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PIRANHAS, by Harold Schultz. 50c from your dealer or direct from T.F.H.

The many species of characid fishes making up the group popularly known as piranhas have a solid and devoted following within the aquarium hobby. Beginners and experts alike at some time or other determine to find out for themselves whether piranhas are the dangerous marauders legend has made them or whether they are merely suffering from the exaggerations of folklore.

Harold Schultz, famous Brazilian scientist-explorer, knows the truth about piranhas and tells it in his fascinating account of the life habits of these enduringly popular aquarium specimens. But part and parcel of the value of *Piranhas* is the book's masterful presentation of both text and photographs that enable hobbyists to tell the many piranha species apart, to separate the relatively dangerous fishes from the completely harmless ones. Vividly illustrated with 18 full-color natural photographs in addition to its many informative black and white illustrations, *Piranhas* gives a comprehensive view of the subfamily Serrasalminae from all angles of importance to hobbyists.

TROPICAL FISH HOBBYIST

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| The piranha has always fascinated hobbyists throughout the world. Not many of us have kept them, however, for they are an extremely temperamental and voracious unless they are kept in a tank that is well out of reach of inquisitive hands. One thing is sure, they have quite definite personalities. There have been enough tales of delicate ladies passing out while watching a piranha attack a swordtail that it seems that at least a few are true. And why should they be true? Such a spectacle is nature at her roughest. It is not for the faint of heart, but it never leaves one shuddering and saying "So what?" Our cover this month, showing the business end of a piranha, is particularly dramatic. For more about the piranha, including an account of its spawning behavior, turn to the article beginning on page 5. Photo by Dr. Herbert R. Axelrod. | |
| EXOTIC TROPICAL FISHES SUPPLEMENTS Pages 23 to 36, 53 to 56. These pages are prepared for easy removal and inserted to fit into the Lancelot Edition of EXOTIC TROPICAL FISHES. | |

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EDITORIALLY . . .

Sometimes I get a rather disturbing letter that reads something like this: "How come you are referring to the Australian rainbow fish as *Nematocentrus*, when up to a short time ago your magazine and books called them *Melanotaenia*?" The only thing I can say is that time marches on, and our scientists are constantly working, not to make things more complicated, but to make them simpler and, above all, to make them more correct. For many years our familiar platy was placed in its own genus, *Platypoecilus*. Then it was decided that *Platypoecilus* was so similar taxonomically to the swordtail, *Xiphophorus*, that it did not deserve its own genus, and it was bunched under the generic name *Xiphophorus*. Sometimes we are plagued with two spellings: the snakehead genus, of which there are many species, is generally referred to as *Ophicephalus*, but we frequently see it as *Ophiocephalus*. Then there is the fortunately-rare instance of a fish with two scientific names, like *Macrodon traira* and *Hoplias malabaricus*. Last time Dr. Martin Brittan, of the Sacramento State College in California, visited us I thought that this was the chance to get an expert opinion on which was right. "Bill," he told me, "it looks as if we're stuck with *Hoplias malabaricus*!" Harold Schultz has been calling them *Macrodon traira* for many years, and now I'll have to give them their proper name every time I translate his excellent articles. It isn't an easy job to keep abreast of all these changes, but we're going to be as correct as circumstances permit. Right now, I'm trying to track down a generic name one of the German magazines has hung on the black-banded sunfish, *Mesogonistius chaetodon*. They call it *Enneacanthus*, and I wonder who told them to!

William Vanderwinkler

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Large, strong teeth that are as sharp as razors make the piranha the most feared of all freshwater fishes. Photo by Harold Schultz.

Spawning Piranhas

BY EMANUEL LEDECKY
Cincinnati Aquarium

From time to time I have kept individuals of various piranhas in my personal collection. I wasn't particularly interested in Characids, but these fishes have earned a special interest. While I was in Europe I heard tales of these cannibals and later, by selling a prize specimen from my collection, I met an interesting student of animal behavior. She is now my wife, but as they say, that's another story.

Each of my piranhas I kept isolated in fairly small containers, as is the usual procedure among private aquarists, to prevent them from damaging or killing one another. The fish were striking, good topics of conversation and winners at fish shows, but under these circumstances I learned little more about them than that they were shy and very skittish, panicking at the slightest provocation and taking much longer than other fish to adjust to new conditions. These reputedly ravenous creatures wouldn't even eat at first, and a shelter of some sort proved helpful in settling them. Breeding and more

extensive behavior studies were then impossible, and many questions I had remained, for the time being, unanswered. I hoped that some day I would have a chance to observe them under more favorable conditions.

The opportunity came when I became Assistant Curator of the Cincinnati Zoo and was put in charge of the Fleischman Memorial Aquarium. There, in a 300-gallon unlandscaped tank, were three adult piranhas. These had been a gift from the Shedd Aquarium and were probably the result of an earlier successful spawning described by Bill Braker (2). For reasons given in his article, Braker had identified them as *Serrasalminus spilopleura*, and the accompanying photographs matched the Cincinnati fish exactly. The taxonomy of this group, however, is very confusing. As recently as 1963, Dr. Gery (4), an authority on the subfamily Serrasalminae, writes: "Malgré une littérature abondante sur les 'Piranhas' (genre *Serrasalminus* Lacepede), riche surtout en détails de seconde main sur leur comportement qualifié de sanguinaire, rien n'est connu de leur biologie, et, plus curieux encore, bien peu de leur systématique."* Since descriptions and figures of *S. spilopleura* vary in some important works (1, 3), I will refer to our fish as *Serrasalminus* species until an investigation of the dentition and other anatomical features establishes their identity.

Two of the three fish were about seven inches in total length, the third about an inch shorter. Their unpaired fins were almost nonexistent. Heavy scar tissue was present at the base of these fins, indicating repeated damage and regeneration. The fish themselves, however, were solid and alert and kept large, watchful eyes on their tank-mates as they carefully maneuvered to attack or avoid attack.

