpleasant; but you don't feel that they are a constant, ever-existing menace to your life.

There are many places like that, but there are others too, where life is a continual struggle to keep faith in the future, yours and your children's, to find food, to keep the business going; where there are no more plans, where you have to remain quietly in front of a rifle handled by a madman, not once but today, again next week or next month. Where you hear that in a town only a few hundred miles away the armed forces ran amok and raped, pilfered and killed without any serious reason, where the traffic officer who stops your car will ask your wife questions in front of you which in any civilized country would get him jailed for years. Where you are arrested without knowing why—and there is no reason, just the fun the police officer wants to have at your expense, which is where it usually ends (but not always), with a generous tip he just wanted to have when arresting you. Where the prisoners in the city prison get out and in at will to make some daily burglaries, where sometimes you cannot go to the local letter-box at night without being held up.

There are places like that in Africa; you have heard of them, your television set has brought you to them for a hasty visit, but we, we live in the Congo. The last time I wrote in your magazine (May, '59) about my experiences in collecting fishes for your aquarium seems to be fading in a very remote past. Then everything was peaceful, the people friendly, fishes were sometimes new (even to me), and my worries were the kind to be found in any country. Perhaps it seemed exciting from your armchair, and certainly it was for me as well. Now there is a bit more excitement, a bit too much even after you get used to it. I am not given to a pre-set, patterned life, or I wouldn't have come here. I like the unexpected, even if there is some flavor of danger in it. But to be hindered in the smallest move, to have danger so real that your stomach is

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upset, to be unable to determine from which direction it will strike, or when, or if perhaps it will strike your own family, is too much.

You cannot help thinking how good it would be to spend a week's carefree vacation in a desert, with plenty of food and nobody to watch you with a suspicious, cynical grin. How wonderful it would be to forget such worries, even for only a short while!

If, in the past, you imagined that our fishes had some of the mysterious thrill of Dark Africa, you might perhaps be interested to know what is behind the crazy Catfish swimming upside-down in your tank. The following reminiscences of my recent fish-collecting activities will give you an insight into things as they now stand in the Congo.*

The white pencil-like beam of a powerful searchlight wandered on the green tips of the swamp reeds, outlining their irregular wall against the pitch-black water and the night. We stood still, partly hidden among the grass, staring blindly at the army patrol boat in the distance, trying to hear if the humming of her motor was increasing or not. The searchlight turned to another point, and slowly the boat faded in the shadow. We resumed fishing with a minimum of noise and collected a few more Upside-down Catfish, but the fear of danger made us work faster; instead of enjoying these fishing trips as we always did before, we were anxious to be back home. We were deaf to the rhythmic croaking of hundreds of frogs, to the *hokhokok* of the waterfowl and the buzzing of myriads of hungry mosquitoes. We were alone, unarmed, without any protection, and it is dangerous to be alone on the mighty Congo River, or anywhere outside of a big city in Congo in Anno Domini 1961.

The car was speeding along the dusty, bumpy, winding road which leads to the rapids of the Congo River. It was a holiday for the kids; they had asked to go fishing with Daddy, they with a line and I with my usual equipment at a spot where, back in 1958, Dr. Axelrod and I had collected fishes. At a curve in the road a few hundred yards from our goal a few members of the local army, helmeted and carrying their rifles in their usual careless fashion, appeared and waved us to a stop.

"Where are you going?" one of them asked.

"To Kinsuka."

"What for?"

"To go fishing and meet my fishermen."

"What for?"

"Because it is my business!"

*At the time this article was first submitted, the situation in the Congo was considerably worse than it is now. But, even now unrest, cruelty, and violence are commonplace in many areas.

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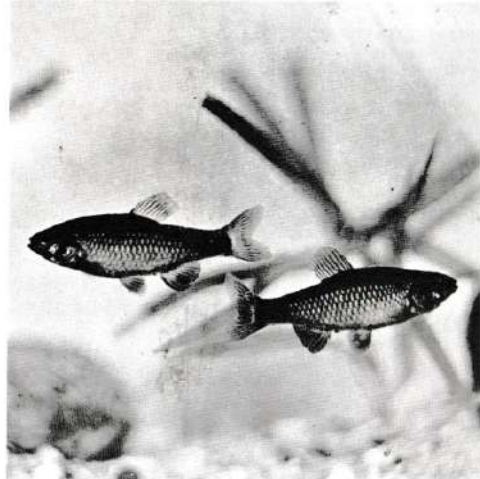
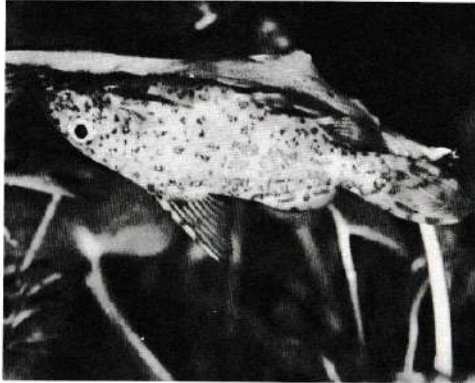
"There is no business for you there. Go back!"
 "But why? This is an open road, open to civil traffic."
 "Not for you!"
 "But I have to go to my fishermen and pay some of them! It is their only living, and they need the mercy."
 "Let them wait. They don't have to work for you Belgians! Go back!"
 "But again, why?"
 "Because it is my will, and I am the boss here!"

