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In TFH's new book about the Siamese Fighting Fish, author Wilfred L. Whitem has done a lot to simplify the care and breeding of *Betta splendens*. Intended as a guide to both the experienced and beginning Betta fancier, Mr. Whitem's book provides the information most useful from a practical standpoint.

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COVER

It's always big news when a new species of tropical fish for hobbyists is discovered. Well, the latest big news is really big, there have been discovered a great number of such species. Many of these fishes are so colorful that they compare favorably with marine fishes! The new collecting wharf is Lake Nyasa, and we've seen about a dozen of the new fishes uncovered there. One species is shown on our cover. But, hang on to your hats, still more new ones have been found, and when they do, you'll see our cover, and when they do, you'll see our cover. For the story on the first of these fishes and color photos of some of them, turn to the article beginning on page 3. Photo by Wilhelm Hoppe.

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EDITORIALY . . .

Never thought we'd make it! Got a letter from a young lady in Park Forest, Illinois who winds up by telling me she is new to the hobby, her interest having been aroused by a gift subscription to this magazine. Then the bombshell, and I quote her verbatim: "I never thought that I would want to spend all my time and money on fish instead of the Beatles!"

Just think, there are people who are watching their fish more, and listening to their Beatle records less! This bodes well for the general peace and quiet, because fish-watching is done quietly, and the fish has not been discovered or developed that sports a mop of unkempt, unruly hair and twangs a guitar. Letters like this, I suspect, will cause the Beatles to worry all the way to the bank!

Seriously, though, the Beatles are fine if you like them, but the aquarium hobby is an open sesame to a number of sciences. For instance, we learn that water chemistry varies greatly, and that if we want to make our pets feel at home, certain simple changes can be made. We enter the field of medicine when we try to cure or prevent diseases in our fishes. We plant our tanks to make them more attractive, and who can resist learning more about the highly decorative plants we get from the far corners of the earth?

The most important thing that most people do not take into consideration is the social aspect of the aquarium hobby. If there is an aquarium society in your town, all you need do is join to meet a great many other hobbyists with the same interests as yours.

William Vorderwinkler

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One of the first of the new fishes from Lake Nyasa in Africa was designated *Pseudotropheus auratus*. The bottom fish of this pair is either an unusual color variety or is in its breeding colors. Photo by Wilhelm Hoppe.

They look like marine species . . .

Colorful New Fishes from a New Territory

BY WILLIAM VORDERWINKLER

It is always exciting to hear about a new place where fishes are found, and interesting to speculate where the next ones are coming from. Many of us think that we have seen all, or practically all of

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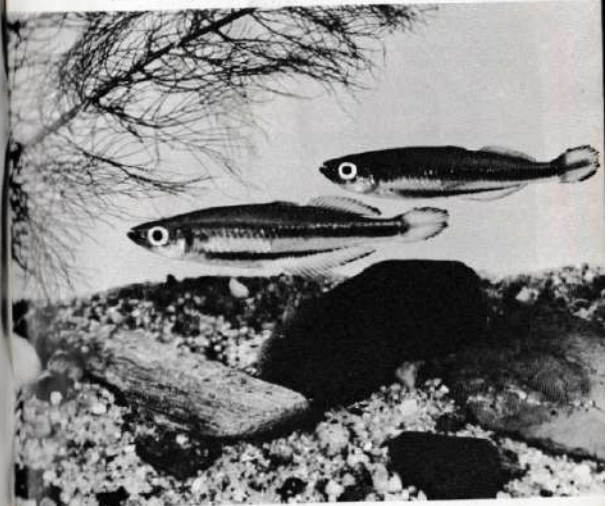
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the fish life that Africa has to offer: the *Aphyosemion* species from the Congo region, the *Epiplatys* species from approximately the same part, the *Nothobranchius* species from the southeastern part, the *Tilapia* and *Hemihaplochromis* mouthbreeding species from the Nile and its tributaries, the butterfly fish and the many characins that occasionally seep in, not to mention the electric catfish and many other catfishes and a few barb species we see once in a while. The island of Malagasy, formerly Madagascar, which I always considered to have possibilities, has given us *Bedotia geayi*.

I recall reading that far back in geological times there was a great drought in Africa, and all but the largest lakes and rivers dried out. Lake Tanganyika was one of the lakes left. Lakes Albert,

Not too long ago, the big news was the discovery of *Bedotia geayi*, a fish which has been found only on the island of Madagascar. Photo by Milan Chvojk.



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Another Lake Nyasa fish, *Pseudotropheus zebra*. Above is a dark color phase of the fish. Photo by Dr. Herbert E. Asselrod. Below is a bright color phase. Photo by Hansen. Note the light spots on the end of the ventral fin. A third color phase of this species is shown on page 12.



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Victoria, Edward, Rudolf, and Nyasa were some of the others. There is an excellent chance that each of these immense lakes harbors a fauna indigenous to it alone as a result of this. Lake Tanganyika is said to have a fish population that numbers more than 200 cichlid species alone! The amazing part of this is that practically all of these occur only here, nowhere else in the world.

Why shouldn't there be similar conditions in the other African lakes? Recently Aquarium Hamburg made an expedition to Lake Nyasa, most of which forms a border between Nyassaland and Tanganyika to the north and Mozambique to the south. Here they were amazed to find some cichlid species that were almost colorful enough to resemble some of our most attractive marine tropicals! Sensing a bonanza of sorts, Aquarium Hamburg set up a collecting station on the shores of Lake Nyasa.

Luckily Dr. Herbert R. Axelrod was in Germany when the first collected specimens came in. He took one look and gasped. American hobbyists, he decided, had to have a crack at these. He bought several pairs of each available species (I hate to think what he must have paid for them!) and rushed them back to the office. Here they were photographed, some of the results of which are shown on these pages. The genus assigned to these fishes is one I have never run into before: *Pseudotropheus*. The experts at Gulf Fish Hatchery in Palmetto, Florida are trying to spawn the fishes, and some have also been given to that wizard, Danny DiCocco. I asked Danny at the last meeting of the Greenville Aquarium Society how things were progressing. He told me he was having a rough time getting them tamed down to a point where they don't rush all over the tank whenever somebody comes into the room. This is always the difficult

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This is *Pseudotropheus zebra* in its light color phase. Compare with the phases shown on page 9. Photo by Wilhelm Hoppe.

Another Nyasa fish, *Pseudotropheus elongatus*. Note the similarity to *P. zebra* (above). Photo by Wilhelm Hoppe.