In an attempt to give them greater security and improve the appearance of the tank, driftwood and aquatic plants were added. Even so, some fin-nipping went on. I decided to add other fishes to serve as distraction, but one does not simply add fish to a tank of piranhas. Up to this point live fishes, mostly bluegills and goldfish, were part of their diet and were quickly attacked and devoured. Guppies were totally ignored, apparently too small and beneath the piranhas' notice. A large firemouth cichlid was then tried. He was certainly no coward and presented a magnificent spectacle as he defended his chosen territory, charging head on at the piranhas with his crimson gills flaring. One day a piranha met his charge and bit off his nose!

At the time I happened to have a surplus of *Tilapia sparrmanii* and tried these alert and cagey fish next. These did well and all survived. More valuable fish such as *Exodon paradoxus* and *Chirodon axelrodi* were then added. The community thrived and the strategy worked to some extent. The piranhas

* "In spite of abundant literature on the 'Piranhas,' genus *Serrasalminus* Lacepede, rich principally in secondary details about their bloody behavior, nothing is known of their biology, and, still more strangely, very little of their taxonomy."

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The bucktoothed fish, *Exodon paradoxus*, was found by the author to be a suitable tankmate for the piranhas at the Cincinnati Zoo. Photo by Dr. Herbert R. Axelrod.

still chewed on each other occasionally, but their fins began to regenerate. Strips of beef heart became the main part of their diet.

During the winter the water temperature fluctuated from 67° to 76° F. The fish occasionally chased each other and were observed to assume a tight head-to-tail position, circling as if attempting to bite each other's tails. This behavior in itself is not unusual, as head-to-tail circling, tail slapping, and similar displays are seen in a number of different species, even among fish of the same sex or those too young to breed. Soon I suspected that something more was happening. The color of all the piranhas deepened. Instead of silver, the body color became smoky gray and the fins almost black. The circling became more frequent; sometimes all three fish participated.

On February 11, while making the last check after closing the aquarium, I noticed two piranhas, one smaller than the other, side by side in midwater. Finding two piranhas so close together and not helping themselves to a piece of their neighbor is most unusual. As I watched, the fish slowly rose by beats of their pectoral fins. Just beneath some floating water sprite they tilted sharply upward, came close together, trembled, and parted. A cascade of eggs was falling through the water and was almost instantaneously devoured by the *Exodon* and the parents themselves. In my excitement, I tried to run through the locked door of the service area . . . then I scooped out some water in an attempt to salvage some of the eggs. What a disappointment. Not an egg visible in the tray. I stood watching the tank, but the disturbance had frightened the breeders and it was all over. Sadly, I examined the tray again.

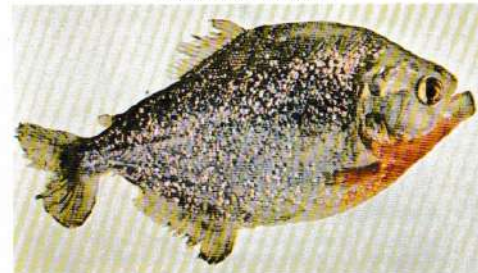


The Cincinnati Zoo's breeding male piranha has fairly complete finnage. The anterior of the anal fin shows longer rays as in the males of *Melnynis*. Photo by Dr. Herbert R. Axelrod.

Perhaps just one . . . then I noticed little translucent globules on the roots of the floating water sprite. There they were in numbers, clustered like plums on a tree!

Methylene blue and an air stone were added to the tray and our hard water cut one-half with snow water. In 24 hours embryos could be seen

The female is larger and slightly deeper at mid-body than the male. The prominent dark lateral spots that are well defined on juveniles specimens are restricted in the adult to the dorsal quarter and are obscured almost totally by dark ground color and reflective scales. Photo by Dr. Herbert R. Axelrod.





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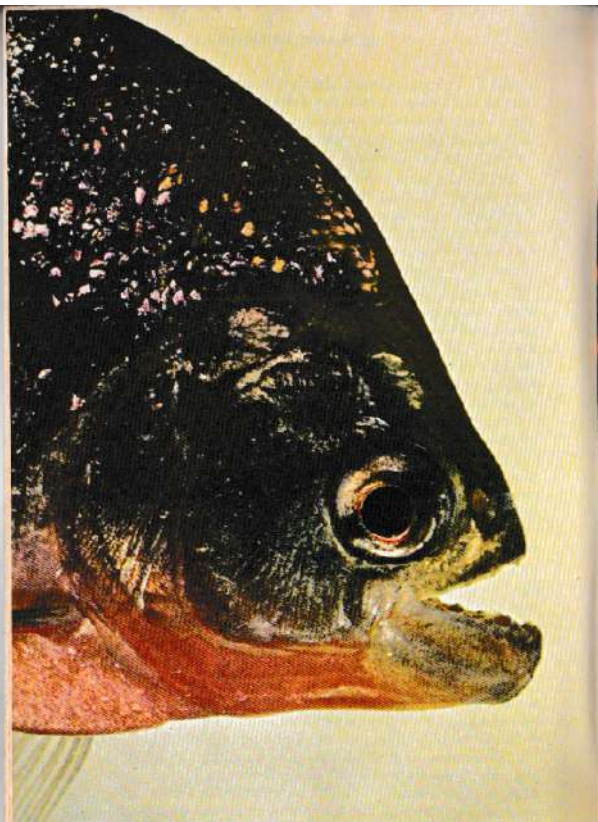
moving in the eggs, and a day later they began to hatch. The young hung belly up in a horizontal position by a thread extending from their yolk sacs. They became quite active; by nine days after hatching, when almost half an inch long, all fry were free-swimming. From the beginning, brine shrimp were eaten, and in only a few days young white worms were eagerly accepted.

Optimistically preparing the tank for another spawning, I added a large water hyacinth with long, trailing roots and a piece of unwound rope. In this way I hoped to provide larger, more suitable substrata for the eggs. A month to the day after the first spawning, on March 11, the piranhas again spawned. Both the water hyacinth and the rope were ignored, the eggs being deposited on the roots of a water sprite, with some adhering to a piece of driftwood.