So, very few fishes from the rapids, because I cannot go and fish and my people don't fish much any more. For them it is even worse; they are just slaves where it comes to the soldiers. So they go away, out of reach.

My best fisherman came back from three hundred miles away with a long depressed face and empty fish containers. This is quite unusual with him, as he is always eager to bring back something new and is far from lazy.

"Well, Jean," I said, "what happens? This ought to have been a good spot. The waters are not too high, and the swamp has not been fished for many months. There ought to have been fishes, and you bring nothing? You received sketches of the fishes you could chance to fall upon, you had a letter

The Upside-down Catfish, *Synodontis nigriventris*, is native to the Congo region. Photo by Klout Payson.



Neolebias ansorgei is also commonly found in the Congo region. Photo by G. J. M. Timmerman.

for the local chief of your tribe, so there was no taboo to fear, nor to be killed by foreign people. What's the matter?"

"Ah, Patron," he answered, "never will I go back in that area. It is not the people. They were all fight, friendly and a good help. I got the fishes you wanted, but as soon as I got on the road to find a truck to the nearest railway station there were patrols and more patrols who stopped everybody to check papers and search everything. We waited for hours in the sun and the fishes died!"

Looking at my half-empty tanks today, I could not help but think about the wonderful new fishes which might be collected in this country if only the situation were a bit more peaceful, if we could travel wherever we wanted in peace without being endangered by a single drunkard. I dreamt about the blood-red *Distichodus notospilus* only a few hundred miles away, the gorgeous

Nothobranchius brioni in the Bukama area in northern Katanga, probably one of the most unsafe places in the world, the Orange Neon of Boende, the jade-green *Neolebias ansorgei* of the lower Congo, the *Monodactylus sebae* from the estuaries and the wonderful Cichlids from Lake Tanganyika, another sleeping volcano. If it were only for routine hardships, such as might be expected in any business when you are on your own, if it meant only a lot of careful planning, a lot of sweat in the sun and mosquito bites at night, it would be fun. Even unexpected floods like we have now with waters the highest they have been since 1888, or dried-out pools such as might happen during the dry season, would be no more than just bad luck. But when you are thwarted at every turn, when you spend money, effort and time, when you expose yourself and all your family just to see everything go wrong because some kind of insanity has undermined a country which you have come to love as your own, this is almost too much. When your best efforts are ruined because you can't get a nylon net with which to equip your fishermen, or wire mesh to make traps, or even a ballpoint pen to write with. When you should find protection against outlaws you find that the worst outlaws are those whose job is to have the laws obeyed. Everything is as if seen from behind asylum doors and you wonder why you stay and keep going on day after day, month after month without profit. Nobody wants to leave something which he has built with much hardship and love, and there are many others like us who are waiting and working against all odds to keep their business alive for the future, if there will be one. I had the fortune to have an occupation which brought much excitement, the kind which perhaps you have dreamed about when you were tired from your humdrum everyday tasks. Like yourselves I love fishes; for me they are a link with the rest of the world which I sometimes dream about. In places like this one, when your worries sometimes overwhelm in your straight thinking, it is good to speak about them with friends who have the same interests and who will be able to understand and sympathize with my eagerness to keep going on.

If today I don't feel so well and don't go to look for the elusive Angel Catfish, for fear of troubles, perhaps tomorrow when I realize that this lovely Catfish is one of the very few links I have with the outside world, will I be able to collect my heart first and your Catfish afterwards. When you see him swimming in your tank a little while later, perhaps you will like him better as a peaceful messenger from a troubled Congo and a troubled collector.

EDITOR'S NOTE: The last time I met Pierre Brichard things were just beginning to boil in Belgian Congo. I remarked that he was probably glad to be away from it. On the contrary, he told me; this was a very interesting political situation which he would like to study first-hand. The disappointed, almost heartbroken tone of the above article is ample evidence of the great disappointment he must have felt when he finally returned to the land which he loved.