This *Pseudotropheus* species has not been fully tamed as yet. Photo by Dr. Herbert R. Axelrod.

tank: getting the original wild fish to spawn. The breeder can only guess at what foods will put them in the best of condition, how best to set up their breeding tank, and wonder where they will eventually lay their eggs. Once he gets this far he generally fishes out the pair and with the aid of an airstone keeps the water circulating near the eggs. This is not always the perfect system, but at least the parents cannot eat them. Sometimes a fish will upset the whole apiece by turning out to be a mouthbreeding species. Whatever the difficulties, any of these *Pseudotropheus* species will be well worth the trouble.

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Poecilia vivipara pair. This livebearer is very small and is not often kept despite its perky behavior. Photo by G. J. A. Timmerman.

How I Found *Poecilia vivipara*

BY OTTO ZIMMERMAN

From my earliest youth I have been a fish hobbyist and successful breeder, and one day I decided to make a little more than just a pastime of our fine hobby. For this reason I gave up my original job and became a sailor. In my travels I hoped to get a little closer to the native haunts of our tropical pets. I found I was able to make frequent excursions to some little jungle creeks and swamps in Colombia and to make my studies in some of the islands of the West Indies. Only the transportation of my catch still gave me difficulties. Once a too-great temperature change in the Azores killed my entire catch of livebearers and some characins and other fishes. Some very pretty *Symbranchus* species from Colombia were also among them.

In early December 1962 I found myself on a Greek passenger liner, the *Arkadia*, bound for Martinique, Guadeloupe, and St. Thomas. These islands looked very promising, even from a distance. I could scarcely wait until the steamer docked in Guadeloupe. Black hands grabbed our bowline, and, a little later, our ship was tied up at the pier. The "Old Man" granted me only 5 hours leave. What could I do with so little time? But we were used to such things. The other crew members and myself had this problem in almost every port.

While still half on board, I yelled, "Taxi!" With my primitive equipment, which consisted of a large bag containing a large aquarium net, some pickle jars, a butchers' knife, photographic equipment, thermometer, and a package of peat moss extract, I went as far and as quickly as possible into the interior. Then I set out with thoughts of being able to make new discoveries and dreams of making them known. A few steps off the road I found myself knee-deep in the sticky mud of a swamp. Warned by this, I made my way somewhat more carefully.

After I had walked cautiously across a suspiciously green flat, I set out for a distant green wall of trees, always being careful to get around the soft spots and thorn-bushes. Small flies and gnats descended on me by the thousand. Worst, however, was the murderous heat. At home winter was setting in, but here the thermometer showed 100° F. in the shade. Suddenly I could not continue. A practically impassable thicket of thorns, vines, and roots blocked my way in every direction. I attacked this tangle with my butchers' knife, but it was no use; my efforts were wasted against all that vegetation. Once I got a scare when a large iguana rushed out from under my feet and made for the nearest tree.

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Then I found a small trickle which seemed to come from the green tangle I had been hacking at. Here there was a possibility for further investigations. I sank deeply into the mud. Above this mud there were only about 3 or 4 inches of water. But what water! This mess, as I must call it, was colored a deep brown and reeked from all the vegetation which was decaying in it. The water's temperature seemed just as hot as that of the air, not too promising for someone looking for fish life. This thought had not even finished running through my head when I saw a large school of little fishes go by. Instantly I was after them. I would have never been so clumsy if I had had more time. Naturally my net came up empty.

Disappointed, but still game, I plunged deeper and deeper into the wilderness. Soon I lost track of where I was. The water in which I found myself was no longer a brooklet. It came to my hips and reached far back between the trees. It seemed cooler, too. The mosquitos and other small insects plagued me terribly. I had found a cone-shaped leaf which I had put on my head for protection from the heat. Now I found that a sticky white sap was running down from it over my chest and back. On my legs I found leeches. I was the picture of misery. Unusual fruits hung from the trees, looking like cucumbers dangling on long thin strings. High up, where the trees were almost entirely overgrown with epiphytic plants, I could see large butterflies. A closer look disclosed many tiny, emerald-sparkling hummingbirds flitting from blossom to blossom.

There was a weird silence over everything in this strange world. With some longing, I thought of my friends, who were, by now, probably seated comfortably in some bar in town, drinking their fill of cold beer. Surprisingly, I found my way again into bright sunlight. I was standing before a large pond which was completely covered with floating plants and leaves. The blossoms of the plants gave the entire surface a blue shimmer. I parted this plant cover carefully, and there I saw fishes! My heart jumped into my throat.

Don't you expect that what I saw now was unusual? It wasn't. But I was thrilled anyway. It was the fish with which most of us started, Guppies! In feverish haste, I caught as many as I could get. Each male seemed prettier than the last. Finally there were a few other kinds in my net. My first thought was that they might be platies. They were silvery gray and their only decoration was a large, gold-ringed shoulder spot below the front edge of the dorsal fin. Later I caught two more adult pairs of this species. The males had a beautiful high dorsal fin which was yellow with a black edge.

My pickle jars were now filled with about 50 fishes of the two species. I wanted to make my way back in a leisurely fashion when something unexpected happened. In the grave-like quiet of the tropical jungle I suddenly heard a loud, buzzing, snore-like sound! Where did it come from? You must realize that, after all my difficult wanderings, my nerves were not in the very best condition. Cold chills ran down my back when I realized that the sound

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came from my trousers! Never before did I ever take my pants off as quickly as I did at this time. Then, and only then, did I remember that I had a traveling alarm clock in my pocket, and that it had been set for 4 o'clock. My relief was so great that I had to sit down and laugh at myself.

The time had now come to get back to my ship. On the way, I saw groups of natives hacking away with machetes at tall, red plants (sugar cane no doubt). I also caught sight of a large yellow snake making its way through the swamp. Hindered by my baggage, I could not catch it. I called to the nearest natives: "Whoever catches that snake gets 10 dollars!" The money was no attraction here; they called back in a chorus, "Oh, no, Master!" So I had to return without the snake to my boat. I put my fish catch in a large plastic tub in the galley.

After some difficulty I got the fishes home. They went right into my 20-gallon tank. With peat filtration and a heater, I brought the water to just about what they were living in when I caught them: DH 8, pH 7.5, and temperature 82°F. Peat filtration was continued, and a small amount of table salt was added.

