

May, 1968

tropical fish hobbyist

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AQUARIUM PHOTOGRAPHY

tropical fish hobbyist

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cover

If you have tired blood, place this month's Hobbyist cover in front of you, even a quick glance at this dynamic color photograph will send a resurgence through the most underfed aquarist's arteries. Our cover this month is a real wake-up call. And as you can plainly see, all the photography in every issue of Tropical Fish Hobbyist is the best in the world since Dr. Axelrod travels to even the farthest corners of the globe to obtain just one outstanding photo. When Dr. Axelrod first saw this month's cover shot by Colonel Scheel of 2 male fighting *Aphyosemion bivittatum*, he said, "we must show this superb color photography to our readers. . . it is our obligation and responsibility to the many exotic fish enthusiasts that we enable them to see such important work." And it was Dr. Axelrod's love for aquarium photography that prompted the idea for this special issue of the Hobbyist; he would very much like to see our readers get more involved with their hobby. The camera enables the aquarist to make permanent records of his observations, and to offer evidence of his discoveries. No more stories about the fish that got away! Besides which, the camera in the hands of a sensitive aquarist, might result in photographs of lasting beauty. The camera does enhance the hobby. Look at our T.F.H. pages . . . we've got eye-poppers.

exotic tropical fishes supplements

Pages 33 and 34, 67 and 68. These pages are perforated for easy removal and punched to fit into the Looseleaf Edition of EXOTIC TROPICAL FISHES.

rates

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May, 1968

editorial

My weekly mail averages more than 200 letters from friends and hobbyists all over the world, to say nothing of the business mail which I am obliged to answer. Though a good part of the mail is from young hobbyists with requests for help for their "Science Projects", and from advanced hobbyists who want help in identifying new varieties of fishes, I do receive some letters of complaint. The main criticism aimed in my direction is "Why do you call the same fish by different names in different books?" In nearly every case the complaint is valid!

I have written almost 100 books, having finished my first one in 1948 when I was 21 years old. At that time I had yet to take my first fish photo and I had to rely upon the usual scientific sources (New York Zoological Society, etc.) for photos. In nearly every case I took it for granted that their identification of a fish was correct. I was soon to learn how wrong I was! Unfortunately these mistakes live on forever, for even though corrections are made every few years in new editions, the older editions are still on bookshelves and in libraries. Another source of error in identification comes when I send a particular fish photo (with the fish) to an expert in the particular group of fishes to which the specimen belongs. He usually gives me a tentative identification with a P.S. that "soon I hope to revise the entire genus and this probably will not be a valid species." In the meantime, however, thousands of the fish are being imported and people want a name . . . so I use the name currently valid. Of course, as soon as the scientist publishes his revision, my identification is wrong. That's why I keep revising and editing my books, changing the names of fishes. Please forgive my apparent inconsistency and try to understand why it is so difficult to keep tabs on the names of 20,000 fishes. . . for even the specialists don't agree many times. . . and please try to understand why I can't answer every letter personally.

Herbert R. Axelrod

My Experiences With Cardinal Tetras

BY HUGO BENNINGER
BERN, SWITZERLAND

No matter how well you feed your *Cheirodon axelrodi*, they will never grow to the size depicted in this color photo; 2 inches or so is the maximum size attainable. Cardinal tetras are not really fussy eaters but they do appreciate delicacies such as live brine shrimp and freeze-dried daphnia. Photo by Dr. Herbert R. Axelrod.



If your birthstone is the ruby, then you're in luck, because these *Cheirodon axelrodi* are rubies in motion. But remember don't let their aquarium water get hard, otherwise their colors will fade. Photo by Dr. H. R. Axelrod.

The motto of the *Cheirodon axelrodi* is, "Peace on earth and in the aquarium"; they are a most peaceful exotic species devoid of any aggressive or possessive tendencies. Photo by S. Frank

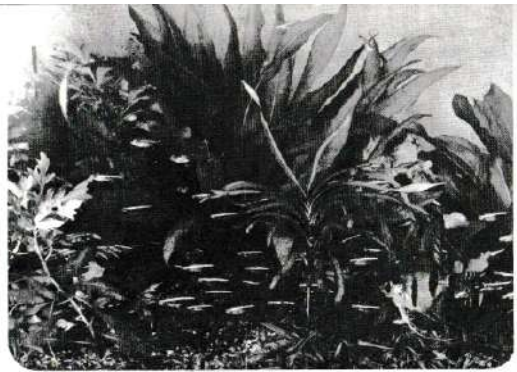


Tropical Fish Hobbyist

Years ago, when the first cardinal tetras were offered by dealers, I decided to purchase a number of the half-grown specimens in spite of their high price. According to the dealer who sold them, these were wild-caught fish. This seemed true, because they attained a size much greater than their progeny did. Besides, they were very choosy where food was concerned and even refused brine shrimp, a food which was greatly relished by the next generation. To raise these fish I keep them with breeding-size neon tetras and rasboras, feeding them with all available living foods such as daphnia, cyclops, gnat larvae of all sorts, caddis fly larvae, maggots, Grindal worms, flying insects, and tubifex worms. Dried foods were given merely as a dessert. As there were about 100 mature neon tetras, these often laid eggs. Soon the cardinals became specialists in stealing these eggs. Thus, I was often able to tell by the behaviour of the cardinal tetras when the neons were spawning.

One evening, shortly after 10 p.m., I discovered that the cardinal males were searching nervously through the tank. My first thought, naturally, was that they were on another egg hunt, but this was not usual at such a late hour. For this reason I took further pains to see what they were up to. To my surprise I saw a pair of cardinal tetras spawning. The male swam up to the female's side, and then both made a quivering one-and-a-half turn horizontally. At this time the female released several eggs. The pair then

swam apart much more quietly than neon tetras, which have been observed to swim away from each other very abruptly.