Since I had all the young piranhas I could use and more than I could properly house, these eggs were left undisturbed. There appeared to be no guarding on the part of the parents, and in a short time the eggs were gone. I was now fairly certain that the spawning pattern differed from previously published accounts: eggs were scattered near the surface with no site preparation, no subsequent guarding, and an interval of about a month between spawnings. I was so certain that I predicted (quite accurately) the next spawning time and date. On April 10 the third spawning took place, again in the late afternoon. This part of my prediction proved true. I had, however, attempted to be too authoritative with only limited experience. In this and some subsequent spawnings the water hyacinth roots were used, and the fish prepared the site by chewing some of the rootlets off, forming sort of a hollow near the center.

Observation of many spawning runs did not clarify the sexes of the fish. Even though I placed my wife at another angle to the spawning pair and we both watched intently, neither of us could tell which fish actually released the eggs. The motion, the speed, and the close proximity of the vent areas made it impossible. The smaller fish was darker, more angular, and had less fin damage. During spawning its anal fin overlapped the vent of the larger fish in a manner similar to that of a male *Metynnus*. It was assumed, then, that the smaller fish was the male.

Later spawnings themselves differed from the one I first observed. The pair not only turned upward but sometimes continued into a loop with a half roll, spraying eggs when completely upside down. Sometimes, between runs, the female mouthed the plants containing the eggs. She was also observed to stand in a vertical position while jerking her head. The male would then come alongside. A number of times the fish broke from this position, circled each other, and then returned. Eventually they came side by side and repeated the trembling loop-roll. Eggs that did not stick were eaten by both parents and other fish. Those that attached were not bothered, although both parents mouthed them. On one occasion a large bunch of *Myriophyllum* was anchored



Detail of the head of the male piranha. The teeth are partially concealed by the skin of the jaws. Photo by Dr. Herbert R. Axelrod.



At 4 months of age, the young were about 3½ inches long. Their juvenile spots were still clearly defined. Photo by Dr. Herbert R. Axelrod.

in the tank. This and the other plants were unharmed until the fish went into their pre-spawning display. The *Myriophyllum* was then cut off and floated to the surface, and the piranhas spawned on it.

The pattern first described was never seen again and was probably very atypical. Many more eggs were attached when the parents prepared the site and, surprisingly, the male guarded them. He remained slightly below the nest with his head toward it, driving away intruders and at intervals executing a swimming movement which sent fresh water toward the eggs.

The fourth spawning was about a month later, on May 17. Then, on May 28, or 11 days later, the fish were observed in pre-spawning activities. Later the male was observed standing in a typical "on guard" position. Sure enough, closer inspection of the plants revealed eggs. Subsequent spawns were at intervals of 24, 12, and 7 days. What happened to my carefully worked out schedule? There are several possibilities of which the most probable is that the male spawned with the second female, though definite proof is lacking.

On August 13, the known breeding female was wounded during courtship. A short time later she was floating head down at the surface, still alive but with the whole rear portion of her body chewed off. The poor creature was sacrificed and preserved and since that time no further spawning has occurred. The remaining piranhas have lately appeared to have darker coloration, and I have high hopes that once again our aquarium will boast a breeding pair of these beauties.



The author's drawing showing the action in one of the piranha spawnings at the Cincinnati Zoo.

REFERENCES

1. Arnold, P. J., and Ahl, E. (1936). *Fremdlandische Susswasserfische*. Brunswick, W. Germany: Gustav Wenzel.
2. Braker, W. F. (1960). Tank Talk. *The Aquarium*, (29): 6-10.
3. Eigenmann, C. H. (192). The Serrasalminae and Mylinae. *Carnegie Museum Annals*, (9): 226-272.
4. Gery, J. (1963). Contributions a l'etude des Poissons Characoides—27: Systematique et Evolution de quelques Piranhas (*Serrasalmo*). *Vie et Milieu*, (14): 597-617.



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All suited up, the authors are ready for a dive. Photo by Jimmy Smith.

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BY BOB AND DON MORRIS

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were barely discernible through the murky depths, we were completely unprepared for the exotic marine life so brilliantly displayed in the crystal clear waters of Hawaii.

Although we both became interested in skin diving about ten years ago as a means to further our studies in marine biology at the University of Delaware, we didn't

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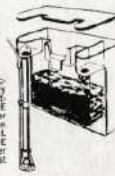
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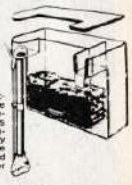
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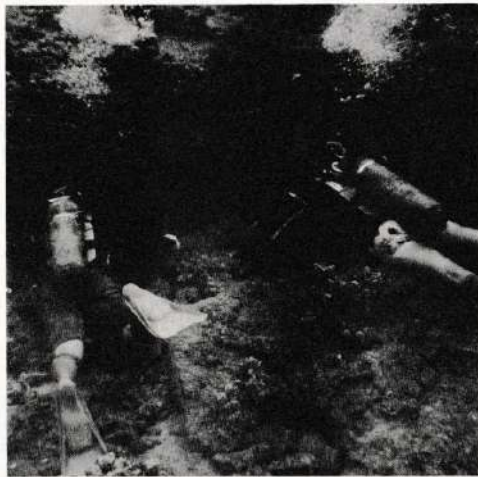
get to see Hawaiian marine fishes in their native waters until six years ago, at which time we went to the University of Hawaii for advanced courses in our chosen field. Our first job in the Islands was diving for one of the glass-bottom boat attractions, pointing out and explaining the unknown underwater world to the tourists.

Besides the diving activities included in the routine of our jobs, we spent a lot of our spare time exploring Hawaiian waters with other enthusiasts, and we learned to enjoy

the excitement of spear fishing. However, one of our friends spent all of his time poking around with hand nets for the smaller and more colorful fishes, which he claimed would live in an aquarium. We found it odd that anyone should bother with the smaller fishes and neglect the thrills of chasing larger fishes, but we were struck by the brilliance of the specimens he collected and determined to try out a salt water aquarium stocked with small species we could collect ourselves.

We acquired several tanks of our

Underwater shelves are alive with small colorful fishes that make some of the best aquarium species, but probing around in them can be dangerous. Photo by Jimmy Smith.