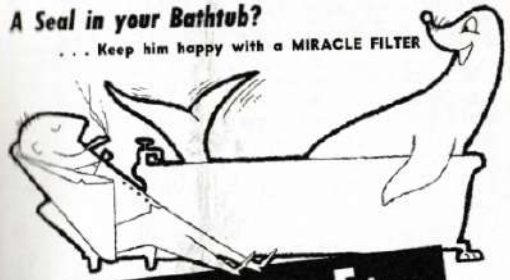
I was most interested in the silvery gray fish with the gold-ringed shoulder spots. According to Sterba, these fish are probably an island variety of *Poecilia vivipara*. Soon I could see that they were growing. My largest female gave birth on February 2 to 52 very large young. Right after birth, the young showed the typical ocellated spot with the golden edge. When the fish approach maturity, however, this marking disappears completely. In its place, on the male, there appear 7 or 8 silvery gray narrow bars on the tail base. On adult males, the dorsal fin becomes very high and wide and takes on a deep lemon yellow color, black upper and lower edges, and dark spotting. The black edges are also found in the female and are very attractive. The males have a body which is high and narrow, the females one which is considerably plumper and broader. Fully grown males attain a length of about 1½ inches, females a little over 3 inches.

After about 11 weeks, the first youngsters had reached a size of 1½ inches. Sex differences were very plain. The males began to show color. From what I have been able to ascertain so far, the species is very peaceful. They can be left in a community aquarium, where they do not even bother newly born guppies.

I would like to add a few words about the guppies I brought back. No two males are alike. There are fantails, flagtails, etc. among them. In color, as well as in form, there are no duplications. When one sees a school of guppies in their native waters, he is reminded of a large flag. At first there passes about a yard of grayish brown fish, the females. Then the males pass in all colors, about 2 or 3 feet of them. The females are, without a doubt, the leaders among almost all the livebearers. I have observed in nature that they always swim at the front of the school.

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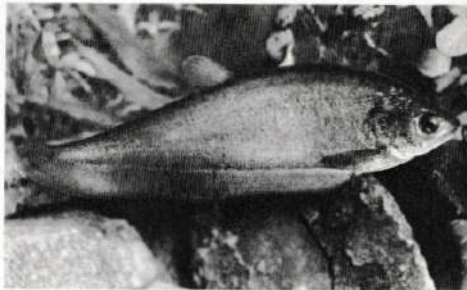
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Notopterus afer has the elongated body and long ventral fin typical of knife fish. Photo by Gunter Seiff.

Spawning *Notopterus afer*

BY ONG KAY YONG

Just this year I bought six knife fish (*Notopterus afer*) from a fellow aquarist for a dollar apiece. I placed them in a 40-gallon tank which had the usual sand, rocks, plants, and some coral for decoration. During the first week, the six began to pair off. Unfortunately two remained unpaired. The two pairs "took up residence" amongst the rocks at each side of the aquarium, keeping the unpaired fish away. During the second week the two unpaired fish died, probably because the other fish were very rough on them and monopolized most of the food.

The two pairs seemed quite contented and made the center of the aquarium an agreed boundary between them. In many ways they reminded me of humans. The two females spent most of their time within the rock-homes, while the males stayed outside, standing guard over wife and home. Occasionally the males visited one another but they would soon return to their former places.

One day I decided to try and spawn these fish. Checking a final time to be sure that they had paired off, I prepared another tank and transferred one

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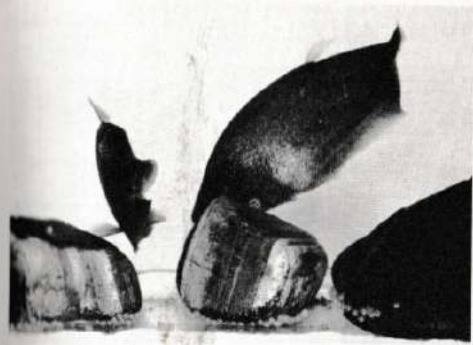
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These are the author's spawning pair of knife fish. Note the clusters of their large eggs around the bases of the rocks. Photo by Ong Kay Yong.

A closer view of the knife fish eggs. Photo by Ong Kay Yong.



These are the babies of the eggs of 3 months. They are 2 inches long. Photo by Ong Kay Yong.



pair to it, leaving the first pair in the original tank. I then constructed rough rock-homes for the fish to hide in. In addition, I began giving them live foods such as wild guppies and other small fishes.

The fish seemed quite happy, coming out of their homes to feed and gambol about. After 4 months, one of the females began to fill out considerably in the belly. The fish were then about 6 inches long. Two months later, while I was cleaning the tank, I found six baby knife fish at the bottom in the sand and dirt. This made me decide to remove the sand and everything else except a few rocks from the tank. I did this, cleaned the tank up well, and got ready to wait. I didn't have to wait long; on the next day I found about 50 eggs lining the sides of the rocks. I transferred these eggs to a small, all-glass tank.

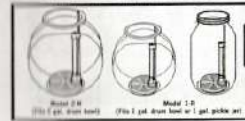
The eggs were transparent, allowing me to see the developing fry wriggle about inside. In a week, they began to hatch. Each baby emerges tail first and must struggle for several hours before its entire body and head follow. The babies are born with very large abdomens (yolk sacs) which weigh them down, causing them to remain motionless on the bottom. After another week the egg sacs are absorbed, and the fry are a little bigger and are swimming freely. At the time of this writing, the youngsters are 3 months old and 2 inches in length.



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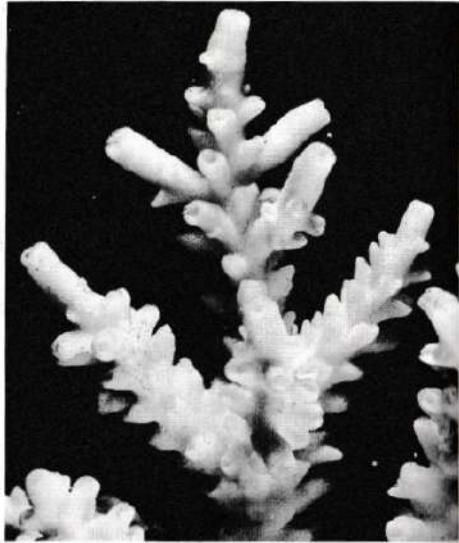
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Magnified *Acropora* species, which was collected in the Red Sea, at Shab Anbar. The tree-shaped coral stem has been formed by hundreds of polyps and their cups.

Architects of the Tropic Seas



Corals

BY DR. GEORG SCHERR
Darmstadt, Germany
Photos by the Author

Abu Asha pushed the tiller hard to starboard. The little boat drifted with its engine off slowly toward a coral head. Mohammed stood in the bow, threw

the anchor on the coral head and then pulled on the anchor line to bring the boat to a standstill. We lay to the leeward of a reef in calm water. Standing atop the cabin we could see how the waves rolled in outside of the reef to break there in a flurry of white foam.

