

TROPICAL FISH

HOBBYIST

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Contents

Vol. IX, July, 1961 (#65) No. 11

A Journey into Cardinal Tetra Country...	5
Better Business...	16
Report From Hong Kong...	18
The Gulf-South Bitter...	27
I'd Like to Tangle by the Tailings...	29
The Autumn Leaves Dull Post...	35
Mr. Windsor...	35
Lough, Clawn, Lough...	43
Photographic Record of the Spawning of the Paradise Fish Macropodus opercularis...	47
Another Ace from Singapore's...	53
Top Breeder...	53
The American Hobby in Czechoslovakia...	57
Obituary—Mr. Henry Huber...	75
Neofundulus rockii in Nature...	81

FEATURES

Notes From All Over: p. 41, Hall Call: p. 63; Ovary Cancer: p. 65; Sells from the Seven Seas: p. 77.

COVER

This color photo of the Marine Clown Fish, Amphiprion percula, was taken by Dr. Axelrod in natural sunlight, using a Polaroid camera.


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EDITORIALY . . .

I wish I could answer individually all of the nice letters and "get-well" cards which you, my good friends, have sent me in the past weeks while I was laid up recuperating from a gastrectomy. Very likely it was the lift I got from this mail that made it possible for me to leave the hospital a week after the operation and be back at work in three weeks, feeling fine. It is a highly gratifying thing to know that so many people with whom I have never come in personal contact and who know me only from my writings think enough of me to take the trouble to write and wish me well. Anyone who has lost his confidence in the human race should see the huge stack of mail I got from people who have never met me, but who told me how concerned they were over my health and how anxious they were to hear that all was well. The world in general may be in a rather sad state, but there's nothing the matter with the world of aquarium hobbyists! I'm proud to be a fellow hobbyist in a hobby which includes so many kind, considerate, friendly folks! Thank you one and all, you wonderful people!


One thing I have learned, a fellow can't go ahead and say things like "See you in Niagara Falls!" with as much confidence as I have been doing. I look forward to the annual TIFAS conventions with as much eagerness as anyone, and it was a real disappointment to be forced to miss this year's. So I'll say "See you next year in Cleveland, if my health lets me!"

William Vorderwinkler



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JAMES L. SMITH

J.L.S. QUINN'S MANAGER



Charodon axelrodi, the Cardinal Tetra. We returned from our expedition with 50,000 of these beauties. Photo by E. Koloff.

A Journey into Cardinal Tetra Country

BY H. W. SCHWARTZ, MANAUS, BRAZIL
Photos by the author

When the Rio Negro recedes, the time for fish-catching begins. The shallower the water, the better the prospects of a good catch. I had determined this year to look for new fishing grounds; those I had been using were too far away. The only way to get the fish back was to fly them to Manaus. Quantities were limited because the plane was an amphibious Catalina which made once-a-week passenger flights.

Cardinal Tetras are not caught in the main stream but in the tributaries or, better yet, in the tributary sources which are usually located in the swamplands.

There was assigned to me a guide who was supposed to know the surrounding territory above the Rio Branco like the back of his hand, and who

answered to the sweet name of "Bonbon." It turned out that he was not really such a sweet boy, but a badly raised fellow who showed up drunk at departure time. As I had already advanced him most of his wages for pocket money, I was forced to make the best of a bad bargain and keep him aboard.

In this manner we left Manaus at 8 o'clock in the evening. I was not worried, because I knew the river as far as the Rio Branco reasonably well without having to depend on the services of my drunken guide. We had two boats, one of them 28 feet long with a 12-HP inboard motor, and the other 23 feet long and driven by an Archimedes 12-HP outboard motor. Both were tied to each other at the sides. Behind us we towed a dugout 22 feet long; in this was a smaller one which could only be rowed. In these boats there were besides myself four men whose duties alternated between helmsman, cook, etc. We were equipped with several nets and 100 tin cans (old gasoline cans) to transport the fish. Besides this there were 6 wooden boxes with openings at the sides. These openings were covered with mesh netting, and the boxes were used to store fish in the river until ready for transportation.

I remained at the rudder until 3 A.M. and then awakened the guide to let him take over the rudder and permit me to get a little well-earned sleep. Just as I had dropped off, I was awakened by a crash of wood and a sharp jolt. The boats had run so far up on shore that water was coming over the stern of the smaller one. The guide had fallen asleep at the same time as the helmsman of the other boat, and the boats had run ashore in a bay. We were very fortunate in a way, because only a short distance further there were a great many jagged rocks jutting out of the water; if we had hit these our boats would have been shattered.

Our search for turtle eggs was not very productive!



Skinning a cayman, even a small one like this, is a tough job. The hide hanging on the pole in the background can be used for any number of purposes.

We continued after an hour's rest. 30 uneventful hours later we reached the mouth of the Rio Branco. It was a beautiful day, so we decided to call a halt, rest and bathe. We also took this opportunity to put out a 250-foot fish-line, to which 20 hooks were attached. We wanted to catch some fish and replenish our stores. For bait we caught some Piranhas. After about two hours we took a boat and retrieved the line and discovered that we had quite a large catch, much bigger than expected. First there appeared a half-grown Dorado, which was "quieted" by a powerful whack with a bush-knife and pulled into the boat. Then there followed two fully-grown Pirararas, a large Dogfish with a frightful set of jaws and pointed teeth, and a half-grown Piraiba about 175 lbs. in weight. As our catch was entirely too much for us, we gave the last to the inhabitants of a hut who had come inquisitively to the shore. The people were overjoyed and presented us with some fruits, bananas and yucca.



My crew with the various nets used in fish-catching.

Our headquarters at sunrise.



We caught a White Piraiba and couldn't eat it all, so we gave it to these caboclos (white Indians).

Searching for turtle eggs on an island in the river.



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These wild pigs weighed about 100 pounds apiece and provided us with plenty of food for the trip back to Manaus.

We were interested in getting another small boat, because our guide had told us that we could not reach the headwaters in our big boats. According to the natives we could definitely figure on getting a dugout in Carveiro, so Bonbon and I decided to take a motorboat to Carveiro, on the other side of the river. The trip took us 1 1/2 hours, for it is very wide here. After much inquiring, we succeeded in buying an almost new dugout for the ridiculous sum of 2000 cruzeiros (\$10). Pleased with our purchase, we bought some more fruits and left with the dugout in tow. When we got out in the open river, a wind came up and the high waves made the going very rough. The waves kept filling the boat with water and we had to keep bailing. The dugout behind us was already full of water, and I asked Bonbon to bail it out. He looked for his bush-knife under the seat and climbed into the other boat. When I asked him what the idea was, he said:

"So that I can cut the ropes if you and your boat begin to sink!" This made me feel uneasy, but I forced a smile and kept on my course in spite of the bad weather. It grew worse, but after three hours I succeeded in making the trip across. The rest of my crew thought we had drowned; the storm had been really bad.



Supper on the Rio Itu consisted of roast turtle.

Luiz Faz Tudo (Luiz Does Everything) catching Cardinal Tetras.



Our cook washing pots. The boxes and baskets are used to keep the fish in the river water until our departure.

The return trip with 50,000 Cardinal Tetras. The water is being changed.



After a conference with Bonbon we decided to travel to the Rio Itu. The mouth of the river was 40 hours travel upstream. The Rio Negro was receding and several sand-banks had put in an appearance, on which the fishermen had erected their huts and their "cavalho magro" ("skinny horse"); a frame on which the Pirarucu were dried. We headed for a sand-bank to try to find turtle eggs, but we could find only a few; someone had been there before us. Halfway to the Itu we found a settlement of fishermen, who signaled to us. I did not want to stop the motors, so I proceeded slowly and sent Bonbon there with the motorboat to ask what the people wanted. They wanted to give us Pirarucu and turtle eggs in exchange for sugar and coffee. Because there was only a small amount involved, I sent Bonbon to make the deal. He carelessly drove too close to our bow, causing the second boat to run into him. This boat, which was made of itauba wood, a wood which does not float, sank immediately, and on the surface there remained only the tank of the outboard motor. Luckily it was almost empty and provided a rescue buoy for both Bonbon and the boat. Bonbon had on a heavy woolen jacket which I had given him, and the weight of this almost caused him to drown. With much careful maneuvering we brought the boat back to the surface. The only things lost were 12 pounds of sugar and two pounds of coffee. But we all had a good fright.

After we had passed the mouth of the Demeni at night we missed our way and rode about 6 hours along the Ilha da Salvação, which seemed endless and totally uninhabited. When we had almost reached the very end, we saw lights and heard music. We headed there and found a fiesta in full swing. The owner of the place, an unusual man who called himself "Baby", welcomed us and invited us to the feast. When I found that there was nothing more to be had than rum and that there was a scarcity of attractive females, only a few civilized Indians, I preferred to go to sleep.

Next morning a young man, Maneco by name, declared himself willing to guide us to the Rio Itu, as he lived there in the Garapé do Aduja. So on the next day we finally arrived, after so many detours, at the Rio Itu. As the water was deep enough, we turned into the Garapé do Aduja and ascended as far as the depth of the water allowed. At the mouth of the Aduja we found on a sandbank a very primitive hut which was the property of a fisherman named Juao Maluco (Crazy John), who was in the act of skinning two caymans. We made his acquaintance and gave a gift to his five sons (the oldest was 6), who always accompanied him and his wife in their own little dugout. He gave us a turtle in return, which found its way into the pot then and there.

We set up camp on a very pretty peninsula and lost no time traveling up the little stream and inspecting the waters in search of Cardinal Tetras, which, according to Maneco, were supposed to be there in great numbers. He had not exaggerated. We found thousands of Cardinals. In addition, there were many Arowanas, *Carnegiella strigata*, *Hyphessobrycon rosaceus*, *Leporinus*



These wild pigs are worthy adversaries for any hunter. Large males can disembowel a man with one swipe of their long razor-sharp tusks.

species, *Metynnus* species, *Serrasalminus* species, Cichlids, Angelfish, Leaf-Fish, *Chilodus punctatus* (including the new species mentioned by Harald Schultz), and others.

The Cardinal Tetras live in quiet pools where there is a deep layer of decaying leaves on the bottom, in water which is hip-deep. They are never found in deeper spots. We caught them in hoop-nets and kept them in used gasoline cans.

One evening when we returned from fishing to our headquarters, we saw a 13-foot anaconda. We quickly cut some forked sticks and caught it. We took it back alive with us to Manaus.

The waters fell alarmingly, about 8 inches each day. In some places it was already necessary to push the dugouts over the shallow spots, and in one place where a sand-bank blocked our way entirely we had to carry them over the sand. After five days we had to speed up our return, lest we be stranded with our bigger boats. Several times we had to go overboard to push, so we again put out a net in the small stream in order to fill the remaining empty cans with fish. One day one of the men came running to tell us that he had spotted some wild pigs. Four men armed themselves with guns and ran into the woods. They killed three pigs with two shots. As each weighed about 100 pounds, our provisions for the return trip were assured.