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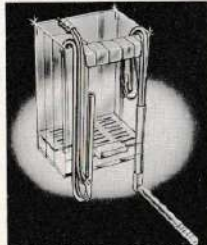
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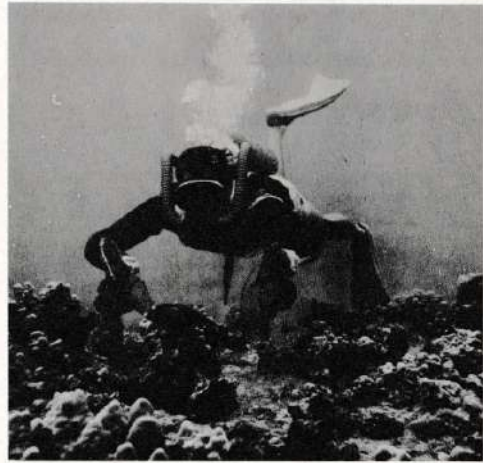
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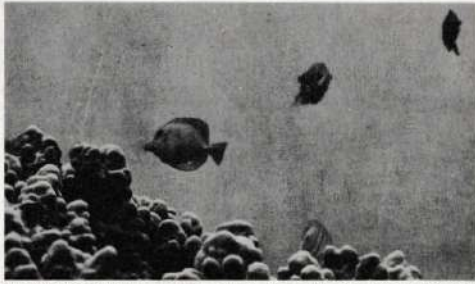
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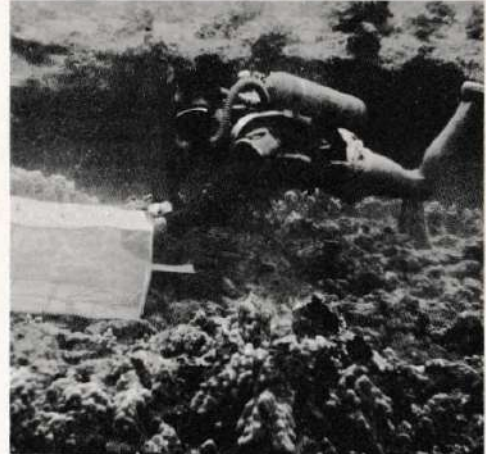
This is the technique the brothers use to catch many specimens. Two nets are maneuvered so as to sandwich the fish between them. Whichever way the fish turns, he runs into a net. Photo by Jimmy Smith.

own and experimented with this new hobby. Soon we received several requests from the mainland for Hawaiian fish. Thus began our interest in exporting, and it was at that time, about two years ago, that our business, Marine Tropicals, Hawaii, came into being. By trial and error we perfected packing the fish in oxygenated plastic bags and shipping them by air. As our exporting business grew, our basement became filled with tanks. People began to call the house to see the fish and purchase them. We soon found

it necessary to open a small shop on Keeaumoku Street to take care of the increased retail interest and to obtain greatly needed space for our exporting business. At present we not only offer local tropical fishes but also supplement our stock with exotic Far Eastern imports. Our fishes can be found across the mainland, in Canada, and even in such faraway places as Switzerland. All was not as easy as we had anticipated, for many of the beautiful fishes proved difficult to collect. Through a closer study of their



This yellow tang (above) seems to be teasing, "Come and catch me." And indeed the brothers did. Here (below) the same tang is about to be emptied into a receiving bucket aboard the boat. Photos by Jimmy Smith.



A "fish satchel" made of wire mesh enables the brothers to stay under for longer periods of time, catching greater numbers of fish with each dive and "storing" them until they are ready to surface. Photo by Jimmy Smith.

habits, we eventually discovered methods of capturing each fish.

Three to four hours are spent underwater in a typical day's collecting activities. As each specimen is taken it is placed in a special cage which we call "the fish satchel". By using this "fish satchel" we can keep our catch close at hand while investigating more distant areas, eliminating the need to surface after each fish is caught. Surfacing with the fish is sometimes a tricky business if the fish has been caught at a considerable depth. In certain cases,

special decompression tables must be followed to prevent the fish from getting the "bends". A decompression chamber, designed by Marineland of the Pacific, was sent to us in order that we might collect specimens from extremely deep water.

After getting our day's collection of fishes, the most difficult and exacting part of the trip begins—getting the catch home alive. Traveling forty miles over bumpy roads with water sloshing back and forth is not particularly conducive to adapting a

fish to its new surroundings. It is usually well into the evening before the day's catch is secured in its new home, even though we might have started out at five o'clock in the morning.

During the course of our collecting we occasionally see fishes that are unusual or rare. Two of the rarest specimens which we have captured were a pair of Longnose Hawk Fish that were living in a tree of black coral at a depth of over one hundred feet. These proved to be an *Oxy-*

rrhites species, only the fifth and sixth specimens captured in the world, and the first from Hawaii.

Other fishes, not so rare, but unusual in appearance, make nice specimens for the home aquarium. One such fish is the *Lau-aihi-ni-nukunuku-ooe*, or Longnose Butterfly Fish. The Hawaiian translation for this name is "the unpredictable fish with a long snout." It does have a very long snout and proves to be most unpredictable when pursued. The popular *Humu-humu nuku-nuku*

The fish satchel is light and is particularly easy to move from one spot to another under the buoyant salt water. Photo by Jimmy Smith.



The contents of the fish satchel are emptied into the large plastic receiving bucket aboard the collecting boat. Photo by Jimmy Smith.

a-pua is also quite unusual in appearance. The translation of this name means "the trigger fish with the snout of a pig or the grunt of a pig". When captured or chased this fish makes a grunting sound by beating its fins on the side of its body.

Our greatest enemy is not the more vicious underwater creatures such as sharks or eels, as many people are led to believe, but the weather and its effects on the ocean. When the water is dirty or a high

surf condition exists, collecting is virtually impossible.

One of the newer aspects of our business is salt-water displays. We found that a tank of Sea Horses or other interesting fish can be very tranquilizing; they are especially useful in doctors' reception rooms. Our displays can also be found in several bars in Waikiki.

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Back on land, the brothers store their catch in large traps like this one. Photo by Jimmy Smith.

it with several inches of medium-coarse beach sand. Add salt water, and let the tank run for about one week. Add only healthy fish to your tank and keep them small—two to three inches. Do not overcrowd your aquarium. Four two-inch specimens to ten gallons of water is enough. Do not overfeed them; one feeding a day is sufficient. Overfeeding leads to pollution of the water.