How to Become an Ichthyologist

Part 2*

BY DR. GEORGE S. MYERS
 Professor of Zoology
 Stanford University

Boys and girls who are interested in fishes and want to become ichthyologists are often naive, and ask questions which at first glance seem to be silly. For example, a boy recently wrote me to ask a number of questions about why the discus fish (*Symphysodon*) does this and that. The questions were mostly unanswerable in the form he put them, because we know very little about why *most* fishes do this or that. I told him that the only way to answer his questions was to *ask the discus*—that is, to conduct prolonged, careful, experimental work on the behavior of discus. Even then we might not come out with any real answer as to *why*. But a boy who has the curiosity and the brains to ask such questions is not one to laugh at or have his interest stifled. Most of the great scientists of the world became such because they had the brains and the curiosity to ask questions that the great scientists of the time were unable to answer—and because they kept their curiosity! It is mostly plain human curiosity as to how and why things happen that is responsible not only for such things as man-made satellites but also for the fact that over half the people who read this article didn't die in infancy, as they probably would have without modern biological, medical, and chemical science.

However, the boy or girl who has an abiding curiosity about fishes, and who wants to become a professional ichthyologist, has a stiff education to get. In my own youth, there were a number of professional scientists of all sorts who had little formal schooling in their specialties. Those days are gone. Even a 4-year college B.A. degree will not get the young scientist very far today. Nor will a master's degree (M.A.), which is obtainable with a year of extra study after the B.A. For any advancement in a scientific profession today, or even to get a first job in most of them, a doctor's degree (Ph.D. or D.Sc.) is necessary. That means 3 or 4 years at a university after the B.A.

To parents wondering how to put a student through 4 years of college, this may seem to be an impossible extra expense, but things are not quite that bad. After the B.A., if the student has made a reasonably good record (a "B" grade average), there is much help for a youngster who wishes to start on graduate work towards a doctor's degree. The majority of graduate students earn most or all of their tuition and living expenses as half-time teaching or laboratory assistants, or obtain fellowships or other types of assistantships at the university. This half-time work prolongs the years of study beyond the minimum of 3 years necessary for a doctorate, usually to 4

*Part 1 of this series appeared last month.

and often to 5 years. Many if not most present-day graduate students marry, and the wife works while her husband finishes his doctorate, thus helping with the family expenses until the man gets his first position. Few science students finish up until they are at least 27 or 28 years old. (It is unfortunate that relatively few of these students, and still fewer of their parents, ever think of the plain fact that the education and professional training they are getting during the approximate 8 years they spend in college and university costs that institution far more than they themselves ever pay.)

High school preparation for the career of ichthyologist is important. After 30 years of teaching young ichthyologists I rank the importance of high school subjects to a future ichthyologist as follows:

First and foremost—English. The man who cannot speak and write fluently, who cannot express himself clearly, simply, correctly, and with the utmost precision, is badly handicapped. Over half of the undergraduate students working for the bachelor's degree in our universities today cannot speak or write good, clear, precise English. Many are verbose without being precise or clear. Many spell so poorly that often neither the reader nor they themselves are quite sure what words they are trying to use. It has been found that the student who can express his exact meaning clearly, logically, and briefly is the man who will go farthest, because clarity of thought is closely tied up with clarity and precision in writing and speaking. Take plenty of English courses, including grammar, composition, and literature—for only through reading good writing does one learn how to write. Do not neglect public speaking.

Second—foreign languages. These are the things about which the average American high school student heading for ichthyology or some other science is usually most poorly advised. Do not take Spanish, even though that is probably the most popular language in U.S. high schools today! If you live close to the Mexican border and already know some Spanish, fine! Let it go at that until later, for in most scientific fields other languages are far more important to know (first German, second French, third Russian), and you should be learning at least two of these in high school, or you will regret it later. You will eventually have to prove your proficiency in at least two foreign languages to get a Ph.D. or Sc.D., and those usually required are (1) German, and (2) French. For the average ichthyologist, both of them are still of greater importance than Russian. I strongly advise either German or French (2 years of one of them) in high school. If you can, take 2 years of each! You'll be glad of it later.

[Note on Latin— Few students nowadays take Latin. Why study a dead language? There is something to that question, but not what most people think. I strongly advise taking 1 year of Latin, if it is available, in high school. I do not do so because of Latin terminology in science, although that has some importance, but because about half of most scientific writing is based on

Latin words. I advise taking a year of Latin primarily because of the great push a knowledge of elementary Latin gives a student in the precision and clarity with which he can express himself in English. A great deal of English is based upon Latin. In the days when Latin was commonly taken by high school students heading for college, most schoolteachers knew some Latin, and it showed up clearly in the preciseness of the English which they taught to their pupils. Relatively few elementary and high school teachers of English today seem to have had any Latin, and it shows up clearly in the English they teach. Take a year of Latin, if you can, and it is best to do so before you take German or French.]

Third—mathematics. Mathematics is basic and essential in all sciences, even biology. Make no mistake about that. Ichthyology is no exception. Many university departments of biology now require a knowledge of mathematics through calculus before you can get a B.A. degree in biology. They also require a great deal of chemistry, and you need all your math for that. Finish calculus in high school if you possibly can. Unless you do, you will be sorry after you enter college.