We donned our diving outfits and stepped into the ocean, gliding down into a new and fantastic world... the always-awesome underwater world. Beautiful fishes were all around us: red, blue, black-and-white striped, round, long, crested, trunk-shaped, butterfly-like, timid, and bold; some even came right up to the face-plates of our diving-masks. Some swam about singly, others in pairs, and many in schools.

We anchored ourselves fast to a table-shaped coral stump which felt as hard as rock underfoot. In one place a piece broke off, as brittle as glass. The remarkable thing was that the broken-off piece and the entire coral stump consisted of little branches which were sprouting little cups all over. What could this mean?

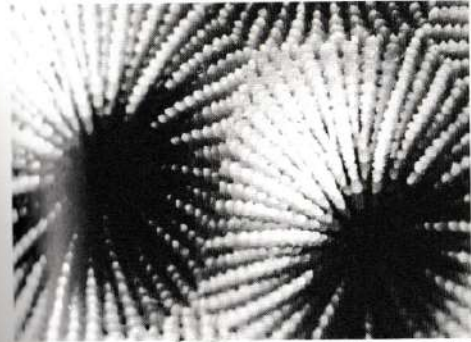
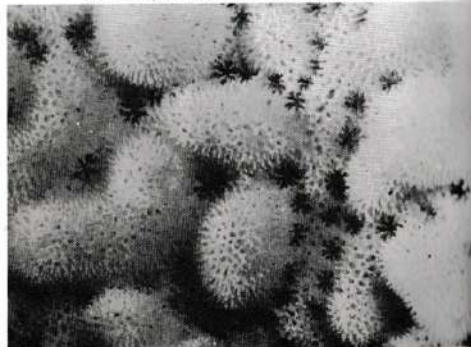
Every coral stem is a colony of countless animals, coral polyps, which are connected to each other by a skin. Every polyp originates from a tiny free-swimming larva of about a millimeter in length, which fastens itself to a hard surface where its foot disc becomes flat and releases calcium. There forms a round base on which there stand vertically star-shaped borders in a ring. The larva now changes into a polyp, a simple creature which consists of little more than skin and stomach and having only one body opening. The supports enclose the digestive organs in folds of skin. Around the mouth opening there are tentacles, grasping tools which are studded with stinging spines with which the polyp captures tiny animals that are drifting in the water. (Coral polyps belong to the same group of stinging animals as jellyfish and sea anemones.)

The release of calcium continues until a cup is formed which houses the polyp and into which the creature can pull itself by muscular contraction. At this point, asexual multiplication begins. On the side wall of the cup little daughter cups put in an appearance, which in their turn carry buds for still more cups. All of this eventually grows into a tree-shaped, branched stem. Some other corals secrete calcium between their cups; this results in smoother rounded coral stems in which only the cup openings can be seen. The larger the openings, the older the polyps and *vice versa*. Sometimes the polyps lie very far apart and the connecting skin exudes rounded hills of calcium. Then again, other corals have very closely-spaced polyps and the cups appear much more together. Their bases unite and resemble a honeycomb. With many corals the polyps tangle and form overlapping mouth openings. The calcium skeleton follows suit. Depending on the structure of their star-shaped supports, there results a picture of harmonic, quiet beauty or, with higher magnification, a wild, tangled landscape. There are also corals where the polyps sit in small, spindle-shaped hills or are lined up in long rows, where their structures are nicely parallel. The rows sometimes meander and form



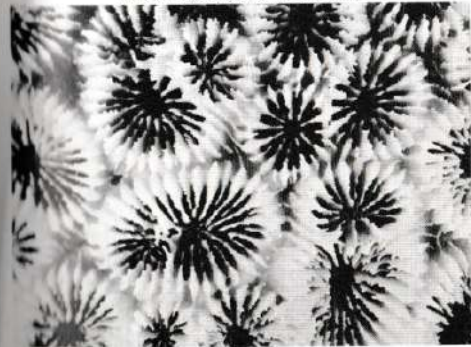
Magnified *Diploastrea heliopora*, from the Wingate Reef in the Red Sea. Note the various sizes of the mouth openings. With increasing age a polyp's mouth opening gets larger.

Magnified *Montipora masandrina*, from the Wingate Reef in the Red Sea. This shows the calcium lumps which form when the polyps lie far apart.



Closely spaced polyps of *Siderastrea siderea* (magnified) from the Caribbean Sea off the island of Bonaire. The polyps' bases have united, and a honeycomb pattern has developed.

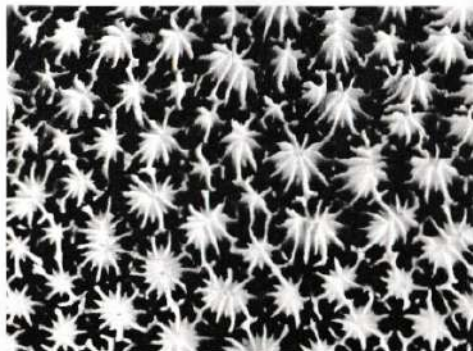
Magnified *Favia speciosa* from the Red Sea. Some of the polyps have tangled and formed overlapping mouth openings and skeletons.





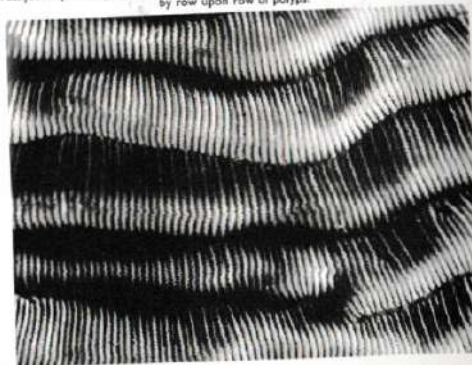
Acanthastrea species, from the Wingate Reef in the Red Sea. High magnification shows the complex, tangled, overlapping form.

A magnified picture of *Hydnophora microcones* shows an amazing resemblance to a pan of coconut macaroons.



The spindle-shaped hills of *Hydnophora exesa*, when magnified, look like the top of a wedding cake.

Pachyseris speciosa (magnified) has a pleasing wavy pattern. The parallel lines are formed by row upon row of polyps.



coral lumps with wandering valleys which resemble the convolutions of a brain. What could be more apropos than to call these Neptune's Brains?