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The chunky, compact body form and metallic coloring of *Geophagus jurupari* gives the fish a misleading look of hardness. Photo by Dr. Herbert R. Axelrod.

"Horseface" . . .

Tough Looking but Touchy

BY STELLA SWAIN RICO

Geophagus jurupari are interesting, comical-looking fellows to keep. In one dealer's tank I saw them labeled "HORSEFACES," as good a nickname as any I have ever heard to describe their rather heavy bodies and extremely large, horse-like heads! Their coloring does not appear outstanding when they are young. As they grow, however, it intensifies considerably, and few fishes can compare with their brilliant, metallic-blue, iridescent body flecks; flecked, flaring, pointed fins that are always erect; and rainbowish eyes that are lined with vivid orange and shiny purple with a background of horizontal vivid blue lines.

When they are young, you cannot tell a male from a female *jurupari*, but at an age of 3 or 4 months, the male's fins get long lacy points on them, whereas the female's fins remain rounded. *Jurupari* also have 3 thick iridescent black bands running vertically down their sides, and these bands are much more prominent in the female.

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January, 1966

I would not advise attempting to keep jurupari in an aquarium smaller than 25 gallons, because if they are well cared for they can eventually grow to 9 or more inches in length! However, jurupari are usually welcome additions in large tanks, because in addition to being attractive, they do not annoy plants and are one of the best scavengers for the aquarium. They literally sift the sand from their mouths out through their gills in a constant search for any edible tidbit. But you have to be a bit cautious if you keep jurupari in a community tank that is somewhat crowded or contains smaller fishes. Under these conditions, they can be quite quarrelsome and mean. Even though they do not actually bite, they might worry a tankmate to death with their constant chasing.

I have never read, nor have I ever heard anywhere that *Geophagus jurupari* are delicate. Knowing that most cichlids are sturdy and robust fishes, and since jurupari look particularly strong with their stocky bodies and large heads, I assumed that they would not be touchy when I first got some. Sheer error.

Most of us know that barbs need much more oxygen than most other tropical fishes, and now I know that the same holds true for jurupari. I had a powerful pump serving a 32-gallon aquarium and 50-gallon aquarium. There were about 40 fishes altogether in the tanks. There were jurupari, discus, tin foil barbs, upside-down catfish, clown loaches, angelfish, scats, red-fin sharks, and a few others.

Cichlasoma meeki, the firemouth cichlid, shares jurupari's ability to sift gravel through its gills. The difference is that jurupari is constantly doing it, making him a far better scavenger.



43

Tropical Fish Hobbyist



The tin foil barb, *Barbodes schwanenfeldii*. Like most barbs, requires abundant oxygen.
Photo by Dr. Herbert R. Axelrod.

All of the fishes were in excellent condition. I had raised the jurupari and tin foil barbs from small babies; the tin foil barbs were about 8 inches long, and the jurupari were about 5 inches long. One night the pump quit. When I arose in the morning, the only dead fish in both tanks were the barbs and the jurupari. The so-called delicate fishes, such as discus, were not even aware that anything was wrong! Since then, I have noticed that whenever my filter slows down, my jurupari are *always* the first to go to the surface for air.

My sister-in-law had the reflector off of her aquarium for a couple of days. (It was being repaired.) Naturally the tank was dim without lights. When she put the newly repaired reflector back on, without thinking, she switched the light on immediately. Of course, such sudden bright light is not good for ANY fish, but the only fish that suffered really badly were her jurupari; they flopped over and died in a matter of seconds.

Recently I had in my 32-gallon aquarium: two clarias catfish, two ornate bichirs, and six young jurupari. I had had the jurupari for over 3 months, and they were growing like weeds. At the time, they were about 3 inches long.

Then five of them very abruptly developed something that is still a complete mystery to me. They acquired just a suggestion of transparency. Their countless metal-like scales appeared to be outlined in rich red, from the inside. It took about a week for four of them to die. I managed to cure one with tetracycline. The remaining one of the original six never developed the condition. None of the jurupari's tankmates were at all affected by the disease.

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Medium-size clown loaches can live with all but the very large, very vicious tropicals. In a tank of jurupari size fishes this fellow protects himself effectively with spines he can erect at will under his eyes. Photo by H. Hansen.

Breeding jurupari is really an accomplishment. They are very fussy when selecting mates, and usually they don't do it in the average hobbyist's tank. (I have seen proven mated pairs priced at \$50 in dealers' tanks!) The eggs are laid and then covered with fine sand, if there is any in the aquarium. When the eggs hatch, the fry are taken into the female's mouth. It is best, at this time, to remove the male. During the 14 days or so that the female holds the fry in her mouth, she might refuse to eat. The young fry can be fed newly hatched brine shrimp, tiny sifted daphnia, or the specially prepared commercial fry-foods.

Despite their sensitivity and the difficulty encountered in breeding them, jurupari are attractive and interesting enough to rate a place in any large community tank that contains medium to large fishes. They are available either tank-raised or imported from their native Brazil. Usually the imported wild specimens are much more colorful.



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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., 243 Commission Avenue, Jersey City, N. J. 07302.

Peaceful bettas

Q. I have witnessed on two occasions where persons breeding bettas have raised the entire spawn without separating the males, bringing them to full maturity in the same tank. One was a dealer who raised most of his own stock. He had numerous aquaria full of adult male bettas and had never separated them, but he could not explain the lack of the traditional pugnacity among the males. The other was a hobbyist who claims it is always possible to keep males together if they are raised from fry to maturity in the same tank. Both stressed that if the males are never separated they are congenial. However, if they are separated for one moment and then returned, fighting will begin. It was extremely beautiful to see a 20-gallon tank full of male bettas. My question is, are there other accounts of this occurrence, and

has this ever been tested to any extent? Since this evidently is not normal, what conditions might prevail to cause this phenomenon?

Richard K. Grubb,
Columbus, Ohio

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A. Somebody once said: "Every day we learn a little bit." Today, reading your letter, I have learned a lot. I have heard of males being kept together, but a fish tranquilizer had been added to the water. To the best of my knowledge, this drug is not available to the hobbyist. The secret of success, perhaps, is that there were no females. This gave the fish nothing to fight for. With females present, there is constant competition not only for the females themselves but for a free space in which to build a nest and raise a family. I have also seen this with other scrappy fish: put together two and you have a fight; put together 20 and you have peace. A fish taken out and then put back immediately becomes a stranger and is treated as such.