The rest of the journey proved uneventful, and three days later we brought our entire load safely to Manaus.

Do you think you have troubles?



Betta splendens, the center of our story of intrigue and disaster.

Betta Business

BY LEE C. FINNERAN
Detroit, Michigan

For those of us who are inclined to believe that the life of a tropical fish dealer is one uninterrupted round of society meetings and money-counting, let me relate the little story of what happened to me about ten years ago. I wouldn't want anyone who is now entertaining ideas about starting his own business to be unduly discouraged because of my sad tale, because the rewards from running your own business are not to be measured entirely in dollars and cents. There is a lot of satisfaction to be derived from doing something completely on your own, especially in this day and age. On the other hand, my story will have served a good purpose if it is able to discourage even one person from the folly of giving up his regular occupation in favor of the

pursuit of what he considers to be the easy money of the tropical fish game.

Anyway, here's what happened. At the time that my adventure took place there was a great demand for Bettas in my area; good fish were selling for very good prices, with absolutely no danger of being stuck with unsold specimens. The time was ripe to make a killing, and I tried. As a matter of fact, that's all I could do for a full week: try. Phone calls to all of the known sources in town got me exactly nowhere. There were just no Fighting Fish to be had, at any price. Then, just as I was resigning myself to the acceptance of this fact, came what seemed to be a lucky break.

A friend called me and said that he could get over two hundred beautiful male Bettas from one of the Florida breeders near him. That was all I needed to hear. The deal was quickly made; I was to receive 212 males, packed individually in marmalade jars. The price? One dollar apiece. Everything ran smoothly up to this point, and I was already making plans for my profits. The rude awakening hadn't yet come to wake me from my dreams of glorious greenbacks. I had the fish; what could go wrong?

The airline very promptly told me what could go wrong. They would not accept the fish for shipment; there was a cold weather restriction on tropical fishes. However, they would ship the fish if I would sign a "No-Claim Release". This was to enable them to wag their fingers under my nose and say "I told you so" in the event that anything happened to the Bettas. Subsequent events proved to me that airline freight offices must come equipped with crystal balls. The release, and our desperate agreement to it, came in very handy for them later on.

My friend and I decided to make the best of the fading opportunity. He shipped the fish from the Florida airport while I waited for them at my end. We checked and rechecked the weather bureau in order to make sure that our gamble was not bucking really heavy odds. The night was cold and steadily getting colder; the wind got higher, carrying great gobs of snow. Finally, the plane came in. My relief was only temporary, however, because the plane couldn't land and had to be routed to an airport where better weather conditions prevailed.

The morning of the next day dawned bright and clear and brought with it a ray of hope in the form of a long distance telephone call from Philadelphia. The dealer at the other end of the line wanted to know if I were interested in buying some beautiful male Bettas at a dollar apiece, F.O.B. Philadelphia. He explained that he was able to make this generous offer because an airline had dumped them in a field near his town, considering them as perishable. He had done the airline a favor and taken them off its hands at twenty-five cents each; weren't we both lucky that some idiot in Michigan had tried to get a shipment through from Florida in the midst of a snowstorm?

I hung up the phone. There's a lot to do when you've decided to give up a thriving tropical fish business. I couldn't afford to waste any time.



Mr. Fung, owner of the Kowloon Aquarium. The papers inserted between the tanks are to insure privacy for the mating pairs of fish that will eventually be established in them.

Report From Hong Kong

BY HUSEIN ROFE
Hong Kong

The Chinese are known to have been fish fanciers for over a thousand years, and their Goldfish have been reaching the West for hundreds of years. Today there are more Chinese breeders concentrated in Hong Kong than in any other place. Although the industry is important, it is presently experiencing a depression for several reasons, chief of which is that it has become more difficult than ever to export fish to the United States, normally the largest outlet for Chinese-bred fishes. This difficulty is a result of the fact that goods exported from Hong Kong to the States require the presentation of a certificate certifying that the goods really do come from Hong Kong and are not re-exports of Red Chinese material. There has been so much abuse in the last few years that the certificates are no longer regarded as trustworthy and

18

techniques employed by these dealers in the care and treatment of some of our native species, many of which do not receive the proper handling in foreign tanks because of a lack of exact knowledge. There is much difficulty encountered in trying to spawn some of the Asiatic fishes, such as the *Bottas* and the *Labors*, and Dr. Axelrod felt that any hints that I might receive from the noted local breeders would prove to be well worth the effort.

Accordingly, our little party, consisting of Mr. Robert Ma, who looks after my fishes with great zeal, Mrs. Y. C. Ng Mak, and I, started out one Saturday morning to visit the most prominent local breeders in the New Territories, where most of them are located. The New Territories are actually a part of the Colony of Hong Kong, but they are located on the mainland, separated from the island of Hong Kong by a narrow strip of water. The New Territories extend right up to the border of Communist China; in fact, one of the most well known of our dealers lives but a few hundred yards from the border. Kowloon is the largest city on the mainland part of the Colony and faces the equally large city of Victoria, which is located on

Entrance to the smaller fish-house, where most of the small species are kept. The corrugated roofing safeguards the fish from the effects of the sun during the summer months, at the same time helping to retain the heat from the stove during the winter.



20

an embargo has been instituted, hitting the local businessmen hard. In the case of the fish industry, few of the exported fishes are indigenous to the Chinese mainland, but this trade suffers along with the others, and the choice of foreign markets has consequently become very restricted.

However, there are other markets, and a large number of the local people are aquarists, which facts have enabled the breeders to keep their heads above water. Unfortunately, many of these local hobbyists are interested only during certain seasons, buying fishes at the approach of warm weather and just leaving them to die when the cold spell sets in. This situation prevails because fishes are cheap, whereas equipment for their upkeep is expensive. Also, there has been since the war no Aquarium Society in the Colony to provide the hobbyists with the technique and know-how which would enable them to get more fun out of the hobby while affording greater protection for their pets. Meanwhile, their ignorance is a source of profit for the dealers, who are in trade principally for the purpose of earning money, not for the love of their customers or of fishes.

I recently made an attempt to estimate the number of hobbyists in Hong Kong and was surprised by one dealer, who claimed that there were about three aquarists to every telephone in the Colony. This statistical method may not sound too precise, but it is fairly accurate. When I first applied for a telephone I was told that there were 7,000 names preceding mine on the list for my district; as the number of both telephones and aquarists is tied in with the number of households, perhaps his estimate is based on fact. Maybe you can get a better idea of the popularity of the hobby from the number of persons who are engaged in the full-time occupation of raising worms and *Daphnia* and bringing these foods to town for sale: 120.

Although many varieties of salt-water fish used to find their way here, largely for re-export, the number has diminished considerably because of the closing down of the American market. A few species are occasionally exhibited and offered for local sale, but almost no one attempts to keep them, although the waters around Hong Kong contain a rich variety of marine fishes that can be easily caught by hobbyists or purchased for only a few cents from the fishermen, who find them of no value for the food market. This embargo on the export of fishes works to the advantage of the local hobbyists, because prices are thereby kept down. I doubt that there is any other place in the world where the hobby can be indulged in at so low a cost. Fishes, plants, and accessories, as well as show tanks, are all available much more cheaply than in other lands. Climate and water supply also favor the amateur who might otherwise be discouraged by poor results.

During a recent visit, Dr. Axelrod suggested to me that I would be able to perform a valuable service for aquarists the world over if I would prepare an article dealing with my own experiences with the most prominent dealer-breeders in the Hong Kong area, paying special attention to the professional

19



Our interpreter, Mrs. Mak, discussing with Mr. Fung some of his many outdoor breeding and raising tanks. Notice the holes cut in the concrete: these are to provide for the drainage of overflow brought about by the occasionally heavy semi-tropical rains.

the island of Hong Kong itself. As a matter of fact, our first destination on this morning was the hatchery of the Kowloon Aquarium, owned by Mr. Fung Tak On. Mr. Fung's grandson manages the shop of the Kowloon Aquarium, and he speaks very good English, a comparatively rare asset among local dealers. The shop is situated on Nathan Road, the main thoroughfare of Kowloon. It seems that most of the breeders are located on the mainland because the water supply in this area is more acid than that on the island. In addition, a river runs through the breeding area, the only sizeable river of which the Colony can boast.

My companions and I set off in the car so graciously provided by Mrs. Y. C. Ng Mak. She proved to be most helpful on the trip, as my knowledge of Cantonese and Robert's fluency in English were both inadequate to conduct interviews. Mrs. Mak not only speaks both languages well, but is also a trained scientist, being a professor of biology. Having crossed to the mainland by ferry, we drove a dozen miles along the east coast road to just beyond the holiday resort of Shatin (pronounced like *sardine's*). Here by the seaside, on the left side of the road, the train runs along an embankment. On the

21

embankment a sign in large letters proclaims the location of the Kowloon Aquarium and an arrow points to a little archway cut in the embankment. This archway is the entrance to the hatcheries, which are situated about two hundred yards up a winding path. We had made no appointment, but luckily found Mr. Fung Tak On at home. He received us with great kindness and hospitality and devoted to us two hours of his precious time.

Mr. Fung is also known to the trade as George Bing. He admits to being over seventy years old, and to having spent forty-five of those years in tending fishes. Originally a hobbyist, he was one day persuaded by an American friend to export to the States; this was the start of an important business. His house is located on an attractive hillside facing a channel of sea water, with a range of mountains in the background. The house is surrounded by banana trees, and nearby stood two fish houses, one for larger species and one for smaller species. There also were several outdoor ponds, from one of which he brought some newts with brightly spotted bellies. He taught us how to differentiate between the sexes and explained that he raised the newts mainly for dissection by university students.

Mr. Fung first conducted us around the main fish house, which is kept at a temperature of 72 degrees by a stove. The outdoor temperature on that morning was around 55 degrees. At this time of the year the temperature is likely to veer erratically and abruptly, according to the prevailing winds, and the fishes do not take kindly to these sudden changes, however effective the thermostats in our tanks might be. Among the species we saw were several Discus (a great local favorite), Black Angels, Neon Tetras, and Scats. The last mentioned can easily be caught under the rafts at our beaches, where they abound in the company of countless *Theraponts*. The tanks contained not only locally-bred species but also a large quantity of imports from Southeast Asia. These imports are bought when very young and are then raised in Hong Kong for re-export when they have attained greater size and are consequently worth more. Prices on the local markets are related to size, mostly; in the case of Discus, the price rises by the millimeter. Therefore, the purchase of young fishes for resale when mature is profitable to both the professional and amateur hobbyist.