Besides the asexual method of reproduction I have been describing here, there is also a sexual one. In the skin folds of the polyp's digestive chamber the sexual products develop, and here the eggs become fertilized and larvae grow, to be released after a time through the mouth opening. They paddle through the water with the help of their tiny hairs. Thousands are eaten and others are picked up by the currents or settle on the sand and mud of the bottom. A few are able to find anchorage and sprout, bud, and in time build new coral beds. Coral grows in very different ways. Young colonies grow much faster than old ones. Large compact "heads" grow $\frac{1}{4}$ to $\frac{1}{2}$ of an inch each year, while more loosely built branched forms grow 3 to 4 inches in height.

Coral reefs occur only in the tropic seas, for reef corals require water that never drops below 68° F. Best temperatures are between 77 and 85° F. The depth of the water also makes a great difference. At 150 feet there are practically no coral reefs any more. The fastest-growing ones lie between the surface and about 60 feet below it. The main reason for this is a remarkable

Diploria labyrinthiformis (magnified) comes from the Caribbean Sea near the island of Bonaire. The curved rows of polyps have formed the meandering brain-like pattern of brain coral.



Around coral reefs, one finds all sorts of corals that have at some time or other been broken off. From the Maldives, Indian Ocean.

symbiosis with one-celled ball-shaped algae which live inside the polyps and provide them with oxygen. In order to perform photosynthesis the algae, like all other plants, require light which is provided in great enough quantity only in the upper layers of the sea.

An unbelievable amount of broken fragments from the edge of reefs are strewn everywhere around them. The skeletons are all snowy white; only one species (found in the Mediterranean, where there are no reefs) has a red skeleton. Living corals in the ocean are yellowish or brown as a rule, with occasional specimens that have violet stems or some with bluish twigs or green cup openings. During the day the coral polyps pull into their chambers, but at night they stretch out, their tentacles beating about through the water in search of nourishment.

The coral reef is full of wonders. Beautiful fishes, remarkable crabs, elegant snails, formidable sea-urchins, flowerlike tube-worms, and dangerous giant clams live among the bizarre coral heads. The many-armed coral polyps form not only their esthetically beautiful living chambers but also the greatest structures that any animal life can build. Coral reefs from former geologic times stand like mountains before us. The largest structure that living creatures have ever built lies off the north eastern coast of Australia . . . the Great Barrier Reef, about 1,200 miles long and of varying widths. Where are there architects to match this feat?

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not only for fish, but also to keep daphnia alive for quite a while. They can also be used for aging water. A word of warning — when taking out the lines, do not disconnect any of the lines which hold the refrigerant gas. This can be very harmful in some of the older types of refrigerators.

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Neon tetras
Q. About 4 years ago I became interested in tropical fish keeping and decided to try my luck with them. After housing about every tropical fish from the neon tetra was far me. Three months ago my efforts were highly rewarded: my neons spawned and my count found 11 babies swimming freely in my aquarium. I was only able to save two, but today they are still enhancing the beauty of my aquarium. The present conditions in my 20-gallon tank are: temperature 74-76°, densely planted with several varieties of cryptocoryne and red ludwigia, 8 hours of light a day with aeration and inside bottom filter, feeding as much live food as possible with a variety of dry foods. When I spoke to a few fellow hobbyists they were amazed at my accomplishment with the neon tetras.

1. Is it really hard to breed neons?
2. I have never concerned myself

with the pH of the water; is this really necessary as long as everything seems to be doing fine?

3. Will neons eat cooked spinach or other similar foods?

4. I presently have 18 neons in my 20-gallon aquarium; how many more could I safely add?

Leslie Bachers, Rockville, Md.

A. 1. Given the proper conditions, it is not particularly hard to breed neons. The difficulty lies in providing the conditions.

2. Judging from the amount of success you have had and the fact that everything seems to be doing fine, I would say that your pH is not far from what it should be.

3. No. Neons are not vegetarians.

4. Adding any more, in my opinion, would be crowding the tank.

Disparity in angelfish sizes
Q. 1. A few months ago I bought three angelfish, all of the same size and age. At that time they were all about half an

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inch in size, not including the dorsal and ventral fins. Now one is as big as a half dollar but the other two are almost the same size as when I purchased them. I kept them all in the same 10-gallon tank and all were fed the same. Can you explain this difference in size?

2. How many baby guppies can be kept in a 5-gallon tank without serious overcrowding?

Tim McCallan, Broderick, Calif.

A. 1. Your larger angelfish is a successful monopolist. You will notice that as feeding time he is able to crowd the little ones away from their fair share of the food and gobble it down himself. The only thing to do is to let the small ones have a space to

themselves where they can eat to gain and be undisturbed by the big bully who has been robbing them.

2. There are many factors you have not mentioned: the most important one is, how long do you intend to keep them there? If you want to raise them to 5 gallons of water to full size, you must figure on full-size, not baby, guppies and put in no more than a half-dozen in a well-aerated and aerated tank.

Glass tubing
Q. In a recent issue of TROPICAL FISH HOBBYIST a reader wrote in and explained how he got his plastic tubing to behave. I have found a much safer method. I replace my plastic tubing with

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Gordon Patton, Raie d'Urfe, Que., Canada
A. The big objection to glass tubing is the ease with which it is broken. If you have pieces which are not going to be moved to any great extent, by all means use glass tubing. I suggest that you use the usual plastic tubing outside the tank.

Acanthodoras spinosissimus spawn
Q. According to EXOTIC TROPICAL FISHES no one has as yet spawned the talking catfish *Acanthodoras spinosissimus*.

mus. Would you please tell me if this is still true, because they spawned for me under a flat piece of stone, with a tem-

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perature of about 78° and very little light. There seem to be about 250 to 300 eggs. There were three fish in a 15-gallon tank. One of the fish was blotted, and I took this one to be a female. The eggs gave not hatched yet.

Mike Wocchener, Norwalk, Calif.
A. We did not say that no one has spawned talking catfish as yet; what we said was that we can find no records stat-



Acanthodoras spinosissimus.

ing that they have been spawned. Probably others have done what your fish have, but people don't want to write an article about it because they did not see the actual egg-laying. Congratulations on your achievement, and I hope you get the eggs to hatch successfully.

"Hungry" fish

Q. I have a 20-gallon-high aquarium which is quite heavily planted. On the left front side I have a feeding ring. I feed my fish three times a day on a variety of dried foods and frozen brine shrimp or chopped earthworms. I feel that I give my fish enough to satisfy them, but every time that somebody walks past the tank, the fish think they are going to be fed and rush over to the feeding ring. Even at times when nobody is around, they are all at the feeding ring (although it is not feeding time). I am almost positive I give my fish enough. Is there anything you could suggest for me to do?