Outdoor pool

Q. I have recently set an outdoor pond and would like to know if discus can be kept in it. The pool is about 4 feet in diameter, is about a foot deep and

probably contains 50 or more gallons of water. Right now I have tap water in it but hope I can let rain water gradually fill it. In our area the temperature seldom drops below 32°F., and I am

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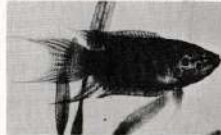
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going to put a heating unit in the pond. I now have fancy-tailed guppies, angel-fish, rams, and a red-tailed shark in the pond. However, I hope to add a couple of paradise fish, dwarf gouramis, and some catfish for the purpose of eating the algae. I now have some water hyacinth but hope to add several bushy plants.

Frank Moore, Cocoa, Fla.

A. In the first place, I would never trust a lovely and expensive fish like a discus to the rigors of an outside pool, even if that pool is located in Florida. Even with a heating unit a pool would get mighty chilly at the surface in cool weather. And one foot deep? You can't hold much warmth with the water that shallow. On the other hand, the water would get very warm with the sun heating down. If you want to keep some kind of fish in it, I can only recommend the paradise fish which

A paradise fish, *Macropodus opercularis*.



you propose to get. Then you must remember that paradise fish are "tough babies" and would make life miserable for any other fish you put them with.

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White worms

Q. I am trying to raise a culture of white worms. It is too hot to keep them outside, so I keep them in the refrigerator which never goes above 40° F. Almost every day I look at the culture there is a

thin layer of white mold on the top. I feed the worms bread soaked in milk. Could you tell me what I'm doing wrong?

Tony Ford, Salem, Ore.

A. The temperature you are giving the worms seems a bit low, but if they are multiplying at a satisfactory rate they have probably adapted to your conditions. As for the mold, it isn't doing any harm to the culture and can be lifted out in the places where it gets thick. If it makes you feel uneasy, try using a fresh box of loam and a starter culture once more. This time, try feeding with bread just soaked in water. You will probably find that it works just as well, and there is much less mold.

White convict cichlids

Q. I have finally been able to purchase some white convict cichlids. After I was sure that I had a pair, I put them in a 15-gallon aquarium, and, as I had expected, I ran into some problems.

1. After the eggs were laid the female kept the male away, because he would eat the eggs when he got near enough. In the April '65 issue of TFIH there was an article on these cichlids and it said that both fish cared for the eggs. Can you tell me why mine didn't?

2. Even the female didn't guard the eggs very well. She would swim all around the tank and go back to the eggs every now and then. When she would

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go back she would eat quite a few of the eggs that weren't fungused. Why was this?

3. What causes eggs to fungus?
4. What can I do to prevent the eggs from fungusing?

5. I sure wish you would put a picture of yourself in your column or in "Editorially." I'm sure the other hobbyists would like this.

6. Do you think that the reason I had so much trouble with my fish was because it was the first spawning? Maybe I'll have better luck with my next.

Jimmy Finger,
Beaumont, Texas

A. I. Cichlids are the most unpredictable critters in the fish world. The best that anyone can say when describing their

breeding habits is that about 90% will do such and such a thing. What the other 10% will do is anyone's guess.

2. See what I mean?
3. Fungus will usually take hold on dead tissue. An unfertilized egg is a good spot for this.

4. There are some fungicides which if used in the proper manner will hold down fungus growth to a minimum. Of course, there is a dividing line. On one side the fungicide is ineffective; on the other it is too strong and kills the fish it is supposed to save. What you must do is to watch the dosage carefully, and follow the manufacturer's instructions to the letter.

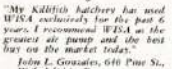
5. I am just as sure that many hobbyists would prefer to have me leave the picture out and use the space for more questions

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and answers. What I am really afraid of is that readers who looked at my ugly mug would not only stop reading what I write but throw away the whole magazine.

6. You have hit the nail exactly on the mitten. Once your fish are more accustomed to each other, you'll probably do better.

Sex change
Q. A few weeks ago I bought EXOTIC TROPICAL FISHES. In reading this book I came to page M-80.00. In the first paragraph it says: "The sexes in fishes are always separate, and in a few cases in which it has been studied, sex determination is genetic and determined by the spermatozoa, as in most other vertebrates; but unlike most other vertebrates, the genetic sex may sometimes alter spontaneously, particularly in livebearers. When this occurs, the transformation is apparently always

from female to male." I know this means that there is such a thing as sex change, but I just don't understand how it happens. I have asked my mom and she doesn't understand it either.

Kay Hiellinski,
Los Angeles, Calif.

A. I'll answer you in what I hope will be simple language: sex changes are not at all uncommon among livebearing fishes. A female will start her life as such, possibly even having a few batches of young. Then there is an upset, probably in her hormone balance, which stops her reproductive organs from functioning and, amazingly enough, causes her to take on male external characteristics and make her look like a full-fledged male. Such fishes, look like, and even act like, males, but here's the catch: these "males" are seldom functional sexually. If you ever put one in with a female and she has

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young, it's a safe bet that she was previously impregnated elsewhere.

Meet "Ancient Angie"

Q. I must say that I enjoy your magazine, and find it very helpful and educational. But I wonder if I may make one suggestion? I see that occasionally you have a *Meet the Hobbyist* feature. Have you considered doing a feature about Mr. August M. Roth, the editor and publisher of "Aquatic Life and the Aquatic World?" He has put out this magazine for about 50 years and is now 84 years old and very active in this work. He helped popularize the betta in the United States. I do not know Mr. Roth personally but he seems to be a remarkable person.

Nadine Mikuska,
Gould City, Mich.

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A. I'm one up on you, Nadine; Angie Roth and I are old friends, and I was writing and translating for him before TFF even existed! I knew that he was a long ways from being a youngster, but I never suspected that he was that old. The only thing I can wish him is a toast once given to me by a Scottish friend: "Lang may your han reek, Angie!" (Translated - "Long may your chimney smoke.") Maybe some day a *Meet the Hobbyist* article on Angie will appear.