Fung imports very little from Red China, relying mostly on the centers of Singapore and Ceylon. Surprisingly enough, he also imports from South Africa, a region I have never heard mentioned elsewhere in connection with our hobby. Re-exported fishes usually go to America, Europe, and Australia, although India and Persia also provide markets. Before the war they were shipped by President Lines, but they are now shipped to the U.S. by air freight at a cost of thirty Hong Kong dollars per kilo. One Hong Kong dollar is at present worth about 17½ cents American. A Kilo is equivalent to about 2½ pounds.

Fung was the first in Hong Kong to breed and export Neons and Angels.

22



Mr. Fung inside one of the fish houses, standing by a tank of Angels. Mr. Fung is also known in the trade as George Bing.

Thirty years ago he sold the Neons at H.K. \$100 a pair. Now the price is down to H.K. \$1 a pair. The late Mr. Passant Lynn of Hong Kong Aquarium did business with and learned much from Fung. In these hatcheries, when the outdoor temperature reaches 78 degrees, an average of ten thousand Neons per month can be raised. When market values are low it is not worthwhile to incur heavy fuel expenses during the four months of winter, from December to March.

The water is obtained from a well that Mr. Fung had built on the premises, although there is a river nearby. After showing us around, Mr. Fung invited us into his house for a drink of the real China tea, and we feasted on papayas cultivated in his own garden. During the conversation he told us how he had formerly worked on another island of the Colony, where he captured many marine species. I believe that I am the only person in Hong Kong who has seriously attempted to keep marine fishes in the home. I am aided by products

23

that I buy directly from America and by the information in some of first-class American and German handbooks. I asked him why my dark Clown Fish, *Amphiprion xanthurus*, went blind so quickly in my tanks. They were delightful pets, showing their disapproval of newcomers by swimming right up to them and making clearly audible noises, but within a few days their eyes swelled up. Fung said that they were deep sea fish, not easily accustomed to tanks. The light Clown Fish, *Amphiprion percula*, were easily kept, and they are the species most often exhibited in tanks here. Some dealers employ a rather shady practice whereby they sell them to innocent purchasers who believe that they can be popped straight into a freshwater tank. Fung had poor luck with his baby Sea Horses, which rejected a diet of brine shrimp.

Among his many other interesting observations, Mr. Fung reported that a native of North Borneo had assured him that he had seen a young Clown Loach measuring eight inches, including the tail, and Fung himself is convinced that the fish can grow to a length of twelve inches in the wild state. This fish has been observed to spawn in the hollow trunk of a submerged tree. Concerning the variously-colored "Sharks", *Labeo bicolor* and *Labeo erythrinus*, Fung indicated that there is in reality only one species, the male showing the more vivid colors. He has not been successful in breeding these,

A roadside view of the Kowloon Aquarium.



24



In many cases young fry are able to obtain a valuable supplement to their diets from the abundance of algae in these tanks.

but he reports that they will live in hollow bamboo canes, which should be used in breeding experiments. Fry under an inch long could not be kept through the winter in unheated tanks, although they could survive in outdoor tanks.

After leaving Mr. Fung we continued northwards, covering another dozen miles, and turned off the main road near Fanling Station to visit the hatcheries of another important breeder, Wong Yip. When we arrived he was having his afternoon nap and his wife showed no inclination to awaken him, but she did let us have a look around. Here we saw great quantities of Discus. We were told that only the small ones were for sale, but there were no small ones. These fish are easily obtained from dealers in town, however, as they are much in demand. The next most common fish was the Black Angel, and I saw a number of tanks full of pairs having badly distorted fins, which were evidently being bred to evolve even more unsightly monstrosities. I noticed that for both the Discus and the Angels Wong Yip made use of gray bricks stood on end, and I saw hundreds of Black Angel fry wriggling away on the top of one of these bricks.

So ended this trip to the breeders, as there was no time left that day to make further inquiries, and because not all of the breeders can be persuaded to cooperate so hospitably with strangers.

25

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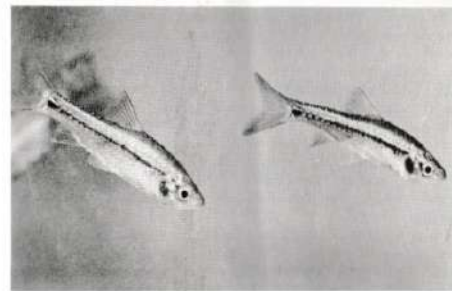
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An attractive newcomer from Northern Rhodesia.



The Gill-Spot Barb, a new species from Northern Rhodesia. Photo by Wilhelm Hoppe.

The Gill-Spot Barb

BY KLAUS MECKE

Photo by Wilhelm Hoppe

The Barb family has long been popular and well liked as members of the community aquarium. There are many species which are commonly kept, because of their active habits. Fortunately I was able to get a new species from a large African shipment received by Aquarium Hamburg. It was a welcome addition to my collection of Barbs, and I hope that everyone will soon be able to keep this species. The following lines will serve to help you make your acquaintance with the "Gill-Spot Barb."

There are already tank-bred specimens on the market, and I was the first to keep this species. A previously prepared aquarium with aged water and a bottom of sand and pebbles housed the newcomers. The Gill-Spot Barbs immediately felt at home, in spite of the fact that they had just completed a long journey. There were no signs of weakness to be seen. This was

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The boys set a seine across one of the pools. The grass along the banks had edges like hack-saw blades, which I found out the hard way.

raucous, brightly-colored parrots, lending life to an otherwise peaceful scene. If a gifted painter depicted the scene accurately on canvas, you'd swear he was exaggerating!

The water is light brown but transparent, an indication of a slight amount of acidity from decaying vegetation. Louis Chung, a veteran fish collector who knows this country like the back of his hand, had some business which was taking him elsewhere for an hour or so, and he asked me if I wanted to stay with the boys and catch fish, or come along with him. Of course I chose to stay. We picked a spot where the bank was fairly free of obstructions and the boys dragged the seine toward this spot. When they got as far as the grass along the bank, the others poked their hands and feet in to chase the fish back into the seine. This done, the top and bottom of the net was lifted out. Immediately there was a violent commotion in the middle, and the men yelled "Hourri!" This proved to be a fish more than a foot long with a formidable mouthful of teeth. I saw at once that it was a *Macrodon trailli*, one of the most common predatory fishes of this and many other areas. Even while he was in the seine he was greedily snapping at the other fishes. The boys were happy when they had the Hourri and a couple of large *Glyphis jurupari* flopping on the bank. They had caught their supper on the first haul. We then turned our attention to the smaller part of the catch. Why didn't we do this first? Well, a seine with a live Hourri in it is not the safest spot to have

your hands! The smaller ones, discounting the colorless and hard-to-see species like *Moerhousia oligolepis*, some species of *Cheirodon* which were merely silvery with a spot of black in the caudal base, and just plain silvery Tetras, consisted mostly of the Pencilfish varieties. It was amusing to hear Lal, one of the East Indian boys, identify one of them correctly by calling it "Namestamus trifasciatus."

"Where you learn this, mon?" I asked him. Everybody is addressed as "mon" in British Guiana.

"I listen to the fias, sir!" he told me with a big, almost toothless grin.

By this time the fishing fever had hit me. I stripped and put on a pair of bathing trunks which I had taken along "just in case."

"Now we catch some fish, mon!" I told them and got into the water. The boys all laughed. At the next haul one of the boys yelled "Pera!" but a single glance told me that it was only a Wimple Piranha, *Catopristus mento*, often described by my friend Harald Schultz. I picked one up and showed them that it was not a real Pera, but one which had scarcely any teeth at all. By the way, in case you have become confused by now, "Pera" in this country is the same as "Piranha" in Brazil. At the next drag one of the boys shouted "Pera!, bad Pera!" and I found myself hip-deep in water from which we had just netted a six-inch real Pera! It looked like *Serrasalmus nattereri*, and my first impulse was to get ashore and stay there. But this meant "losing face" with the boys, and I figured that if the situation called for a real



Included in our first catch was an eating-size *Macrodon taira*, held here by one of the West Indian boys. We also got many Pencilfishes, some *Characins* and a few unwelcome Piranhas.

A line of palms across the savannah country indicates the presence of a stream of water. In the dry season, sometimes there is nothing left but pools here and there and very little else.



retreat, they'd be scrambling out themselves and for this reason continued, constantly wondering which part of me they would prefer, white meat or dark meat. The next draw of the net made me forget this (well, almost!) when our catch included what looked like a *Hyphessobrycon* species which was silvery with a large blood-red spot in the caudal base. We filled several cans. The visions I had of introducing a new "Tail-light Tetra" to the hobby were somewhat blighted when Louis saw them later and told me that he had seen them and caught them previously, but hadn't been able to keep them alive in the cans. We also got another Characin which I had not seen before, with shimmering bluish sides on an almost transparent body. Both withstood the rigors of transportation to the fish farm, and perhaps they will be newcomers to enrich the collections of fish hobbyists. It's almost too much to hope for, but maybe they'll be new to science as well!

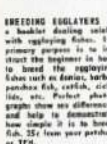
Note by the author: These lines were written while I was still in British Guiana. When my boxes of fish were finally shipped to me in New Jersey, there were no specimens of either of these fishes included, and I am forced to the conclusion that they must have died at some point along the way. If I ever get down that way again, I will not only attempt to collect live specimens but also take along a jar of formalin wherever I go and preserve a few specimens of what looks new to me. In other words, I'll forget about being strictly a hobbyist and try to be a bit of a scientist as well!



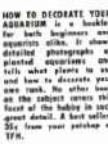
DWARF CICHLIDS is a booklet which deals with the small cichlids of the genus *Atilapia* and a few other genera. It shows remarkable photographs of all the common varieties, along with detailed information on what to feed them and how to breed them and keep them in good condition. This is a MUST book for all hobbyists. 32¢ from your petshop or from TFH.



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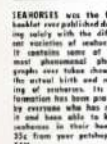
Monocirchus polyacanthus, the Leaf fish. The extension of the chin of the fish at right is not necessarily a sure indication of sex. Photo by Gunter Sennf.



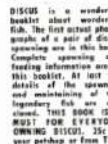
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The Autumn Leaves Drift Past My Window

BY DIANE SCHOFIELD

The "leaves" in this instance are the Leaf Fish and the window is the window peering into a watery world of an aquarium. As far as the "autumn" part goes, the Leaf Fish is an old dead brown color and that doesn't exactly sound like the vernal part of the year, does it?