Fourth—science subjects. Do not waste time on "general science" in high school, if that is offered. Do not waste time on a high school biology course, for as a biology student in college you will get all that later, and better, probably with no lost time in repeating. Biology in high school is not needed by a student headed for college biology. But you must take a "science" (usually) in high school. Take either physics or chemistry. My strong suggestion is physics. It is basic to chemistry, of which, in any event, you will be forced to take a good deal in college. Physics will prepare you in many ways for chemistry.

Fifth—other subjects. You are offered a good many choices of elective courses in high school, but if you really want to be an ichthyologist you will concentrate on the stiffer high school courses I have already recommended, and carefully avoid easier elective courses that will take up time necessary for the basic courses which you must have. If courses not mentioned above are required in high school, and you have any choice, select from the following, and in the order I suggest: (1) geography, (2) world history or European history in preference to courses solely in American history, (3) weather and climate, which is sometimes given in high school, (4) sociology, (5) wood-working or metalworking ("shop"), which will stand you in good stead in ichthyology, although I don't recommend spending much time on them.

That is a stiff high school program, but if you really want to be an ichthyologist, I advise you to stick as close to it as you can. And don't spend too much time on your fishes while in high school or your record will be too poor to enter college! And you never will be an ichthyologist, or any other kind of a scientist.

(To be concluded in a later issue of THH.)

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water, and finally dumping the contents and starting all over with the contents of another filter.

Pen-Pals in Hungary

Q. We would like very much to get in correspondence with young aquarium hobbyists in the United States. We can read and write in English. Do you know anyone who would be interested in writing us?

Pongraz Imre and Roszner András,
Budapest, XIV
Népszabad út 25.III.I
Hungary, Europe

A. Probably any number of our readers would be interested, so I have included your full address above. Good luck!

Sex changes

Q. I. You said in the January issue of THH that a female livebearer which has been transformed into a male is rarely capable of fertilizing a brood. William T. Innes, in a book, stated that while

they are carried by the female, baby swordtails are neuter. When they are born, all are females. When they mature, it is possible for a normal female to revert to a male and perform perfectly as such. Such sex reverses are known in various livebearers, as well as in bubble-nest builders.

2. Recently I bought a mature pair of pearl gouramis. I have no trouble with Pearl gourami pair.



them in the community tank, but I have tried to condition them on small pieces of ground beef, dry food, and baby fishes. The only food they will accept is the dry food. Can you suggest a better food on which to condition them?

3. I bought a male paradise fish in a store that sells tropical fishes. It had long, flowing fins. When I fed it meat a couple of days later, it looked as if it was carrying eggs. Is this normal in a male?

4. I have noticed from time to time that female bettas sometimes have long, flowing fins but retain a body depth like a female betta. Is this normal?

5. Recently it was my good fortune to acquire a nice pair of pothole cutfish, *Hoplosternum* species. What kind of food is best for them?

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6. Will backswimmers hurt fish? Are they good food for them?

Joseph Barry,
Ft. Myers Beach, Fla.
A. I. I hate to cross swords with my old friend Dr. Jones, but I would amend something he says. I quote part of a sentence: "... when delivered they are invariably females." I would say that when delivered they invariably appear to be females. Then, when they become mature, the males assume external male characteristics and become functional. Of course, it can happen that a female has a hormonal imbalance and begins to take on the appearance of a male. In almost all cases such a fish becomes an apparatus, but not functional, male.

2. They would probably do very well on frozen live food, if you could not get them living foods.

3. Paradise fish are gluttons, and it probably enjoyed the meat you were feeding it to such an extent that its belly swelled with the amount it consumed.

4. If the body depth persists long after the fish has eaten, it might be a male with droopy.

5. Have you tried live tubifex worms? They love them.

6. My first experience with a backswimmer was when I was very young. I caught one in my hand and when I tried to examine it, I got a wasp-like sting I will never forget. Maybe they would never do

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this to a fish, but just the same I would steer clear of them.

Variety of questions

Q. I. I have six red devils that are 5 to 6 months old and haven't turned red.

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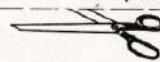
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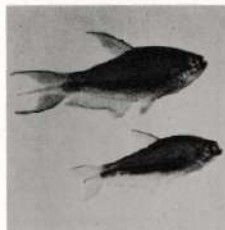
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Is this normal? At what age do they color up?

2. I am trying to spawn emperor tetras, and after 6 months have only two fry. Can you use a rod trap with the breeders? Or marbles?



A pair of emperor tetras.

3. Where do hydra come from? How are they controlled?

4. My 55-gallon tank had brown algae forming. I was told, "Not enough light." I gave the tank 10 hours of light instead of its usual 7. Now hair algae has formed on the plants. What can I do to control these pests? Will mollies or Otocinclus eat it?