Dead angelfish fry
Q. One day I noticed that my angelfish were spawning on a large broad leaf. They laid about 100 eggs. The fish were too busy chasing the other fish away to fan the eggs. So I took the leaf out and put it in another tank filled with water from the tank where the fish had

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spawned. In a few days the fry were free-swimming. I fed them well with infusoria, and boiled egg yolk. I was just about to start them on newly hatched brine shrimp when they suddenly died. Why did this happen?

William Weedmark,
St. John's, Nfld., Canada



An angelfish with its eggs.

A. One of two things probably happened: either you starved them to death with what you thought was a heavy culture of infusoria and was actually a culture with practically no infusoria and a lot of bacteria, or, and this is more likely, you killed them with kindness by overfeeding with the egg yolk and letting it foul.

Fish terms

Q. I am just starting the hobby of collecting tropical fish. I've received two issues of TFF so far. I find them interesting for the most part, but I have found many words I don't understand and which are not listed in the dictionary. Do you think you could print a dictionary of words used in talking or reading about tropical fish. I think it would sell very well, especially to beginners.

John Noble,
Roselle, Ill.

A. We could, John, and as a matter of fact we have. **DICTIONARY OF TROPICAL FISHES** is an excellent reference book for any fish hobbyist. Not only is it very useful for a beginner, but many advanced hobbyists find it to be an invaluable help. The price is \$7.95, and the book is well worth it.

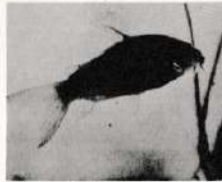
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Corydoras aeneus

Q. I am interested in breeding *Corydoras aeneus* and would appreciate it if you would answer these questions:



Corydoras aeneus.

1. Could you tell me some of the

differences between the male and female of this fish?

2. What should the pH be if these were to breed?

3. How long will it take for the eggs to hatch if the temperature is 80°?

4. Should the parents be removed after the eggs are laid?

Frank Massarelli,
Perry, N.Y.

A. 1. The best but by no means perfect means of sexing is to look down at them from above. The female is a little rounder and wider than the male, besides usually being a bit longer.

2. Neutral to slightly alkaline is best; it is more important, however, to give them the water to which they have become accustomed.

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3. Four to 7 days.

4. The parents are of not great advantage while the eggs are hatching, and removing them eliminates altogether the remote possibility that they would eat them.

Marbled hatchets

Q. I have a great interest in marbled hatchets, *Carnegiella strigata*, and am determined to breed them, but unfortunately I do not know a lot about them, and information is hard to come by. I wonder if you could help me with a few points:

1. What type of water is found in their natural habitat? What is its color and temperature?

2. Is the water moving or static?

3. Type of water bed: rocky, reedy, peaty, gravel, etc.?

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4. Their known favorite foods?

D. Godfrey,
London, England

A. 1. The water in which they occur is neutral to slightly acid. It is slightly brown in color and about 78° F. in temperature.

2. They prefer quiet waters which are almost static.

3. It makes little difference what the bottom is like, because they spend most of their time near the surface. They like open stretches, which rules out reeds.

4. Practically all the food they get in their native waters is comprised of insects that fly over the water's surface. Living crustaceans such as daphnia or brine shrimp are a reasonable substitute, but wingless fruit flies come about closest to the real thing.

Guppy Corner



By Paul Hahnel

Light and temperature

Q. I have read about you in some of my tropical fish magazines and wondered if you could help me by giving me some information on how light and temperature affect the activity of guppies. I am doing a science project on this, and would appreciate any information you would send me.

Warren Nadler,
Bronx, N.Y.

A. We all know that light is an essential factor in life. Without solar energy there would be no life on this planet; no grass, no trees, nothing. To duplicate this solar energy in my guppy tanks I use a 25-watt incandescent bulb for a 10-gallon tank and leave it on for 8 to 10 hours a day. The rays of different types of light (fluorescent, sunlight, etc.) affect the reproduction of the guppy; plants are also affected. The

suppy fares best in water 75° to 78° F. If the temperature rises above 80° or falls below 72°, it will adversely affect the suppy's eating habits, life cycle, and reproduction. Higher temperatures within the safe range increase the fishes' metabolism, causing them to grow faster, give birth more often, become more active, and die at an earlier age. Lower temperatures within the safe range have opposite effects.

Guppy Fry in Fishbowl

Q. I breed the blue delta tail and Hahnel guppies. My females multiply kind of fast. I keep the babies in a quart fishbowl, where I feed them three times

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daily. This pollutes the water, in which there are about 34 babies.

1. In the small fishbowl do I feed them too much in one day?

2. How many times must I clean the bowl each week?

3. Do you think the bowl I keep them in is too small?

4. If the bowl is too small, what size should I use?

5. How long will it take them to grow to good-size guppies?

Tim Verity,
Palos Heights, Ill.

A. 1, 2, 3, & 4. Keeping guppies, even babies, in a bowl is out of the question. Keep the babies in a good-sized tank which has a filter and an airstone.

5. Given the best of conditions, which so far you definitely have not, they should grow to full size in about 6 months.

Show tips

Q. Two friends and I have recently found a common interest in tropical fish, guppies in particular. We will all be high school sophomores next year and are contemplating entering some guppies in a large local competition. We would appreciate it very much if you would answer the following questions:

1. What color background would you suggest for an orange veiltail, a green one, blue, purple?

2. Would you suggest putting differ-

ent color types in the same tank for show purposes?

3. If there are 3 to 5 males shown, how many females (if any) should be with them?

Gregory McCoy,
Claremont, Calif.

A. 1. If you want a background for your tank, a piece of black cardboard fastened to the outside of the tank will do nicely.

2. Fish of different colors should prove interesting. Check the show rules though.

3. It will be sufficient to have 15 to 20 males; if you do not have that many I suggest that you use an even amount of males and females. The show rules may solve your problem by specifying how many fish and the sex ratio you must show.