No umbrage can be taken with the fact that the Leaf Fish really does "drift." Here is no frantic, desperate expending of energy in darting to and fro, or, for that matter, even forward and to. Even in a tank the Leaf just seems to "coast" along with fin movement obvious only upon the closest inspection. It seems that at one time the Leaf evidently sent for a Butterick, McCalls, or Simplicity pattern of a leaf and followed its design to the letter. The edges of the fins are almost transparent and serrated, much as are the external borders of certain leaves. The body of the fish is compressed—leaf style. The three lines which radiate from the non-obtrusive eye, as well as the stripe which runs from eye to tail, are reminiscent of

the veinings of a leaf. The fleshy protuberance projecting from the lower lip, one-quarter of an inch, gives the illusion of a stem. In fact, the Leaf Fish looks more like a leaf than some leaves do. He carries this masquerade even down to the color and goes the leaves one better to boot—they can't change their color and the Leaf Fish can. He's pretty well limited to various shades of brown, however. They range from sepia, to amber, to tan, to chocolate, to a brown that's almost a black. Occasionally when the Leaf feels in a fancy mood, he can also put on a bit of mottling. To act out his role even further, he usually is found in a head down, or "stem" down position in the water.

With all this counterfeiting, it seems as though they would be rather difficult to observe, but oddly enough they have been described as far back as 1840 by Ernst Heckel who hung their generic name of *Monocirrhus*, meaning "one appendage" on them. This refers to the "beard" worn by some of the "beatnik" members of the clan. On this occasion in 1840 probably some knuckle-head of a Leaf drifted out in a stream that was bare of leaves and then wondered why he got scooped up. If they stay in their leafy element, they can only be observed if they are so incautious to zig when the other bona-fide leaves are zagging.

In a tank with the usually green leafy bowers, they are, of course, easier to observe and it was in such a dealer's tank that I spotted my first "pair." The Leaf Fish was one of the first "pairs" of fish that I ever purchased when jumping into the tropical fish hobby feet first. You may say that this was a pretty poor selection for a rank amateur to make, but then, I suppose, the dealer needed to make a buck and nobody stopped me. I didn't go into this thing "cold turkey" because I had read up a bit about the Leaf and was on to at least part of his wily ways. I was certain that this was a "pair" because one of the fish was a deep chocolate brown and the other tended to a light sepia and as any fool knows, this is a sure fire way to sex fish. The only thing that I hadn't reckoned with was that the Leaf Fish is a Nandid and rapid changes of color are more or less of a hobby with them. The following morning they had switched color. The one that had been a deep brown, now was a tan color and the sepia coloured fish wore the dirt-colored tones.

There is a theory pertaining to the "beard" on the chinny-chin-chin of the Leaf. This, for a good many years, was taken to mean that the fish bearing this tonsorial appurtenance was a boy-type fish since what "girl" would be so unfeminine as to flaunt a bunch of "whiskers." However, some learned biologists have blasted this presumption into a cocked hat when they dissected a bearded one and discovered that there were egg-bearing ovaries in this fish. Of course, such a practice to determine sex virtually ruins one's specimen, since considerable difficulty is experienced in glueing

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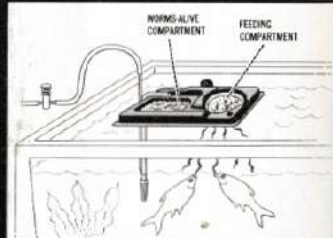
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the fish back together again, but then, I suppose, that there is a certain satisfaction in knowing that you were right all along.

The practical use to which this "beard" is put is debatable. Obviously there must be some utilitarian purpose since Nature is very neat about those things. Some people seem to be of the opinion that this might be used as "bait." Some of the varieties of fish found in the deepest regions of the ocean use similar devices to lure their dinner within striking distance. This bit of flesh is waved enticingly and soon instead of a juicy morsel to be eaten, the eater is instead eaten himself. That this "bait" is minus in some individuals could be possibly laid to the fact that it was bitten off in an unguarded moment. There are often fisticuffs among themselves.

The mouth of the Leaf Fish is a thing to behold! While the fish is in repose it does not look so formidable, as a matter of fact, it looks a little on the small side, but wait until a prospective blue-plate special heaves into view! The Leaf Fish has an arrangement of tissues on the front of his face that expands for all the world like a collapsible drinking cup. One minute there isn't anything there and the next there is a long tube arrangement. Not only does he have this extender, he also is related on his mother's side, to a Hoover vacuum cleaner. What's more, he doesn't need the added impetus of electricity to set this mechanism in motion either. When the entree comes swimming by, the Leaf slurps or inhales and in a bat of an eye, the Guppy or other fish finds himself getting acquainted with the digestive system of a Leaf Fish. I have watched my two fish eat and they don't even need to be within two inches of the intended snack to eat it. One quick sucking movement and that fish has had it for all time. If you keep ogling a Leaf Fish, you will notice that they are either terribly blasé or terribly bored since they keep yawning and gaping frequently. Whether this is plain old ennui or whether they are flexing this "death chute" arrangement, is something the Leafs have never divulged.

They can hang head downward in the same place for hours, obviously hoping that they are in a likely place by which dinner will pass. Worms and other such lowly forms of life, are beneath their notice. Fish and fish alone will fill the bill. When we had our two Leaf Fish, we also had "Hungry Harry," our Lion Fish, who was also notable for his propensity to dinner on the hoof—or if you insist on being a purist, fin. We had to go around begging pitiously of all the dealers for one crumpled and deformed fish, or any what we called "Guppy-guppies." This was in distinction from Veil-tail Guppies, Spade-tail Guppies, Sword-tail Guppies, or any other type of a Tail-Guppy. In other words, Guppies that were so plain as to be a dime a dozen and not really worth the bother. The only bother that they were really worth was to the Leaf and the Lion Fishes

and they doted on them. When a Guppy who was not long for this world was put into the Leaf Fish's tank, the Leaf would usually wait and see whether the guppy was likely to saunter over in his direction. When it was obvious that it was not going to, or when the pangs of hunger got too great, the Leaf Fish would meet the Guppy half way and before you could get out "bon appetit" or "prosit" the Guppy was half way down the gullet of the Leaf. Anything less than three or four strapping size Guppies per each was a semi-starvation diet to those two Leaf Fish.

While in the beginning I had naively and dewy-eyedly assumed that my two fish were a pair, they didn't. For several years, they eyed each other dispassionately, if at all. As far as each of them was concerned, there was just one Leaf Fish in the tank, and he was it. The Leaf Fish has been spawned in the home aquarium, but not with any great degree of frequency. They spawn in somewhat the same manner as do Cichlids with the spawning site being a flat rock or underside of a large plant such as Giant Sagittaria or Sword Plant. Even a clay flower-pot turned over on its side will suffice. While the Leaf hangs in suspended animation most of the time, the time to spawn is not one of these. The male and female



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assume a side-by-side position and a kind of a cha, cha, cha is danced, accompanied by much giggling and tail-slapping. Then they assume an upside-down position and the serious business of procreation is begun. The female slowly and deliberately deposits her adhesive eggs, one at a time. The male follows behind her and does his bit in the fertilization department. A collection of approximately 100 eggs is par for the course. After Mama has done her duty as she saw it, she washes her fins of the whole thing and wanders irresponsibly off, leaving the old man to tend the eggs and to diaper and burp the resultant babies. He swishes his small pectoral fins over the eggs to circulate the water and prevent dirt from settling on them and cause fungus. The eggs are attached to the spawning surface by a thin mucous thread. At a temperature of 78° the babies will start hatching in 2 to 3 days. They will still be hooked onto the same mucous thread unless Papa is old Mr. Chumsy himself and knocks them galley-west with his tail. Even so, if the bottom of the tank is clean, no damage is done. Within a week they should be about as "free swimming" as any Leaf can ever be. Even at this early age, drifting is the order of the day. They drift and eat and eat and drift. The food of the small Leaflets can be newly hatched brine shrimp or rotifers. From this it should follow that the adults would eat adult shrimp or daphnia, but I never had any luck in this department. Suffice it to say that the food must be live, never frozen or dry. When the babies aren't much over a half inch in length, there is the appearance of the start of tiny beards on some of them—not much more than a "five o'clock shadow," really. At this size they will be able to hunt down fry of other fish of a commensurate length. Usually these are again the hapless Guppies—the ubiquitous "hamburgers" of fish world.



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NOTES FROM ALL OVER
A Tank Grows in Brooklyn

Once again it has been amply demonstrated that aquarium hobbyists are not the only persons who recognize the value of aquariums as eye-catchers and centers of attention. More and more professional planners and builders are becoming thoroughly convinced of the advantages to be gained from the use of well equipped and tastefully set up aquariums as the focal points around which their most pleasing decorative schemes may be worked. Many large public and private institutions are using tank setups to brighten the areas which were once completely bare and devoid of interest; in the process, the public at large has benefited more than anyone else. Encouragingly, planted aquariums are rapidly replacing murals and paintings which, although well executed and desirable in themselves, can in no instance rival aquariums for interest or colorful attractiveness.

Up to now the places in which tanks have been used as aids to decoration have been somewhat restricted, but Aquarium Stock Company has informed us of what they consider to be one of the newer wrinkles in aquarium placement: apartment house lobbies. True, this has been done before, but never on so extensive and elaborate a scale as that prepared and installed by Aquarium Stock for the builders and owners of the new ultra-modern apartment house that has been erected at 808 Cortelyou Road in Brooklyn, N. Y. The functional beauty of this arrangement provides for the people living in the house an oasis of natural, living enchantment; this progressive idea in lobby adornment is a credit to the foresight of the apartment house management and the ingenuity of the Aquarium Stock designers.

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mind and he keeps dressing me in the fashion of the clowns in the circus. Believe me, I'm no Emmet Kelly!

My native home is in the Pacific Ocean. If you are out my way, please look me up. My address is 14 Coral Reef, Manila. If I am not there when you come to visit, you are sure to find me visiting my sister at 77 Sea Anemone Strip, Ceylon, Indian Ocean.

I promise not to make a fuss when you visit. So that you can get a true picture of how we live here, I will continue to go on as if no one were here. My home is water-conditioned and is kept at a constant specific gravity of 1.025. Due to weather conditions we have a never-ending change of scenery. Perhaps an outsider might find it too damp or just a bit too salty, but these are only small inconveniences and could be overlooked, since we have no wind or dust storms and it never snows.

Politically we are citizens of one of the small countries and are constantly in fear of being invaded. However, we make our homes with the Sea Anemones, using their tentacles for protection. If you remember your biology, these are poisonous to any invaders, but are harmless to us. As a matter of fact, we have a treaty with the Anemone nation. We act as decoys and attract food for them, in return for which they offer us the use of their arms. The government supplies us with the food that we need and we have never known a famine. So, as you can see, we are well contented with our way of life.