5. Will Vallisneria and sagittaria grow in the same tank? If not, how about if they are planted in separate planters?

6. What type of fluorescent tubes are best to use for good plant growth besides Gro-Lux?

Lloyd Wyker,
North East, Md.

A. I. There is a great amount of vari-

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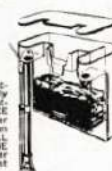
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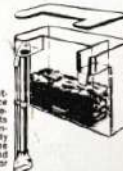
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2. Emperors spawn like the usual tetras and must be taken out of the breeding tank after they have finished spawning. I fail to see what advantage a rod trap or bed of marbles would be with this type of spawner.

3. Hydra, which look like plants but are actually animals, are very easily introduced with live food or plants. Eradicating them is a real problem. The addition of 5 grains of ammonium nitrate to each gallon of water is supposed to do the trick.

4. If I had my choice between brown and hair algae, my choice would be hair algae every time. Mollies and Otocinclus will nibble at it and keep it down to some extent. Try using these fishes, and get a balance in your lighting somewhere between 7 and 10 hours.

5. It has been stated for a long time by some that cullineria and sagittaria will not grow in the same tank. Others brand this as pure and utter nonsense. I think that if you do as you suggest, that is use separate planters, you stand a fairly good chance of joining the ranks of the hobbyists who say that it can be done.

6. Before the advent of the Gro-Lux tubes, the ones we advised as the most natural-looking as well as the best plant growers were the so-called "warm white" tubes.

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ability in red devils, and some of them never turn red. At the age you claim yours are, they would be red in most cases if they were going to be.

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keep the gravel clean. It doesn't seem to be doing its job. There is still dirt and decay on my aquarium gravel. What should I do?

2. I have a fluorescent light hanging 6 inches above my aquarium. How long should I keep it on?

Rainer Mueller, Chicago, Ill.

A. 1. Just because you may have seen the name "Miracle" on your undergravel filter, don't expect miracles to begin happening as soon as you put it to work. An undergravel filter will do its work and even do it so well that it seems to be doing miracles, but there are a few basic and fundamental rules that you must observe. If you overfeed your fish or overstock your aquarium, don't expect your undergravel filter to perform some sort of magic which will correct your mistakes, especially if you keep on making them. Make it

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a rule never to crowd more than 1 1/2 inches of total fish length in each gallon of water, and never feed your fish so heavily that there is any food left after 10 minutes.

2. You do not give the wattage of the fluorescent tube, and I do not know what location your aquarium is in. If your aquarium gets a good amount of sunlight, very little artificial lighting is needed. If on the other hand your tank gets little or no sunlight, you may have to keep the light on for about 8 hours a day. Your plants will tell you if conditions are right. If they are healthy and grow well, conditions are good. If they are overgrown with algae, there is too much light. If they grow poorly, there is not enough light.

Cichlids and goldfish
Q: My wife and I maintain several 30- to 25-gallon tanks. One tank contains 5 black-chinned cichlids, each about 4 to

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A black-chinned cichlid.

4 1/2 inches long (all females), two oscars 1 1/2 to 1 3/4 inches long, and 9 plain and fancy goldfish (initially 13). The breeder of the cichlids said these fishes were compatible, and that the temperature range for them is about 72 to 74° F., which doesn't seem to bother the goldfish. At higher temperatures (to 80°), the tropicals pick on the goldfish. Two oscars died from being badly beaten and chewed, and two others from wounds and fungus. Presently, though, the goldfish are in apparently good health, are active, eat well, and seem to be content.

Each goldfish has lost at least 20% of its scales. One of them has less than 20% of his scales left. These fish spend summers in an outdoor pool. Barring illness, will they ever regain their scales? Is the temperature of the water or a little less OK for both types? The problem is now in its fourth month. We rarely see the tropicals attack, except when a goldfish is nearly dead, yet they must be attacking.

Jim Maier, Allen Park, Mich.

A. Your tank would be filled to capacity even without the goldfish. Add to this nine goldfish, and you have a tank that is badly overcrowded. At the rather low temperature (for the tropicals) of 72°-74° F., the goldfish would be comfortable, but your oscars and black-chinned cichlids would be cold and disinclined to get into any battle. But when the temperature is brought up to around 80° F., the story is reversed, and the tropicals regard the goldfish, which would tend to become groggy at this point, as something to tear up and eat. Keep

your fish at their proper temperature, and don't ever expect them to even put up with temperatures Mother Nature never intended for them. Scails don't grow back very readily, and your damaged fish may not get them back at all. The oscars are so small that they are probably not contributing to the damage. Of course, like the black-chinned cichlids, they require temperatures of 74° to 78° F.

Paint and the aquarium
Q: We are thinking of painting the room in which the fish tanks are; what precautions should I take with the fish?
Stanley J. Kaczynski, Fall River, Mass.