Ed Praskan, Sutersville, Pa.
A. Many breeders tell us: "A hungry fish is a healthy fish!" As long as you are feeding the proper amount, it is much more preferable to have your fish trying to push the front glass out than to have them hiding listlessly among the plants. Then too, feeding them three times

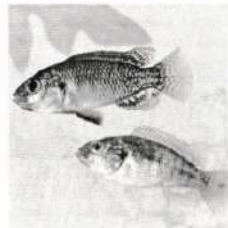
daily has gotten them used to the idea that something pretty interesting is always going on whenever someone approaches the tank. However, if it is convenient to continue feeding them as you have, by all means do so.

Egyptian mouthbreeders
Q. We have just purchased a pair of Egyptian mouthbreeders.

1. Should the male be kept with the female after they spawn?
2. How soon should you feed the fry, and what?
3. When should the female be removed?
4. How large a well-filtered tank should a pair be kept in?

Charles L. Howell, Miami, Okla.

A. I. Although he will not usually do much harm, the male should be removed from the female after spawning, as soon as it is seen that she has a mouthful of eggs.



Egyptian mouthbreeder pair.

2. As soon as you see that they leave the female's mouth occasionally to hunt for food. Newly-hatched brine shrimp are probably the best food.

3. When the female can be netted out without having any young in her mouth.
 4. If you have a tank of 15 gallons or larger, fine. Lacking this, a 10-gallon tank will do, but do not use anything smaller.

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SOCIETY NEWS

All inquiries about The International Federation of Aquarium Societies should be addressed to: TIFAS, 118 Court St., Monticello, Indiana.

Brooklyn, N. Y. . . . The Brooklyn Aquarium Society announces that its present officers are as follows: Albert J. Bruckner, President; Irving Schaeffer, First Vice President; Carmine Macchiaroli, Second Vice President; Mark Saksenberg, Treasurer. Jerry Witlin, Corresponding Secretary; Sal Scrivano, Recording Secretary; Felix Paldecki, Sergeant-at-Arms. If you wish information on this group, contact Jerry Witlin, 1407 New York Ave., Brooklyn, N. Y., Apt. 5D.

Dallas, Texas . . . The Federation of Texas Aquarium Societies (FOTAS) held their annual convention on August 27, 28 and 29. The show was judged by your friend William Vorderwinkler, who was also guest of honor at the banquet. Bill had a busy week here, making new friends and greeting old ones.

Manhattan, Kansas . . . The Manhattan Aquarium Society announces that their Second Annual Tropical Fish Show will be

held in the Community Building Auditorium at 4th and Humboldt Sts. on Oct. 1, 2, and 3, 1965. Judges will be Mr. Jim Matney of Wichita, Mrs. Betty Schank of Kansas City and Mrs. Lelia Tatman of Omaha, Nebraska. For further information write: The Manhattan Aquarium Society, 720 Bertrand, Manhattan, Kansas 66502.

Louisville, Ky. . . . The Louisville Tropical Fish Fanciers again plan to go all out in presenting their Sixth Annual Tropical Fish Show at the air-conditioned Mall, 5000 Shelbyville Road, Louisville, Ky. The show will last for 8 days, October 3 to 10, 1965. The club again invites all the school children in the area to view the movie "Hunters of the Deep," which will be shown several times a day in connection with the exhibit. A 100-gallon marine aquarium will be one of the features, along with talks demonstrating some of the side-lines of fish keeping. The Louisville Tropical Fish Fanciers Club has been highly complimented on its excellent shows in the past and expects to have entries from a number of cities within a 150-mile radius. Entries are not limited to club members. Show rules and other information may be obtained from A. L. Hayley, Secretary, 122 Dorchester Road, Anchorage, Kentucky 40223.

Hutchinson, Kansas . . . September 3 through 6 marked the annual show of the Hutchinson Aquarium Society. William Vorderwinkler was there to judge the show, sharing the honors with Mrs. Marie A. McCann of Dallas, Texas.

Atlanta, Ga. . . . A new group has come into existence, the Greater Atlanta Aquarium Society, which meets the first Thursday of every month in the Architects and Engineers Building, 230 Spring Street, Atlanta.

Painesville, Ohio . . . The Northeastern Ohio Aquarium Society has announced its first

open show for November 6 and 7, 1965. For information contact: James J. Bradbury, 7650 Acacia Avenue, Mentor, Ohio.

Concord, Mass. . . . The newly formed "Fish Nook Aquarium Society," formerly the Waltham Tropical Fish Association, elected the following officers for 1965: William D. Bright, Jr. (President), Fred Boutwell (Vice President), Martin Shea (Treasurer), and Jean Bright (Secretary). For information about joining the group, write to Jean Bright, Sandy Point Road, Concord (RFD South Lincoln), Mass.

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Guppy Corner
By Paul Hahnel

Dropsy
Q. I have 3 tanks; one 10-gallon, one 5-gallon and one 15-gallon. Some time ago I had about 50 fancy guppies in my 15-gallon tank. Now I have about 10 males left. The tank is filtered and has aeration. I feed once a day and have heaters to maintain a healthy temperature. They showed no signs of any disease yet 6 or 7 would die every day. I've tried several fish tonics, methylene blue, and mercurochrome and raised the temperature to 80° F., but nothing seems to work. Recently my few remaining males showed signs of what might be dropsy (their abdomens are puffed up), but, according to one work, dropsy is not contagious. Can you tell me what this disease is and how I can cure it? Could it be caused by bacteria and, if so, would streptomycin kill the bacteria?
Michael Fortino, Maple Shade, N.J.

A. Dropsy is a bacterial infection which easily attacks fish if they live in bad general conditions and are fed a poor diet (Primarily too much fat). A few bacteria are normal, but if these bacteria multiply, healthy fish can be attacked. When a fish shows the first signs of dropsy, it should be removed from the tank and destroyed in order to avoid the spread of the disease to the other fish in the tank. If you prefer to isolate the fish and treat it with streptomycin, you might be lucky in some cases and effect a cure.

Fungus
Q. I am trying without success to raise red delta guppies. I have recently pur-

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chased a beautiful young pair. They are doing fine but the young, as soon as they start to mature, catch a type of fungus on the edge of their fins and body. Some also get pop-eyed. Several of these fish respond to treatment, but the others don't. I can't find the cause of this problem. Water is drained off and replaced in each tank once a week; pH 7.0, temperature 78°F. Charcoal in the filters is changed monthly. Three Corydoras catfish and three algae eaters are in each tank. There is no sand, in order to make siphoning easy. There are two plastic pots in each tank with waterprie, which grows very well. The fish are given 8 hours of Gro-Lux lighting daily. Water in each tank is crystal clear. The fish are fed four times daily, twice with live baby brine shrimp. The rest of their diet consists of:

- Frozen adult brine shrimp
- .. daphnia
- .. bloodworms
- .. mosquito larvae
- Live tubifex worms

A variety of canned foods
Any help you can give me concerning this problem will be greatly appreciated.