Occasionally we wander from our protective home and are captured. We are taken in a plastic prison cell over a long voyage to our new cells which are quite different from our natural homes. Our prisons are made up of glass and steel and we are kept confined in them for the rest of our natural lives. But don't get us wrong; it's not as bad as it seems. Our food is brought to us twice daily by our jailer. He's really not too bad a fellow, and tries very hard to keep us happy. He keeps our cells clean and ministers to all our needs. He even tries to take care of us when we get sick. Unfortunately, some of my brothers are not as lucky as I. Their keepers are new at this kind of work and, because they don't know any better, feed us too much food. Having no refrigerator our food soon spoils and this contaminates our new home, with the result that we are soon all too sick to be helped. We also face a new danger with these new keepers. They do not know that any metal that touches our water will soon cause a toxic condition in our homes. Needless to say, this soon causes our quick demise. But, facts are facts: I personally have lived for almost six years in my prison and have adjusted myself to this way of life. I have gotten used to my surroundings and am quite happy. It's not the same as when I was at home, but it's the next best thing. I miss my old friends and the freedom I had. But, I've got to make everyone think that I enjoy my new home better than the old. I must appear to be happy and gay. What can I do? The show must go on. So, laugh, clown, laugh!

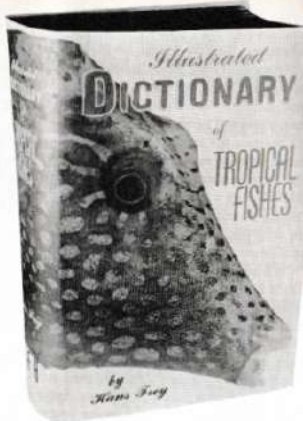
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46



Male Paradise Fish, *Macropodus opercularis*

**Photographic Record of the
Spawning of the Paradise Fish,
*Macropodus opercularis***

BY HANS FREY
Photos by Milan Chvojka

"Of the fishes which frequently form the beginning of a friendship with the beautiful world of the aquarium, surely one of them which can be counted is the well-known Paradise Fish, *Macropodus opercularis*. I myself have won my first spurs as an aquarist by breeding them. In the tiny frame aquarium which I found among my gifts on my 13th birthday, a pair of these beautiful creatures became the first introductions. At my age patience and perseverance were not yet among the most strongly developed human characteristics—however the Paradise Fish happily withstood all the discomforts which became their lot. Winter was at hand, but they did not mind the drops in temperature and changes of water; periods of starvation and other periods of plenty were accepted with absolute equanimity. Of course, judging by my care, I could expect anything else but the difficulty in keeping alive a nestful of young fry.

47

But no sooner than the warm rays of sunshine began to warm the waters of my little aquarium, the fish began to prepare for their wedding. All phases were followed with fascinated attention and were a revelation to me. Never before had I achieved so close a contact with Nature. An even dozen fish was the result of my first breeding attempt. I tended them carefully and watched their progress with the keenest joy. I even watched their development long after they had left my hands by being exchanged for other things with fellow hobbyists."

These introductory remarks with which I introduced Paradise Fish in my book "Bunte Welt im Glase" ("Beautiful World behind Glass") still revive memories of the suspenseful hours for which I have these particular fish to thank.

The following series of pictures of the actual spawning procedure of the Paradise Fish will give you an accurate representation of the natural beauty that has remained fresh in my mind for many years; these photographs were taken by Milan Chvojka, a man who is possessed of the understanding of Nature that is associated with the truly dedicated aquarist.

Let us acquaint ourselves better with the proceedings which take place before the actual mating. The intention is made clear by the male, who approaches the female with gleaming colors, often spreading his gill-plates wide.



Both fish assume a head-to-tail position alongside each other; fins are spread to the utmost, and there is a vibrating shiver which runs through their bodies as far as the tips of their fins. The male swings his ventral fins back and forth, and both fish turn slowly in a circle.

48

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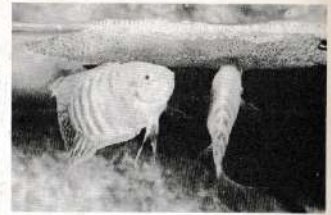
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July, 1961

When the turning motion is interrupted the male drives the female before him, at which time she almost loses her colors and frequently swims with her head up, almost standing on her tail. If the female is not yet ready to spawn, this phase usually ends with the female fleeing from the onslaught of the furious male. Woe beside her if not enough places have been provided for her to hide!



The preliminaries now repeat themselves more and more frequently, until at last the ripe female approaches the nest of her own accord and the real mating begins.

Both fish gently twist themselves about each other. The body of the male is bent in question-mark fashion, and the female cuddles inside the resulting bend. She has lost most of her colors. The gentle turning motions are still continued.



49

Tropical Fish Hobbyist



The female is completely embraced. While the pair has until now maintained normal swimming positions, the male begins to turn the female more and more on her back so that her belly is close to the bubble-nest.

Finally the turning-over is complete. At this moment the excitement of the pair has reached its climax. The male trembles violently, and the first eggs appear.



Immediately thereafter the embrace loosens. The eggs rise, disturbed only slightly by the motions of the parents, into their place under the bubble-nest.

50

July, 1961

The fish seem to be paralyzed. The female sinks slowly to the bottom, belly up, while the male still retains his crooked position. A number of eggs are still suspended in the water. Those that do not float under the bubble-nest are gathered by the male and stored among the bubbles after the mating.



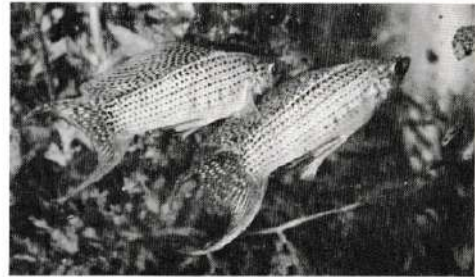
The egg-laying has been completed. The female returns to her normal swimming position, and the male recuperates a short time later. He then swims back to the nest, guards the eggs, pushes them deeper into the mass of bubbles, and makes repairs to the nest.

Some time later the same thing is repeated, until such time as the female is relieved of her egg supply. The time approaches when the pauses between matings becomes always longer, until finally the male no longer allows the female to come near the nest. The care of the eggs and later the fry is then assumed by the male alone.



51

More good news for Mollie fanciers



A pair of Yam Ming's Lyre Tail Sailfin mollies, male below. Photo by Mr. Low Check Leng, ARPS

Another Ace From Singapore's Top Breeder

By Y. W. ONG, Singapore

Mr. Chia Yam Ming, who first hit the aquatic headlines with his original masterpiece, the Lyre Tail Black Molly (TFH August, 1960), has produced another magnificent fish: a Lyre Tail Sailfin Molly.

About a year ago, after having cultivated and fixed the strain of the Lyre Tail Black Molly, Mr. Chia diligently set about to produce a fish with fins of comparable beauty. The result is the new and very beautiful Lyre Tail Sailfin, whose strain is now so fixed that the fish will breed true to type. This ability to produce offspring which are carbon copies of their parents is of course a characteristic much desired in all "sports", and it is to the credit of Mr. Chia that he has withheld the announcement of his new strain until he was definitely sure that the ability was present.

PLATIES AS PETS was written by Dr. Myron Gordon, the fish geneticist who developed most of the varieties in his own laboratory. It has been hailed all over the world as one of the most enlightening books on the subject. It is filled with information on every known platy topic. 32¢ from your petshop or TFH.



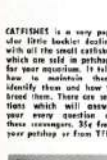
GUPPIES AS PETS is one of the best books ever written on the subject. The author is Dr. Myron Gordon, a fish geneticist for the New York Zoological Society. Its 26 pages are crisscrossed full of guppy information. It tells the secrets of using hormones to color fish, as well as formulae for food for guppies, etc. 35¢ from your petshop or TFH.



GOLDFISH AS PETS is a 36 page booklet dealing with common and fancy goldfish. It has full sections on the care and breeding of goldfish, another section on diseases and fancy varieties. It answers all the questions the beginning enthusiast might ask. 35¢ from your petshop or TFH.



BREEDING LIVEBEARERS is a booklet dealing only with the livebearing fishes such as Mollies, Guppies, Swordtails, Platies, etc. It tells how to feed them, breed them and keep the parents from eating their babies. Photographs enable you to recognize the different varieties. 35¢ from your petshop or TFH.



CATFISHES is a very popular little booklet dealing with all the small catfishes which are sold in petshops for your enjoyment. It tells how to maintain them, identify them and how to breed them. There are sections which will answer your every question on these scavengers. 35¢ from your petshop or TFH.



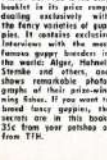
AQUARIUM PLANTS is a 26 page booklet dealing with the identification, care and propagation of aquarium plants. It has been hailed as a milestone in aquatic literature and is an invaluable guide for all aquarists. 35¢ from your petshop or TFH.



SWORDTAILS was written by Dr. Myron Gordon who discovered their close relationship with guppies and he tells how to cross them to get wonderful color varieties. Clear illustrations and photos show the beginner and advanced hobbyist alike just how to breed swordtails. 35¢ from your petshop or TFH.



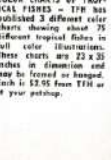
TROPICAL FISH AS PETS is a 26 page booklet with complete information on starting an aquarium. It has sections on plants, stresses, fishes, etc. Over 1,000,000 copies have been sold. Its cover shows many tropical in full color. 35¢ from your petshop or TFH.



FANCY GUPPIES is the only booklet in its price range dealing exclusively with the fancy varieties of guppies. It contains exclusive interviews with the most famous guppy breeders in the world: Alger, Mahesh, Simble and others, and shows remarkable photographs of their prize-winning fishes. If you want to breed fancy guppies, the secrets are in this book. 35¢ from your petshop or TFH.



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Yam Ming's Black Lyre Tail, showing the fringed pelvics at their maximum length. Photo by Mr. Low Check Leng, ARPS.



This picture, taken by the author with an Agfa bellows camera without closeup lens or fish attachment, clearly shows one of the males in the act of spreading his dorsal fin.

Mr. Chia Yam Ming beside some of his Lyre Tail Molly tanks. The chair was specially designed so as to provide a comfortable position to watch the tanks. Photo by Y. W. Ong.



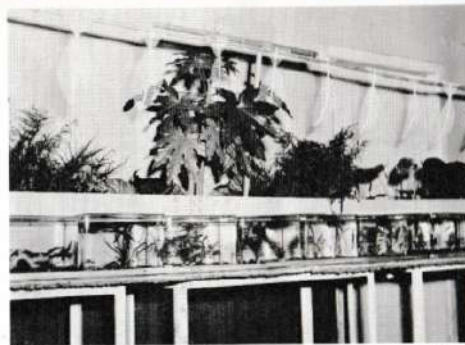
Yam Ming's Sailfin Molly has the markings and colorations of the normal Molly, but the fins are very much different from those of the regular Sailfin. In the male of Yam Ming's variety the caudal fin has completely developed into a lyre shape, with the bottom elongation being $\frac{1}{2}$ -inch longer than the top. The top extension bears the customary mother-of-pearl markings, but the bottom elongation is devoid of these patterns. The pectoral fins, too, differ from the normal, reaching as far back as the mid-point of the anal fin. In males under $1\frac{1}{2}$ inches in length, the pelvic fins resemble those of *Betta splendens*, but they are smaller and shorter. As the fish gets older the pelvics attain a corresponding increase in length and break up into fringes at the tips. This makes the fish look as if he were carrying around a pair of tassels. It is not unusual in a fish three inches long for the pectoral fins to be as long as the dorsal. The females of this new variety also show the lyre tails and extended pectorals. What's more, their dorsal fins are fully as developed as those of the males!