A. You do not need to move the tanks. Just seal them; take out the heaters and air lines that go in, and remove any filters that hang on the tank frame. Then put a sheet of Saran Wrap on the tanks so that it overlaps the edges, and seal the wrap down.

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Guppy Corner
By Paul Hahnel

Fin-nipping female
Q. Recently I bought a pair of veiltail guppies and put them in a 10-gallon tank with two *Corydoras* catfish and two dawn tetras, to separate them from my other stock. At first the female guppy would nip the tails of the two tetras, and then she started nipping the male, but I took this as just being playful. Then about 3 days later the male started lying on the bottom. I took him out and examined him and could find no sign of any illness. He would eat all right but hardly ever swam except to approach the female. Every time he approached her, she would fly away, and he would go back to the bottom. Do you think the female is frigid and this would cause his illness, or is the just nasty? I keep my tank well planted and aerated, and the lighting is adequate. The temperature is a constant 78-80° F., and the water has a neutral

pH. I feed a diet of the better-grade dry foods, salmon egg meal, crab meal, molly food (for a vegetable content), live tubifex worms, brine shrimp (adult and baby), and daphnia when available. I also feed chopped chicken liver, frozen daphnia, and mosquito larvae. I just can't find anything wrong; can you solve my problem?

John Loughran, Upper Darby, Pa.
Females quite often show this kind of behavior, especially if you move them into a tank which contains fish they have never seen before. And now the behavior of the male: lying on the bottom could be caused by the change of water. Sometimes, however, they get used to their

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new environment quickly. The behavior of your female is normal. A fertilized female will act that way and, if possible, should be kept without a male. The conditions and food you offer seem just perfect to me.

Babies not up to par

Q. I have read your book ALL ABOUT GUPPIES plus your writings in the TFM column and the booklet FANCY GUPPIES. I have been working with fancy guppies for the past 4 months, but my results are unfavorable. I buy good stock, but the fry don't come up to par with the parents. Why is this? I bought a pair of greens and got average tails (smaller than the parents) and no greens but all orange and blacks. Why?

I keep the water around pH 7.2, temperature about 78° F., and a filter

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and aeration going constantly. But I seem to lose the purchased pairs after about a month. At least once a month, I replace one-third of the water with seasoned water, and I use about 1 teaspoonful of aquarium salt per gallon. The fry live, but the parents die. Why does this happen? I try not to overfeed; I use a dry flake food and frozen daphnia. I have 10-gallon tanks planted with wacsrpice. Why am I having trouble?

A. Hogberg, Bridgeport, Conn.

A. The reason that you get different colored babies from the fish you buy is that the females may be from a different strain and carry different colors. It is also well known that changing fish from one environment to another might prove fatal. The fish get a shock being put into new water that probably has a different chemical makeup, thus forcing them to change their body chemistry. The change might damage the liver, kidneys, etc., and if this occurs the guppy often dies. A new hobbyist should not be discouraged after only 4 months; we all went through this in the beginning and learned by trial and error. Feeding only two types of fish food is the reason your young are so small; I use 25 different types.

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Salts From The Seven Seas



By Alfred A. Schultz

Q. I have a 25-gallon marine aquarium with a hydrometer reading of 1.023. I have all plastic plants in it. I want to know:

1. Every 4 weeks a brown slime forms on the plastic plants. What causes this?
2. What should I do to stop a salt growth forming on top of the glass cover on the aquarium?
3. For some unknown reason my dwarf sea horses live for only 4 to 5 weeks. Why?

Chris J. Knodel, Belford, N.J.

A. 1. This is an accumulation of fish

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7. waste. It can be washed off in fresh water. 2. This is a result of evaporation. The salt may be scraped off and put back in the tank.

3. Dwarf sea horses frequently starve. They normally eat hundreds of baby brine shrimp daily.

Q. Will the following combinations of fishes be OK in an 8-gallon tank which is filtered and has a heater?

1. Clown fish, three-spot demoiselle and a blue demoiselle?
2. Clown fish, three-spot demoiselle and a butterfly fish?
3. Clown fish, three-spot demoiselle and a rainbow wrasse?
4. Clown fish, three-spot demoiselle and a three-spot dascyllus?
5. 3 Clown fish and a small sea anemone?

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6. Clown fish, three-spot demoiselle and a neon goby?

A neon goby on a piece of brain coral.



7. Any combination of the above, as long as there are never a pair?
8. Can a pair of dwarf seahorses be kept in a 1-gallon jar with the Little Miracle Filter?
9. How many saltwater fishes can be kept in a 20-gallon tank?
10. Can a small moray eel be kept in a 5-gallon tank?
11. Would live brine shrimp caught directly from the Great Salt Lake be satisfactory food for all of the above?