Frank Zapf, Baltimore, Md.

A. From this distance my guess would be that the fish were afflicted with Saprolegnia, which attacks all parts of the body, even the eyes. An exact diagnosis could be made only by an ichthyologist in his laboratory. Good results in curing this fungus are sometimes achieved with a salt bath. Twenty minutes in a solution of 30 grams of salt to a quart of water or 5 grams of copper sulphate to 10 quarts of water. I hope that you made sure that your plastic plant containers are safe for aquarium use and that the canned foods you mentioned are dry foods made for tropical fishes.

Beginner wants help
Q. I am now attending Southeastern Baptist Theological Seminary, and my

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wife and I would like to begin raising fancy guppies as a hobby. Would you please send me some information on how to start or the name and address of someone I could write to concerning this. The space for equipment is pretty much limited—we have one 10-gallon, one 3½-gallon, one 2-gallon, and two 1-gallon tanks.

Davis Bowen, Wake Forest, NC.
A. The only information I could give you on how to raise guppies in the small space allotted to me is: the best environment you can provide, which would mean plenty of tank space, a large variety of food, clean conditions, and plenty of patience on your part. I would not recommend a tank smaller than 10 gallons. Write to TFH Publications for literature on guppies. The address is on the inside front cover of this magazine.

Salts From The Seven Seas



By Alfred A. Schultz
Nature in her curious way has provided marine fishes with many defense mechanisms. The list is long, and humans have adapted many similar methods for their own uses. The following is a small list of some protective mechanisms of marine fishes kept in home aquariums and corresponding devices that have been used by man.

Butterflies
Most of these fishes are equipped with a sharp knife-like lower fin. When in danger such a fish turns on its side and can inflict a dangerous wound to the attacker. (Knife and sword.) One of the butterflies has what looks like another eye on the rear of its body. A fish making



an attack upon this butterfly heads for the rear of the eye intending to attack from the rear. The false eye fools them, and they swim right past their intended victim. (Camouflage—protective-covering uniform.)

Clown fish
Their gay colors act as a lure for other fishes to come and try to devour them. Instead they swim into the poisonous tentacles of the sea anemone in which the clown fish makes its home. (Trojan horse.)



Amphiprion percula
Triggrifishes
These fishes have a bony spine in their dorsal fins. When they are in danger they swim into a crevice head

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first and cock their spines. Once this is done, it is almost impossible for another fish to pull them out. (Spears, arrows, and harpoons.)



Balistes oculatus
Jewel Fish
This fish lives among clusters of fire

coral. Fire coral, as its name indicates can cause a bad burn to humans. (Barbed wire enclosures.)

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Blowfishes

These fishes have the ability when in danger to suck in air, thereby inflating their bodies until they take on the shape of a large ball. On some of the species there are spines which stick out, and if they are caught by a fish which has a large enough mouth to swallow them they are stuck by these spines and quickly release their prey. (*Submarine mines.*)

Beau Gregories

These fishes have been known to blow a bubble around themselves upon retiring. (*Digging a fox hole.*)

Trunkfishes

Some of these fishes can give off a deadly poison, killing all the fishes near them. (*Poison gas.*)

Lion fishes

Have poisonous spines in their dorsal fins, and any fish swallowing them are soon dead from the venom. This

venom can also be fatal to a human. (*Baby traps—Land mines.*)

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Scorpæna sgra grows to between 12 and 20 inches in length and is particularly good for large aquaria. Photo by Dr. Karl Probst.

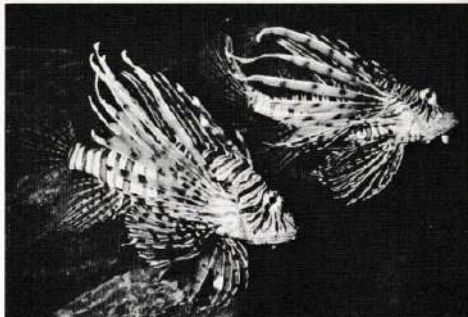


An interesting group.

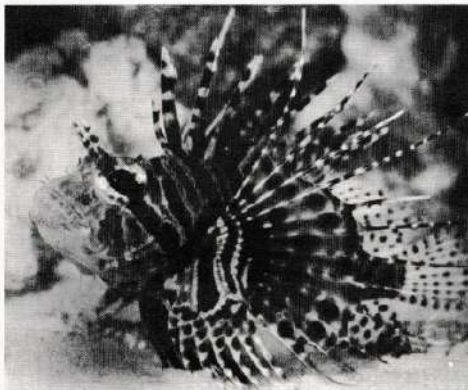
Scorpion Fishes for the Home Aquarium

BY DIPL. ING. K. PROBST
Dobersberg, Austria

The members of the genus *Scorpæna* are seldom seen in aquarium shops, in spite of the fact that other genera of the same family have been imported from the tropics (for instance, *Scorpænopis*, *Dendrochirus* and *Pterois*). The genus



Members of the genus *Pterois* are imported and kept by hobbyists more often than members of the related *Scorpæna*. Above, *Pterois volitans*. Below, *Pterois radiata*. Photo by Gunter Sanft.



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Guppies	<i>Dianema ornata</i>	Robot tetra
Arandas	<i>Cosmo amidi</i>	Flying fishes
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Because it attains lengths only up to 7 inches, *Scorpaena ustulata* is more readily kept in the aquarium of the average marine hobbyist than larger species. Photo by Dr. Karl Probst.

Scorpaena includes not only tropical species but also six species which are native to southern Europe, three of which are not at all uncommon. I saw my first Scorpion Fishes in the Aquarium Dubrovnik (Jugoslavia), and these impressed me so greatly that I decided to get myself one of these odd creatures for my aquarium.