The tails of Yam Ming's Mollies begin to show the lyre shape when the fish is only $\frac{1}{2}$ inch long, and at that size they are very cute. The sight of the mature male spreading his dorsal before his selected female is truly breathtaking. I have kept and bred many Mollies in the past and have always enjoyed watching the courting antics of the males, but the sight of Yam Ming's Lyre Tails in full splendor has given me a new appreciation for this old aquarium favorite.

Yam Ming presently has over 300 specimens of his new strain, none of which has as yet been offered for sale. However, he is open to reasonable offers from wholesalers, and it is hoped that this new beauty will soon make an appearance on the American market. The address of Mr. Chia's fish farm is: Singapore Tropical Aquarium, 100 Clementi Road, 7 $\frac{1}{2}$ m.s., Singapore 21.

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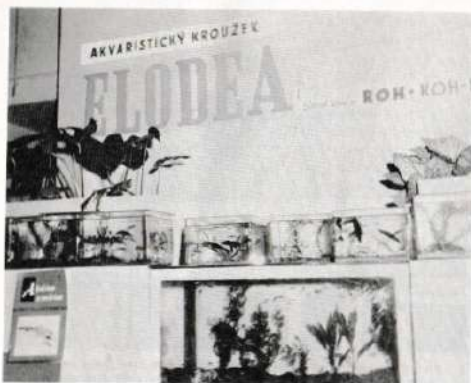
Part of the display at a recent show held by the Czech Aquarium Club "ELODEA". Notice that all-glass tanks are used for small tank capacities.
Photo by J. Pesina.

The Aquarium Hobby in Czechoslovakia

BY JIRI PESINA

•ELODEA Aquarium Club
Prague, Czechoslovakia

There are about seventy large aquarium and terrarium clubs in Czechoslovakia, so you can see that the hobby is popular over here. These clubs are organized as the so-called "factory" clubs, sponsored by the Czechoslovak Trade Unions. My club, ELODEA, has about 250 members, but the average number of members in each other club is 100. Besides the regular club members, there are many individuals who attend club meetings from time to time. The Culture Institute at Prague serves as the central organ for all aquarium activities in Czechoslovakia. Aquarium societies make exhibitions and nature trips an integral part of their activities, and efforts are made to see to it that



This show, held in Prague, was devoted to Guppies. There were 50 all-glass 2-gallon aquariums, each containing three to five males and one female, and five 30-gallon aquariums, each containing about 100 males. Photo by J. Pesina.

all classes of people in the nation become interested in the hobby, especially the youth.

There are at present about 110 species of tropicals kept here. No salt water fish are kept, as there are no salt water species native to Czechoslovakia and no facilities for maintaining marine aquaria. Most of our fish are obtained from Germany in exchange for our cultivated species, especially *Hyphessobrycon innesi*. We currently have many species of *Damios*, *Barbs*, *Rasboras*, *Cichlids*, *Panchax*, and assorted livebearers, as well as *Bettas*. Average fish prices are as follows: *Hyphessobrycon innesi*, 5 kopecks; *Rasbora heteromorpha*, 4 kopecks; *Pterophyllum cinctei*, *Puntius tetrazona*, *Puntius titzei*, *Epiplatys chapoi*, and the more popular *Hyphessobrycon*, 3 kopecks; *Damios*, White Clouds, Mollies, Platys, and Swordtails are about 2 kopecks each. These are the prices from private cultivators; prices quoted by the "cooperative establishments", the magazines, are about twice these amounts.

Many tropical aquatic plants are raised and only the Madagascar Lace Plant, *Aponogeton fenestratis*, is rare. Plant prices vary from 1 to 3 kopecks,

the lower prices being for the more common varieties and the higher prices generally reserved for the *Aponogetons* and *Cryptocorynes*. All aquarium accessories may be purchased through the magazines. Thermometers cost 13 kopecks, airstones cost 2 kopecks, and a vibrator pump, the most popular type, costs about 100 kopecks. Large aquaria, from 5 gallons up, are of the usual frame type. Smaller aquaria, under 5 gallons, are usually glass. A twenty gallon aquarium costs about 120 kopecks; a 2 gallon all-glass aquarium costs about 25 kopecks.

Most hobbyists collect their own live food from ponds in nylon or silk nets. Brine shrimp eggs are sometimes available, but they are costly. Dried foods

This tank set-up is in the livingroom of the apartment of a private citizen.
Photo by J. Pesina.





All glass enclosures are practical for small display tanks, but they cannot be used where there is any danger that different areas of the tank will be subjected to opposite extremes of heat or cold. Photo by J. Pesina.

can be obtained at about a cost of 22 kopecks for a little over a quart. Other prepared foods are also on the market. Most Czechoslovakian aquarists maintain their tanks in their own flats. Efforts are made to keep each species separately, and the tanks are arranged as decoratively as possible. Willow and alder roots are used to decorate the tanks, as well as rocks such as granite, gneiss, and quartz. Most of our successful breeders are good at practical chemistry, as they test the water for hardness and alkalinity, and also test the rocks for their lime content. Many hobbyists here also combine their aquaristic abilities with their photography hobby and take interesting pictures of their fishes.

We find that our hobby provides us with certain advantages over and above the purely personal pleasure that almost everyone derives from contact with nature; neatly set up tanks add much to the decorative scheme of our apartments and are fine sources of conversation, besides. Perhaps it is true that all of us are inherently fond of nature and wildlife and that only the miser or the brute has no love for the animal kingdom.

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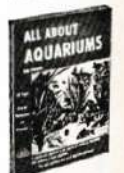
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Fungus and hollow bellies

Q. I am an avid reader of your magazine and find it very interesting and educational. I have a few questions which I hope you will answer. In my 26-gallon community tank I have a Swordtail that has a growth resembling a white fungus, but upon closer examination it appears that the body is covered with lesions. The female Swordtail is the only fish in the tank so affected, and she also has the shimmy. There are fifty average-sized fishes in this tank, and I feed them white worms every week and a variety of dried foods every day. I am wondering what this lesion-like disease is and whether there is a possibility that it will be contracted by my other fishes.

I have also noticed that in this same tank my livebearers frequently get hollow bellies and later die. Is there any remedy for hollow bellies? Finally, I am wondering if it is normal for a livebearer to deliver all female babies, for I have a fish that produced about 25 babies, all of which were females.

Dieter Lohrke,
St. Joseph, Mich.

A. Your hollow-bellied livebearers could have become that way from a number of different causes: poor water condi-

tions, internal parasites, overcrowding, deficient feeding, etc. In your case it seems that overcrowding has contributed to the condition; cut down on the number of fishes in your tank; insecty would be a lot better than Sifts. Also, feed with more variety. Once the hollow-bellied condition has become established in a fish it is very difficult to remedy. It would be better to get rid of the affected specimens.

Your female Swordtail is in all probability suffering from tumors, possibly aggravated by secondary fungus infections. This is not unusual, especially in some livebearers. The answer to the question of whether or not the infection is contagious depends upon the source of the infection itself; some types of tumors and cancerous growths in fishes are contagious, but others are not. To be on the safe side, separate this fish from the others.

No, it is not normal for a livebearing female to give birth only to females, but it is not entirely unknown for this to happen. Disturbances in the genetic makeup of the male parent could cause this, but make sure that the fish are old enough to show sex differences before you determine that they are all females.

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Dirt-eater and peaceful Bettas

Q. In your book *Encyclopedia of Tropical Fishes* I saw no reference to or picture of the "gravel-eater". I don't know its scientific name, but at full size it is about five inches long. The name comes from its ability, or liking, to "eat" gravel, which it seems to be doing constantly. Instead of actually eating it, however, the fish just cleans it and then shoots it out of its gills. I've seen only one specimen, and that one was here in Alaska. Could you tell me anything about this fish?

Art Copeland,
Spennard, Alaska



Geophagus jurupari

A. Your fish agrees in the most important details with the South American Cichlid *Geophagus jurupari*, except that this fish gets to be bigger than five inches long. You have described its actions very well. Despite its large size, *Geophagus jurupari* is a peaceful fish. Incidentally, the habit of taking gravel into the mouth and later shooting it out of either the mouth or gills is not restricted to this species exclusively; many other fishes, especially Cichlids, do this.

Mouth of Betta eaten away

Q. Six months ago I spawned a pair of Siamese Fighting Fish, resulting in about sixty red Betta young. Most of them were sold or given away, but I have kept half a dozen. The three I liked best are separated so that they can keep their fins intact, but I had no objections to occasional fights by the others and put them together in a 20-gallon community tank. They aren't eager fighters and they aren't lother the other fishes, but they are in rather ragged condition themselves.

Some time ago I noticed that the upper right side of one Betta's mouth looked as though it had been bitten away. Since these fish don't mind close quarters, I transferred this one to a jar filled with water from the same aquarium, and left it floating in the tank. For a while there was no perceptible difference in the appearance of the fish, but now the whole upper portion of his mouth has been eaten away. The fish is

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generally sluggish, more so than my Bettas usually are when kept in a jar this size. I have put this fish out of his misery, but his condition has raised some questions in my mind. Are Bettas generally cancer-prone or is it a relatively rare appearance? Is this cancerous condition a sex-linked characteristic? I ask this latter question because I still have the original female, the mother, and she is apparently free of any malignancy.

Elston Hobbs, Bradley, Maine

A. This gradual deterioration of the mouth of Bettas is very definitely not a rare occurrence with Bettas; this happens often, and among all the different strains. However, this does not appear to be a sex-linked characteristic, as females are about equally prone to this infirmity. Constant inbreeding of strains has no doubt contributed in some measure to the encouragement of this condition, but it should be borne in mind that the very nature and activity of the fish itself lead themselves to the development of mouth injuries, with eventual deterioration. It is natural that a fish which is allowed to poke at both hard (glass walls of Betta tanks) and comparatively soft (other fishes) objects is going to sustain a mouth injury sooner or later. Injured parts are attacked by harmful organisms, thus causing further damage.

German degrees of hardness
Q. Your book *Breeding Livebearers* makes reference in a number of places

to what you call "degrees of hardness". My question is: What is meant by a "degree of hardness"? The Department of Water Supply, City of New York, gives a hardness rating (average) of 18 to its water. This is based on a PPM scale.

Edward H. Keiller, Jamaica, N. Y.

A. When I wrote *Breeding Livebearers* the German system of measuring water hardness was in fairly common usage, and I did not consider it necessary to put in both scales.