If the above setup works I'll try to convert all four of my freshwater aquaria to salt water because I've had them only 2 years and find the fishes boring unless you breed them, and I don't have enough tanks. I enjoy your column very much and also the whole magazine. I think it is a good hobby for young people and teenagers (I'm 15), and about 20 other teenagers that I know think so too.

Fred Seeley, Tooele, Utah

- A. I. OK.
2. OK.
3. OK.
4. No. They are very likely to fight among themselves.
5. OK.
6. OK.
7. Yes, excluding the three-spot dascyllus.
8. Yes.
9. No.
10. No.
11. Yes, but wash them off thoroughly under the tap before you feed them.

One tank is all that is needed to breed a pair of freshwater fish. It's fun; haven't you ever tried it? Thank you for your welcome words of praise, but your views are a bit too short-sighted; the hobby of fish-keeping seems like a fine thing to you at 15 and under. However, a good many of us who were hobbyists at 15 find later that we are "hooked" for life!

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The ever-popular *Pelmatochromis kribensis*. Photo by G.J.M. Timmerman.

One of the favorite small cichlids...

Pelmatochromis kribensis

BY RUDOLF ZUKAL,
BRNO,
Czechoslovakia

This fish belongs to the smaller representatives of the huge family Cichlidae. In its home waters of tropical West Africa, in the Niger and Kribi Deltas it attains a length of 4 inches, but in our aquaria it seldom exceeds 3½ inches.

The species *P. subocellatus* and *P. kribensis* often get confused. They are two separate species, even if their colors and body structure are very similar. According to Boulenger, the genus *Pelmatochromis* has 37 species. After being revised by T. Regan, the amount of species was reduced to 20-22 species. *P. subocellatus* arrived in Europe about the year 1907, but was not bred successfully and not imported again, soon disappearing from the tanks of hobbyists. In the year 1945 similar fish were imported to Europe and

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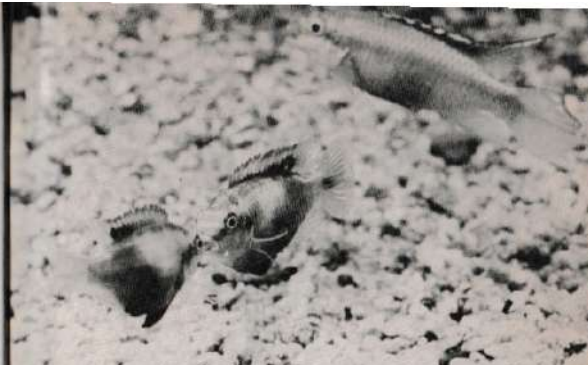
Dr. Axelrod took four years to write this book with the assistance of Mr. Vorderwinkler. He journeyed 135,000 miles from Pakistan to Hawaii to Australia to the Fiji and Hawaiian Islands, through Japan and Ceylon, Singapore and Hong Kong, as well as Europe, the West Indies and South America, not to mention Africa and the Mediterranean, to collect and photograph fishes which have never appeared on a printed page before!

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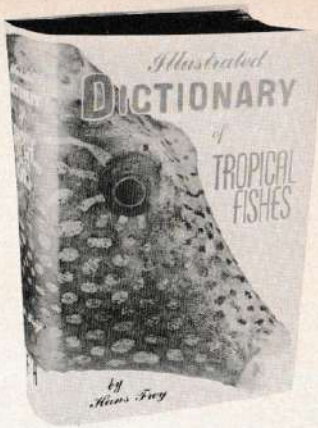
Two of the author's female *kribensis* battle for the attention of the male. The male watches, but remains neutral. Photo by R. Zukal.

identified as *P. kribensis*, after the name of the river Kribi in Cameroon. Dieter Vogt thought the newcomer to be a subspecies of *P. subocellatus*, but this does not seem to be the case, because as far back as the year 1911 *P. kribensis* was known and described by Boulenger.

The male and the victorious female inspect the flowerpot in which they will spawn. Photo by R. Zukal.



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The female deposits the first of the eggs while the male waits patiently for his chance to fertilize them. Photo by R. Zukal.

P. kribensis is one of the most popular of Cichlids because of its gorgeous coloring, modest size, and peaceful behavior. The fish can be kept in the community tank at a temperature of 74 to 78° F., and its only disadvantage is that it is fond of digging into the bottom. This can be limited somewhat

The female's ovispator tube can be seen quite clearly in this photo. Photo by R. Zukal.



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A pair of kribensis examine the flowerpot placed in their tank for them to spawn in. Photo by R. Zukal.

by the use of a coarse gravel bottom. It is also advisable to provide retreats in which the fish can hide. Keeping a number of pairs together in the same tank is not advised, because this would lead to battles with their own kind.