I was soon to find that capturing a specimen was impossible without diving or without the help of fishermen. A year later I had the good fortune to get the scarcest of the three species, namely *Scorpaena ustulata* Lowe, which inhabits the West African coast to northern Spain and the Adriatic Sea at depths 100 to 2000 (!) meters. By diving on the Dalmatian coast I found two specimens in a grotto with their bellies turned up, holding fast to the clefts in the rocks with their pectoral fins. I could not touch them with my hands because of their dangerous spines and had to hurry back to land, get my net, locate the spot again and, thank goodness, they were still there. Only one became my property, however, while the other disappeared into a dark cave. My joy at finding this extraordinary fish was never forgotten. The gleaming red body is marbled brown above and in some cases covered with yellow and black patches. The black patch between the sixth and ninth rays of the first dorsal fin is also sometimes shared by *S. scrofa*, but *S. ustulata* has the smallest "horns" and no skin tabs on the chin or lower jaw. The most important ichthyological difference is that there are only 23 to 24 scales along the horizontal line. Another is that it only attains a length of 4 to a maximum of

7 inches. Later on, with the aid of a seine, I found other very similar small Scorpion Fishes which did not fit any of the descriptions, for example one with large red horns.

Scorpion Fishes spend almost all of their time lurking on the aquarium bottom or on a rock. They watch their tankmates very attentively, erecting the spiny dorsal fin and disappearing into their accustomed places in the dark spots frequently. They are not shy and soon become tame. Only when they are badly frightened do they rush blindly about the aquarium; sometimes, when there is no place to hide, they dig into the sand with the help of their spiny pectoral fins, taking on the lighter shade of the sand to a greater or lesser degree. The species which are red do not lose their color, however, despite the fact that there may not be any red surroundings.

These fishes belong to a group which is solely carnivorous and will take food only when it moves. If one throws a chunk of food into the tank they may sometimes shoot to the surface, even though they are clumsy swimmers as a rule. They always swallow their food with a single gulp. This performance is gladly staged by their keeper in the Naples Aquarium. With their huge, very flexible mouths they handle pieces up to the size of their own heads and suck them in with great force. If they fail, they lose no time looking for another piece which they can handle. One good-sized piece per day is sufficient for such a slow-moving fish, and it is easy to tell when they are hungry. At this time they follow each moving object with their eyes and one can sense that they wonder excitedly if it will fit into their mouth, all the time

An unidentified small *Scorpaena* species from Sicily, with red horns. The picture shows its good camouflage colors. Photo by Dr. Karl Probst.



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pushing water vigorously through their gills and opening and shutting their mouths. In spite of their frightening appearance they are not the wild predators that some of the older books make them out to be, because they do not have a quarrelsome nature and do not follow fishes and crustaceans that swim by just for the sheer pleasure of killing them.

In their natural waters enough passes by them to keep them comfortably fed. *S. ustulata*, to which we have already referred, forgot about this custom altogether when I once kept them in a 50-gallon tank in which among others there was a pair of salt water Minnows, *Cyprinodon californicus*. In spite of the new surroundings his eyes began to light up and he studied the little fish with a ravenous appetite. Then he stalked one with widely spread fins, making short, jerky movements and doing the whole thing so skillfully that the "catastrophe" occurred before I could do anything to avert it. As the *Cyprinodon* was a handsome male with large lemon-yellow fins and I had no desire to make a "widow" of his mate, I remembered having seen the Scorpion Fish spit out smaller fish when taken from the water. At the time this happened I remembered cursing the Scorpion Fish because some of the little ones he spat out were of a perfect size for the aquarium. Hopefully I netted out the

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Scorpion Fish. It worked. Despite the fact that everything caught is swallowed at once, the Minnow was regurgitated and swam back to his mate with no more damage than some tattered fins.

The large red Scorpion Fish *S. scrofa* is especially popular for exhibition in public aquariums. It has a range that extends from North Africa to England and the North Adriatic Sea, occurring at depths from 20 to 1000 meters, the further south, the deeper. It can attain a length of 12 to 20 inches and it was not known until recently that young specimens were to be found among red seaweed, where they had been overlooked. The species varies from pink to the color of red lead, more or less spotted with brown. The relatively small eyes are set somewhat high on the large head, and the thick upper jaw is almost horizontal. The feelers above the eyes are not much larger than the numerous skin flaps, which with this species also adorn the lower lip. A further mark of identification is that the snout is much longer than the distance between the eyes, and that there are 50 scales along the lateral line. Behavior is the same as in the others.

The liveliest species is the Brown Scorpion Fish, *S. porcus*. The range of this species extends from West Africa to England and into the Black Sea in depths varying from 5 to 50 fathoms. It is also referred to as the "Seahog" (*porcus* means "hog") and attains a length of 6 to 12 inches. Color above and on the sides is dark brown to grayish brown with darker marbled markings and black patches. The underside is pink. The body is somewhat higher, and there are two bushy brown feelers above the eyes. The forward profile of the head is steep, and the eyes are large. There are no skin flaps on the chin, and only a few on the body. The lateral line has 60 to 65 scales. I first saw this species in a fisherman's catch in the early morning hours, and several specimens had been lying on the shore, wrapped up in the net. They were still alive, and gasped at times for air. I took two and enjoyed keeping them at home for a long time. They soon became so tame that it seemed they were grateful for their lives, and in the aquarium they were never far from each other. When I approached the aquarium their large pupils glanced red, as if they were lit up from inside. To get them to eat, however, I had to tie a piece of meat to a string and let it dangle in front of their mouths. After a

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The Scorpion Fishes are not among the most active of marine aquarium inhabitants; often they lie on the bottom of the aquarium, almost motionless, for a long time. Photo by Klaus Poysson.

long period of hesitation, once a day, they would snap at it and gulp it down after frequent frightened flights when I impatiently approached too close.

Another time we pulled out a net in the Adriatic and found this species in our catch. Here I was able to see at first hand why the fishermen bite into their heads in order to protect themselves from being stung afterwards. They know exactly how to pick up a Scorpion Fish, and then I could hear the crunch of their breaking skulls.

About a half year later both my *S. porcus* were at the front glass, cycling me sadly. Next day I could see that their eyes became glazed and that they were always weaker, eventually dying within a short time of each other. It was not until later that I determined that this mycosis of the eyes disappeared quickly when they are put into different water, not necessarily freshly made-up water. I never observed any other diseases on my Scorpion Fishes. They are very hardy fishes which can be most warmly recommended for beginners if their keeper does not shy away from the fact that their feeding requires some patience. (Mine were easier to feed than, for instance, the common Sea Scorpion, *Cottus scorpius*, which belongs to the same order.)

Feeding the fish by dangling in front of it pieces of meat tied to a thread often leads to comical "fishing" experiences when the meat is tied on too firmly and the thread does not release it. Usually it comes loose when the fish is raised and dangles on the thread. The meat should always be tied on by a thin fiber, or the fish will fear being fed.

Scorpion Fishes have frequently spawned in captivity. The eggs are united by the thousands in a gelatinous mass by a thread which floats on the surface. We have not heard of any being raised successfully.