The relation of one to the other is: 1 DH is equal to 17.9 PPM. This gives you a water hardness of only a little over 1 DH, which is unusually soft and better for egglayers than livebearers. If you increase the hardness for your livebearers, do it gradually so that your fish get a little time to become accustomed to the change.

How many fish?

Q. Can I keep 23 fishes in my community aquarium? It is 10-gallon size, constantly filtered and aerated. The fish average about 1 1/2" in length.

Vincent Dyes, Bricktown, N. J.

A. No, this is too many fish for a 10-gallon tank. Ten fishes of 1 1/2" size would be preferable.

Moving a tank; sick Catfish

Q. I have a few questions which require your advice; would you please answer them for me?

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1. We have two Hatchet Fish which are very peaceful and stay together constantly. Could these be a pair? How do you distinguish between the sexes in Hatchet Fish? What are their breeding habits?

2. We are planning to move our 10-gallon tank from our television set to a stand about a foot away. Is it necessary to remove everything in the tank, or can we leave the sand in the tank, with just enough water for the fish to swim in.

3. Our Catfish (we have bought since last month) will not live. They die or are killed by other fish. What can we do about this?

4. I have found two tiny brown creatures in the aquarium. They look like leeches and have a great deal of elasticity. What can we do about them? Are they harmful?

5. We had an Opaline Gourami in our tank for several months. He was large, but he lived peacefully with the other fishes. Suddenly he began to kill his tankmates, so we had to give him away. What could have caused this change?

Kristina Lacey, Commerce, Georgia

A. 1. Hatchet fishes, of the genera *Gasteropelecus*, *Carnegiella*, and *Thoracochara*, are peaceful fishes, so the peaceful behavior of your specimens toward each other does not necessarily indicate that they are a pair. Very little is known of their breeding habits, and there are no reliable distinguishing characteristics that we know of.

2. It is safer to remove everything, but if you leave only a little water in the tank and the sand doesn't shift it looks like a pretty good gamble.

3. The first thing you can do about it is to stop buying Catfish until you correct the conditions that are killing them. It is unusual that a Catfish, even a small one, would be killed by other fishes. They are usually left pretty much alone, and for good reason. First, their bodies are covered by hard armor-like plates, and nippy fishes soon learn to stop wast-

ing their time battling against these with their mouths; second, they are very peaceful themselves, and don't get involved in scraps with other fishes. Therefore it is improbable that the others, unless they are excessively large and noisy, are killing them. Catfishes (and I presume throughout this question that we are dealing with the various Corydoras species) are great gravel-rooters; when they get sick and die while other fishes remain healthy it is an indication that something is wrong with your gravel, especially if the Catfish spend a lot of their time at the top and at mid-water level in the tank, because it is not natural for them to do this. You do not mention an accumulation of silt in your water, but this is another thing that disagrees with the Cats.

4. From your description, the creatures are leeches, as you have surmised. Leeches are often found in aquariums; they are most often introduced with plants and live food. The most common

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ripes are harmless, but some types can do a lot of damage. In any event, they do not look very pretty, and you are better off without them. If there are only a few, which is not likely, as they multiply rapidly, you can net them out. If there are very many, the best thing to do is to empty and sterilize the tank. From now on, put all of your plants through a quarantine period.

5. Opaline Gouramis are not so vicious as other large fish, but you run into an occasional bad actor. Get rid of him.

Paradise Fish and Mollies

Q. I have what I think is a pair of Paradise Fish, but they act strange. When I first got them they were fine, but now the male chases the female and my three Mollies. He chases the female by the glass and pushes her against it. Are they fighting?

2. Do Mollies fight with their tails?

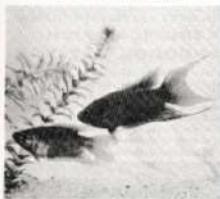
3. Do Swordtails fight with their tails?

4. My Mollies go up and down the glass on their sides with their noses facing the glass. Then they settle on the bottom and start to wriggle. Is this just a habit, or are they sick?

Leonard Larson, Harrisburg, S. D.

A. 1. Yes, they are fighting, and you can be sure that the Mollies and the female Paradise (*Macropodus opercularis*) are going to get the worst of it. Take him out of the tank.

Macropodus opercularis



- 2. No.
- 3. No.
- 4. They are sick.

Sagittaria seeds and Medakas

Q. A while ago I bought some Sagittaria. One had very few roots, but I bought it anyway. A month later this plant grew two seeds, and plants have grown from those seeds. What caused these seeds to grow?

A. I was trying to breed Medakas, but although there are males in the tank and females with bunches of eggs, I have so far found only one baby. Why is this?

Don Wilson, Vancouver, B. C.



The Medaka *Oryzias latipes*

A. Reproduction within the genus Sagittaria can be accomplished by both seeds and runners. Production of runners is the more usual form, but seeds are occasionally produced. If you have snails, which will eat eggs, or other fishes, which will eat both eggs and fry, in the tank with the Medakas it is not surprising that you have found only one baby. If the Medakas are kept separate, they themselves might be eating the young, but only if they are not being fed properly. Then again, the babies might simply be starving to death for lack of nourishment.

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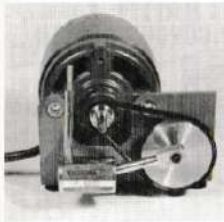
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By Paul Hahnel

Tank set-up

Q. I have six 10-gallon tanks and one 20-gallon show tank, all equipped with both undergravel and outside filters, aerators, crushed glass gravel, Water Sprite, and two 25-watt incandescent bulbs which are left on twelve hours a day. The pH of the water is 6.8 and the temperature is kept at about 75° by heaters. Each tank contains two *Corydoras* catfish, I feed live brine shrimp, *Tubifex*, *Daphnia*, and a little dry food. Could you please tell me the answers to my questions?

1. Why does my gravel turn brown on top?
2. What would be the ideal way to light my tanks?
3. How can I cut down on the growth of algae?
4. Is there any way one can raise brine shrimp successfully at home? How?

Allen Akridge,
Hollis, N. Y.

A. The management of your aquariums looks okay to me. Fifteen Guppies to a 10-gallon tank is perfect; I do not use undergravel filters or glass gravel. Your gravel may be turning brown on top because of deposited sediment. For your 10-gallon tank use only one 25-watt bulb and cut down the time to eight hours; this will also help to reduce the growth of algae. Unfortunately, I have had no experience in raising brine shrimp at home, as it does not seem to be practical.

Dropsy?

Q. About five months ago I made the mistake of giving my fish a bad chill. At first the large ones developed mouth fungus, and many died. After they got over the mouth fungus they seemed to develop swim-bladder disease, and I lost almost all of my older fish. However, I felt that with the many new babies coming on I would be able to start all over again. Now that the fish are from one to three months old they too are beginning to die. The only symptom is that their bodies become bent, the remaining older ones being twisted into an "S" shape. The closest reference to a disease of this type that my books give indicates dropsy because of the bent bodies, but my fish do not have the swollen bellies usually accompanying dropsy. This disease is spread throughout all of my twelve tanks, which are all connected by one filtering system. What

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does this disease sound like to you? Is there any way that I can start all over again without having to disassemble the whole setup?

H. Kluglein
N. Merrick, N. Y.

A. It seems to me that you are raising disease, not fish. All kidding aside, what you call "dropsy" and the bent bodies of your fish are two different things. Dropsy is caused by a bacterial infection of the intestine which causes water to collect in the abdominal cavity, resulting in a swollen belly and protruding scales. It sometimes leaves the fish with a bent body, but not always. If all your tanks are connected through one filtering system, with the water from one tank circulated into all of the others, your trouble could originate here, because you would be spreading infection from one tank to another. If your trouble continues, I am afraid that you will have to disassemble everything.

Q. Your answers to these questions would be appreciated.

1. Where can I buy brine shrimp and live plants for my tank?
2. My baby Guppies spit out a certain type of highly recommended dry fish food. Why?
3. Is it necessary to have a heater, filter, thermometer, etc.?
4. Should I use a breeding trap?
5. How many Guppies do you think I should have to start with?
6. What should I do about diet? Is brine shrimp and dried foods enough?
7. How long will Guppies live?
8. Should I have any other fishes in the aquarium with my Guppies?

David Maynard,
Fairview, Pa.

- A. 1. I do not know your locality, but in any larger city near your home you should have no trouble in getting live plants and maybe even brine shrimps.
2. It may be too big for the babies.
 3. These are all necessary.

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4. Keep the females in a separate, well planted tank, and you will need no trap.

5. Two or three females and one male.

6. You need more variety to raise good fish.

7. Under good conditions, about two years.

8. For breeding purposes every species should be kept in a separate tank.

Siamese twins

Q. I recently watched the birth of a Siamese twin Guppy which was born along with ten normal brothers and sisters. None of my biology teachers could tell me much about this Guppy except that it would soon die. At present it has been alive for 28 hours. Is this rare? Have you ever had any experience with such births? Any information that you could give me would be gratefully received.

Barty Henline,
Vienna, Va.

A. Livebearers will throw a Siamese twin once in a while; I have had this happen on several occasions, but they never live very long, possibly two or three months. Siamese twins are used for cancer and tumor research at Loyola University in Chicago.

Methyl testosterone

Q. I have purchased a book written by Dr. Myron Gordon which has a section about your Guppies. This section states that methyl testosterone may be used to bring out the colors of females and thus make it easier to pick out a good pair of breeders. Is this a safe way to select a pair? If so, would you please tell me where I could obtain this substance in a soluble form?

Leo Bidigare,
St. Clair Shores, Mich.

A. Your local druggist might make you up a bottle if you show him Dr. Gordon's book. Use this preparation very carefully or you will do more harm than good.

Frayed Tails

Q. In all of the books that I have read about Guppies your name keeps coming up; I have read the book authored by you and Dr. Whitrey, and I would like your advice on a problem.

I've been raising fancy Guppies for several years now, but it seems that the more I learn the more trouble I run into. My problem is with frayed tails. All of the books that I have read recommend that I separate the males and the females, but when I began to do this I began to have a higher incidence of frayed tails. I had put eight males into an 8-gallon tank to get them ready for the next local Guppy show, and I noticed that the ones with the frayed tails were getting to look even more ragged, for the fish constantly fought amongst themselves. I then put some females into this tank and found that the males began to improve; the reason for this was that the males became so busy chasing the females that they no longer had any time to fight with one another.

Please give me your ideas in this case. Is my assumption that females in a tank of males helps to prevent frayed tails correct or is it only a coincidence that the frayed males started to heal after the females had been introduced into the tank? Should I follow the books and keep the males strictly separated?

Richard A. Kimker,
Orangevale, Cal.

A. Many breeders all over the world have been faced with the same problem. It is generally known that quality of the water can cause split and frayed tails, but I suspect that this is not the only cause. Food deficiency, bad conditions, lack of calcium and phosphates, and Vitamin D deficiency are all contributing factors. In addition, there are evidences pointing to the fact that inbreeding plays a large part. In your case, since the females seem to have corrected the trouble, by all means use them, but

71

Tropical Fish Hobbyist

I don't think that we can say definitely that the addition of females to the tank was the only factor that effected the cure.