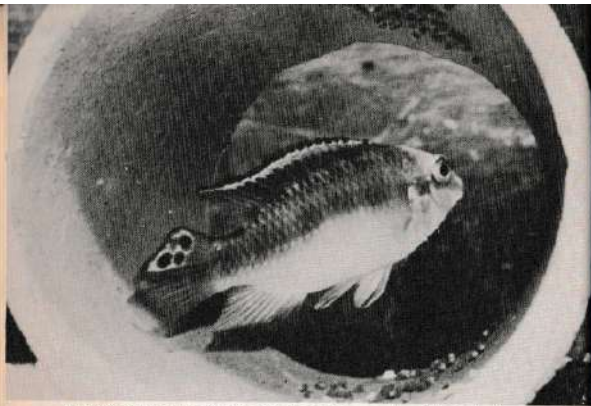
The male is more slender, bigger, and has a broader forehead than the female. On the edge of his dorsal fin there is a silvery, gold-gleaming stripe which ends in the point. In the upper part of the tail fin there are 1-5 round dark spots which are edged in light yellow. The fins are violet in color.

The female has a large wine-red patch on the sides of her body, is more deeply colored, and has red ventral fins. Younger specimens do not show this full coloration.

These fish require a good-sized, well-planted tank, with possibilities for hiding. The water should not be hard. They are peaceful, friendly, and very active fish. They take all sorts of live foods, as well as algae.

For spawning, I gave them a 10-gallon aquarium with a gravel bottom, planted with some *Echinodorus* species in the background. The highly valued flowerpot for spawning was also placed within. I used normal tap water, which in Brno is 8-12 DH. The temperature was raised to 80° F. and held there.

Much courting seemed to be going on, but no eggs were laid. The pair even visited the flowerpot together, but a spawning was not forthcoming.



The male moves in to fertilize the eggs. Some of the eggs have fallen to the bottom where they will probably not be fertilized. Photo by R. Zukal.

Biting or other rough courting tactics indulged in by many cichlids was not observed. All I could notice was that the female tried to dig pits in several parts of the tank. Although this female was ready for spawning, I did not know what else to do and added another female. In a few seconds, all Hades

In order to spray his sperms directly onto the eggs, the male must turn upside down just as the female did. Photo by R. Zukal.



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Tropical Fish Hobbyist



These two young kribias grew up in the tank in which this photo was taken. They started at eggs on the flowerpot in the background! Photo by R. Zukal.

broke loose. With widespread fins and red bellies, the females attacked each other. They curved their bodies before each other with gleaming colors, especially the golden edge of the dorsal fin. While the females were thus engaged, the male swam by as if not wanting to have any part of the argument. The female that was originally in the tank emerged victorious. The battle lasted about a half hour before I noticed that there might be serious consequences and fished out the defeated female. Then, sure enough, the male began very vigorous courtship at once, and both fish swam into the flowerpot. After some cleaning of the intended spawning site, the first attempts to lay eggs were made by the female. The first eggs dropped to the bottom, but the subsequent eggs hung from the flowerpot's surface. The female turned on her back, pressed her belly to the flowerpot and, while the male waited, released her eggs. As soon as she had laid a few eggs, she left the flowerpot. Her breeding tube could be seen easily. And now it was the male's turn: he flipped over on his back exactly as the female had done, touched the spawning site with his mouth, then rubbed the flowerpot with his belly and fertilized the eggs.

Caring for the brown-colored eggs is a duty which the female usually regards as solely her own. Sometimes parental care is exercised by both the male and the female, but in most cases it is better to remove the male as soon as he has fertilized the eggs. The fry become freeswimming after 3 to

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May, 1966

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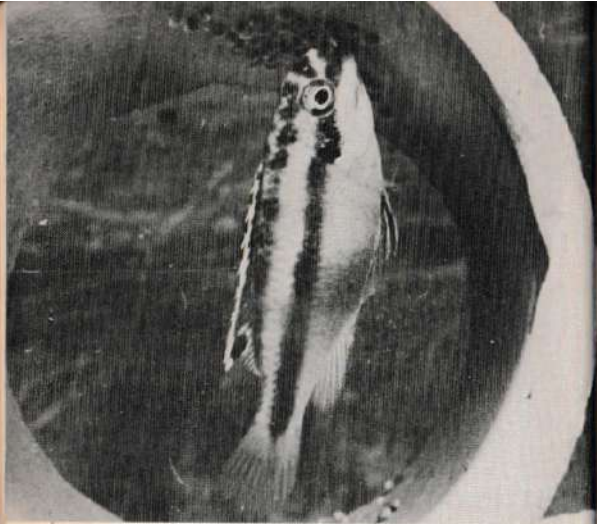
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The female keeps the fertilized eggs clean by mouthing and fanning them. Photo by R. Zukal.

4 days and must be provided with infusoria or the finest size of prepared foods, those made especially for the fry of egglayers. They swim in a swarm near their mother.

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