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*Salts From
The Seven Seas*



By Alfred A. Schultz

- Q. 1.** How many dwarf seahorses can you put in a 10-gallon tank?
2. I got my brine shrimp at a nearby petshop. My seahorses are not big enough to eat the large sized shrimp, so would you please tell me how to strain the shrimp so I may use just the small ones?
3. Is there anything I can feed the seahorses besides shrimp? I have a large supply, but they seem to need something besides just shrimp.
4. Will these fish be all right in the seahorse tank? A pair of pipefish, a pair of miniature hermit crabs, and a dwarf star fish?
5. Can rocks, such as are used in a freshwater tank, be put in salt water?
6. Are there any plants you may put in a saltwater tank?
7. Is it true that seahorses can change to any color they wish, if there is something in the tank that color?

**Tony Nugent,
Los Angeles, Calif.**

- A. 1.** 60.
2. Instead of buying the adult brine shrimp, buy the dry eggs and hatch babies out yourself.
3. No, except perhaps an occasional meal of live daphnia. Feed this sparingly, so that they are eaten before they die in the salt water.
4. Yes to the pipefish and the hermit

- crabs, but no to the starfish.
5. I do not suggest it.
6. No.
7. I have never seen it happen.

Q. 1. I am planning a saltwater aquarium using the following equipment:

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- 2.** Can a vacuum-type of automatic sand cleaner be used in a saltwater aquarium?
3. Can sea horses be kept with the other saltwater fish?
4. My sea horse doesn't seem to be eating. I keep him in a 1-gallon fish bowl with aeration and filter. I feed brine shrimp. Could you suggest anything?

**David Epstein,
New Hyde Park, N.Y.**

- A. 1.** Fine.
2. Yes.
3. No.

4. Your sea horse is living under conditions which are too crowded. Give him a bigger home.

Q. 1. I have been reading other questions that you have gotten asking about salt water from the sea. You suggested putting it in a container and letting it set for 30 days. I would like to know how long you could keep it in such a container without the water diluting or something?

2. Can you keep a pair of *Dascyllus aruanus*, a pair of clownfish and a pair of Puerto Rican butterfly fish in a 15-gallon tank together?

3. Which of the above fish can you keep with sea anemones?

**Chuck Johnson,
Norwalk, Calif.**



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- A. 1.** If well sealed, the water will keep indefinitely.
2. The only fly in the ointment here is that the *Dascyllus aruanus* will doubtless stage battles with each other.
3. Clownfish.



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A male albino variatus. These fish should prove to be popular with a great many hobbyists. Photo by Dr. Herbert R. Axelrod.

An Albino Variatus

BY WILLIAM VORDERWINKLER

For a long time, there has been a profusion of albino fish species offered to the hobbyist who is fond of this type of fish. In many cases we see more albinos than the original colored variety. The paradise fish is an example of this: we see very few of the original colored fish, possibly because the albinos are a little more peaceful than the originals. Some years ago, someone came out with an albino *Pristella riddlei*, and it sold so well that many hobbyists nowadays have never seen the original fish, a very pretty little tetra. Among the livebearing species, we have albino mollies, albino guppies, and albino swordtails.



Pseudotropheus auratus. Above, a male in his dark breeding colors. Photo by W. Hoppe. Below, the two sexes, indistinguishable when not in breeding condition. Photo by Dr. Herbert R. Axelrod.



It's Been Done!
Breeding *Pseudotropheus auratus*

BY WILLIAM VORDEWINKLER

We got a letter from Bernard M. France, of the *Association Française des Aquariophiles* in Vitry, France, which gives us some interesting information about the gorgeous new beauties, *Pseudotropheus*

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auratus which have been found in Lake Nyasa. Mr. France tells us that the upper fish shown on page 5 of the October issue of this magazine is a female, and the lower one a male. He has bred the species twice, and members of the Nancy branch of the Association have done it three times.

He uses distilled water, to which he adds 1½% of sea water. This gives him a hardness of 9 degrees and a total mineral content of 565. The temperature he uses is 78 to 82°F.

The fish are mouthbreeders, and it must be remembered here that we are dealing with a species that is very apt to forget its cavalierly good manners and commit mayhem with little or no provocation. It is, therefore, an excellent idea to remove the male as soon as it can be seen that the female has her mouth full of eggs. He is no longer needed; his work is done, and he might want to keep on spawning, with disastrous results for the female if she has no more eggs to lay.

With typical mouthbreeder devotion, she carries the eggs and young in her mouth for 23 to 26 days. When the youngsters finally leave her mouth, they are about 3/4 of an inch in length. Recommended feeding is with newly hatched brine shrimp and Grindal worms.

Next on the breeding agenda, Mr. France tells us, is *Pseudotropheus zebra*. As with the other *Pseudotropheus* species, great care must be taken to prevent injuries, and a glass separator is a real necessity to get the prospective parents accustomed to each other.

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The Smithsonian Institution and T.F.H. Publications, Inc., are pleased to announce the publication of a reprint, including the color plates, of the Philippine Bureau of Science's three Monographs on Philippine fishes: No. 1, Jordan and Richardson's Checklist, 1909; No. 23, A. W. Herre's Gobiids, 1927; and No. 24, Monticola's Poeciliatridae, 1917. These rare historical works are available in a clothbound volume for \$5.50.

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Orders for these books, accompanied by remittance (postpaid) should be addressed to:

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With new species like the one above showing up from Lake Nyasa all the time, breeders will have plenty of work on their hands. Photo by W. Hoppe.

Mr. France tells us very optimistically that he is expecting to get a shipment, not only from Lake Nyasa but also from Lakes Albert and Tanganyika. The cichlids from these places, he says, almost invariably like vegetable matter as well as the usual cichlid diet, and to put them into a nicely planted tank would be courting disaster for the plants. As for the new fish, it is even a very ticklish job to put a fish back into a tank where he had been kept more or less successfully before. The ones in there invariably treat him as a stranger, and he must quickly defend himself or come to grief.

Of course we are, so far, dealing with wild-caught fish, and it is fervently hoped that in a few generations of aquarium life these roughnecks will tend to become a bit more docile and accept captivity a little more gracefully. What may be tried now is something that has worked out with other scrappy customers: put together two or three and there's a brannigan of sorts, but put together a dozen or more, and they're all so busy watching each other for suspicious moves that they have no time to fight! This sounds as if it might contain a moral of some kind, doesn't it?

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