Cross-Breeding

Q. I was wondering if you could advise me about how to go about fixing my own strain of fancy Guppies. You have stated in your numerous articles about breeding Guppies that you have no secrets and that you just let the male select his own mate. I would like to know whether you have ever found it necessary to cross-breed in order to strengthen your strain after you had acquired the kind of Guppy you wanted, or whether inbreeding was sufficient after the desired type of Guppy was propagated. Have you bred generation after generation of Hahnel Guppies without ever crossbreeding into your fixed strain?

Phil Asprelli, New Haven, Conn.

A. I have stated many times that I have never done any inbreeding, but always employed random selection. I let environment play the largest part in producing fine Guppies. As I said, I have no secrets, but one helpful trick is to mix babies from different tanks at frequent intervals; this is to eliminate brother-sister matings as much as

possible. Cross-breeding, or introducing the same type of fish from another breeder, is advisable to get new genes into your strain.

Large males with poor color

Q. Recently I have raised a brood of young that is much different in size and color from the ones that I have been raising previously. They are larger than my regular males, but they lack the same color intensity. I raised them on baby brine shrimp, microworms, and dry food. The females of this brood are of good size, but they are not growing in proportion to the males. For breeding purposes should I select the best of these males and sacrifice color or should I use my smaller males to gain more color?

H. Van Loon, Newark, N. J.

A. I have many times had the experience that fishes out of the same brood are not of equal size and that successive broods of young do not grow to the same size as the last one. Your large males may show up best in about 7 or 8 months. For breeding purposes you should set up the large males in one tank and the smaller males in another tank and then compare the results in the young from each group.

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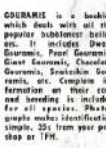
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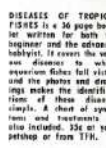
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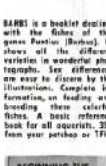
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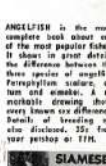
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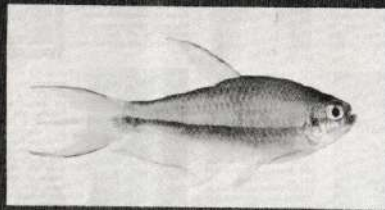
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Tropical Fish Hobbyist

July, 1961

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IMPORT - EXPORT



Henry Huber at the door of his well-known hatchery in Staten Island, New York. One of his ponds is in the foreground.

Henry Huber Dies in Florida

By William Vorderwinkler

It is never an easy task to write about the death of a fellow hobbyist, but when that person was a personal friend as well, it becomes a sad one indeed. Many hobbyists in the New York City area have at some time or other visited Huber's Hatchery in Staten Island and seen the great number of fish and plants always available there. Henry Huber, the proprietor, always delighted in getting a dyed-in-the-wool hobbyist and showing him things that he might never have seen before. I recall the thrill of first seeing a tankful of *Puntius arulius* in Huber's when even Henry didn't know what they were, beyond the fact that they were new Barbs.

Henry began raising tropical fishes in 1928 as a hobbyist, and in 1932 he went into business. Even in those depression days things thrived, and he built his first hatchery in 1938. Here he bred and raised many species, as well as a large number of aquatic plants. His health failed him in 1959 and the hatchery was sold to Joe Neumann, who is running it at the present time. When Henry told me he was retiring and moving to Florida, I laughed and told him he'd never retire and that he'd be raising fish down there in no time at all. Sure enough he did, but early this year his health gave way again, and on March 27th his many friends were shocked to hear of his death.

Henry was an honest dealer, an ardent hobbyist and a real friend to the many people who came in contact with him. Many of us will long remember and miss him.

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SAMPLES TO DEALERS AND JOBBERS ON YOUR LETTERHEAD

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Salts From The Seven Seas



By Alfred A. Schultz

CAUGHT IN THE NET

A letter from Mr. C. B. Williams of North Queensland, Australia informs us that he will soon be exporting live tropical salt water fishes from the Great Barrier Reef of Australia. Many of these fishes will be completely unknown in the marine aquaria of the world. He is now looking for an agent in San Francisco to re-oxygenate the fish after the long trip over the Pacific. Interested parties can get his address by contacting me.

Mr. Paul Weintraub of Martin's Aquarium in Philadelphia informs me that the Marine Society held its first meeting on the 30th of January and that 22 people braved the snow to attend. Their meetings are held on the second Wednesday of each month. Meetings start at 8:00 P.M.

Rib Products of Teaneck, New Jersey has sold out its marine fish division to Walton Pet Center, 17 East 183rd St., Bronx, N.Y. Mr. John Groetzinger of Westchester Aquarium Supply Company has announced a 20% reduction in the price of Neptune Salts. Ruback's House of Tropicals in Chicago has taken on marine fish and salt water supplies. Now that spring has arrived,

the shipments of marine fishes will be increasing and soon most dealers will have an adequate stock on hand.

Q: I have had my marine tank set up for about a month now with a Beau Gregory and a Molly in it and they are doing well. I have placed an order for the following: 3 Filefish, 2 Hermit Crabs, 1 High Hat, 1 Sergeant Major, 1 Banded Coral Shrimp and 4 Dwarf Sea Horses. I am setting up a 20-gallon tank for them. Do you think that this would be crowded?

Tom Kinney, Westfield, N.J.
A. No, the fish would not be crowded, but Dwarf Sea Horses need a tank for themselves. They are slow eaters, and with other fishes around, they would not get their proper share of the food.

Q: I live in Okinawa. I would like to know the length of time natural sea water can be kept in an aquarium before being changed. The reason is that I have the ocean at my back door

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and don't want to pay high postage for shipment of artificial salts from the U.S.
Chuck Bauer, APO, San Francisco, Cal.
A: By all means use ocean water. Change it when it becomes cloudy, but keep a close check on the specific gravity.

Q: I am planning to go to Cedar Keys, Florida at the end of August to collect Sea Horses, Sea Stars and Pipe Fish. Could you possibly give me information on the transportation and care of them? I am getting a 20-gallon Metaframe tank and Eureka undergravel filter. Would the aquarium cement or filter be toxic to saltwater fishes?

Stephen Guy, Huntsville, Ala.



Sea Horses, *Hippocampus hudsonius*. Photo by Lilo Hess.

A: Purchase an air pump made for 8 or 12-volt operation in an automobile and keep a supply of 5-gallon glass jars. Put airstones in each. A 20-gallon Metaframe tank is good for marine fishes, and the Eureka is a good filter, but I suggest you use an outside filter in conjunction with the undergravel filter.

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The beautiful *Nothobranchius rachovi*. The spectacular coloration of this fish more than offsets the difficulties encountered in raising the fry.

***Nothobranchius rachovi* in Nature**

BY GEOFFREY WEBSTER

Bulawayo, Southern Rhodesia

Many words have been spoken and written about the reproductive processes of *Nothobranchius rachovi*, with particular emphasis on the drying-out period for the eggs and the consequent difficulty encountered in hatching and raising this species. Prospective breeders of this little beauty have no doubt by now become discouraged by all of this talk about complications. Well, for the sake of those of us who are charmed by the splendor and interesting habits of this fish, but who are hesitant to begin breeding experiments because of an understandable lack of enthusiasm for involved and lengthy drying-out processes, I am happy to say that my extensive observations of the fish in its natural habitat have led to the conclusion that there is a chance of doing away with all of this fuss.

Before we get into the circumstances that have prompted my ideas in this matter, let's review some background on our subject. *N. rachovi* is a member of the family Cyprinodontidae and is closely related to the species comprising the genera *Apocheilichthys*, *Aphyosemon*, *Cynolebias*, and *Pterolebias*, and is found in the ponds, streams, and spillways in the neighborhood of Beira, Portuguese East Africa. The scorching African sun sometimes makes the temperature in these waters rise to over 90°F., even though they are usually shielded by dense tropical vegetation. The ponds are dry from May to October and fill up only with the coming of the rains in November. This climatic factor is probably responsible for the original assumption that a lengthy dry stage is an absolute necessity for a successful hatching.

Nothobranchius rachovi fully matures in about six or seven weeks after hatching, and specimens of all sizes, fry, young, and adult, can all be collected during the rainy season. These facts, coupled with the fact that experienced and capable aquarists have proved on many occasions that the eggs, once dried in peat moss or mud, will all hatch at about the same time after again being put back into water, regardless of whether they were in the dry stage for six weeks or six months, lead to only one conclusion. It must be that eggs are being laid and hatched while they are completely covered by water; they do not need a drying-out period. Another proof offered to support my conclusion is that adult specimens have been caught outside of their normal season in rivers that never dry up completely, and which therefore do not provide a dry season for the eggs.

The only alternative explanation that I can think of is that the ponds and ditches fill slowly. If the eggs are laid in the sides of the ponds, rather than in the bottoms, these eggs will come into contact with the water at a much later date in the following season, thus explaining the presence of different-sized fish. It could also be that the watercourses do not always remain the same; if an old watercourse contains eggs from the previous season but does not fill until late in the next season due, perhaps, to the interference of a fallen tree or some other obstacle, the water will be diverted into fresh channels and carry along with it the eggs and fry to form new breeding grounds.

Nothobranchius rachovi starts to disappear from its home waters even before these waters start to dry up. This is caused by a lack of food. While the rains continue food is being constantly flowed in, but it later becomes very scarce and only the fittest survive. Females are always the first to show signs of malnutrition. The females are normally full and round and the males brilliantly colored; spawning takes place continuously. The females are never "spawned out"; but become sluggish and hollow-bellied, as the food gets scarce. They die off quickly, the few remaining females being courted ardently by the males, among which violent fighting is prevalent. The males, like male Bettas, can bring the gill plates forward in a show of anger; attacks are swift and dangerous, one direct charge usually killing or seriously wounding

the victim. Toward the end of the season all captured males show torn fins, damaged scales, and other battle scars as evidence of their pugnacious tendencies.

If there is a way of hatching the eggs without resort to the drying-out process, as I believe there is, we must study the fish carefully in order to unlock the key to their secret. Our present knowledge of their habits is not sufficient to tell us what we want and need to find out. The season is here again and I intend to continue my experiments by introducing adult *N. rachovi* to a pond in my garden, watching carefully to see if any fry develop even though they are always under water.

We have a lot to learn about the Annuals, and only constant observation in nature and in the home aquarium will help us to solve our problems with these fish. I feel quite confident that our efforts will be of lasting value, because anything that can be done to make easier the keeping and raising of these beauties will be truly worthwhile. At present the advantages of owning this fish are partly offset by the complications, but I am hopeful that *N. rachovi* will someday become as popular as its good looks deserve.

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