In setting up an aquarium especially for the *Cheirodon axelrodi*, key all the decor and background so that the colors of the "cardinal tetra" will jump out at you; a dark background and lush foliage are elements which will make the total image a hypnotic one.



A test of the water hardness at this time showed 14 DH. For years I have kept my breeders in pure Bern tap water. I made no exception with my cardinal tetras, in spite of the fact that I was frequently told that the water was too hard. Experience has taught me that most so-called "soft-water fishes" can be acclimated easily to medium-hard water without harming their fertility or their willingness to spawn. I have spawned thousands of fishes which were mistakenly called "problem fishes", such as *Rasbora heteromorpha*, neons, glowlight tetras, Congo tetras, and phantom tetras, using pairs which were always kept in clean tap water. When caring for my breeders, I renew a third of their water every week, and every 3 months I tear down the tank, wash the gravel until it is clean, and then fill the tank with fresh water.

The day after their spawning was discovered I separated the cardinals according to sexes. Three weeks later I undertook to spawn them in an all-glass aquarium, but I soon saw by their white, damaged mouths (the result of bumping into the glass sides) that I had chosen a tank that was much too small. At this time nothing had been published about the spawning of these fishes. For this reason I seized upon the method which had been of

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**Focus On
Aquarium Photography**

BY J. M. BELLANCA



The history of aquarium photography is still in its infancy; photography itself is only a relative newcomer to man's arts and sciences. Yet within this very short span of time, we tropical fish enthusiasts have been very fortunate, for some very fine, capable, and perceptive cameramen have already emerged from the rank and file of aquarists, contributing immensely to our knowledge and enjoyment.

We are presenting this month some of the photographic work of one of these photo-aquarists, Colonel Joergen J. Scheel of the Royal Danish Army; Colonel Scheel's ichthyological research within the *Rivulinae* (*Cyprinodontidae*) of the Old World has attracted recent attention from the scientific community. And thusly, the primary function of the photos printed on these pages is scientific, serving as visual gauges in the systematics of Colonel Scheel's ichthyological findings. Yet, even though the main purpose of these color photographs is taxonomic, one of the end results, is breathtaking visual beauty. Wow! Did you ever see such unbelievable killifish photos? This man has, with his camera techniques revealed to those who have never bothered to press their noses up against a tank to view these tiny creatures, that killifish are amongst the most "way-out" colored organisms on this planet, or any other planet.

It may come as a surprise to those who haven't as yet tried . . . but the photographing of aquatic vertebrate in glass containers isn't as easy as it may first appear; the general reader of our magazine isn't usually aware of the many technical problems involved in the shooting of aquarium photographs until he attempts to "take a couple of pictures on his own". It's at this awkward first try with the camera that our reader painfully discovers that there's a great deal of work and know-how in being able to produce a

Captions for pages 8 and 9

Top left: *Aphyosemion bivattatum*. One of the sterile males resulting from a cross between a male from Benin City and a female from Porto Novo.

Bottom left: *Aphyosemion bivattatum*. This male from Umudike, Nigeria.

Top right: *Aphyosemion bivattatum*. J. J. Scheel obtained this male specimen from Meko, Nigeria. He used Kodachrome color film to obtain these delicate color renditions and electronic flash so as to be able to stop all movement. Since strobe-lights are kvelinated for daylight, the Kodachrome film used by Colonel Scheel necessarily was of the daylight type.

Bottom right: *Aphyosemion bivattatum*. An amazing attribute of Colonel Scheel's color photography is the truly sharp delineation of even the fish's scales; they seem almost etched out. Colonel Scheel has revealed what the human eye does not usually see. The requisites of this kind of precision photography include color corrected coated lenses of focal lengths which allow for a 1:1 size reproduction.

• attention • • attention •

PHOTO-CONTEST

The June issue of Tropical Fish Hobbyist will contain all the details of our new exciting monthly Photo-Contest. There will be prizes for your photographs every month, and all the winning photographs will be published in Tropical Fish Hobbyist. If you're not already a subscriber to TFH, then get with it . . . for you'll have more and more happy surprises to look forward to when you read the world's leading tropical fish magazine, Tropical Fish Hobbyist.

"good" photograph of his prize tropical fishes, especially with some of the smaller species like these *Aphyosemion*. He then sorrowfully discovers some of the many complex problems of lighting, exposure, reflective surfaces, fish movement, depth of field limitations, color accuracy, etc., etc. At this initial stage of disappointment after seeing all the mistakes he has made in his first pictures, the novice photo-aquarist either throws up his hands in disgust and gives up entirely, or he decides to work at it more, reading all the literature on the subject that he can find to aid him in improving the quality of his photographs. That's where T.F.H. comes in . . . for *Tropical Fish Hobbyist* in the months and years to come, will devote itself to further understanding, development and improvement of aquarium photography as an integral aspect of the hobby. It will be our goal to help the average aquarist improve his own photographic techniques, thereby increasing the scope of his activities and knowledge, with the end result being a greater enjoyment from his "hobby". This magazine will simultaneously research the photographic medium for technological and esthetic advances for the purposes of effective communication while continually presenting within our pages the finest photographs currently created by aquarists from all over the world.

Colonel Scheel's color photographs should be studied carefully for they contain some answers to several technical problems that the photo-aquarist will often encounter. Notice the way he resolved the problem of a background for these dramatically colored killies: there is no busy clutter of plants and rocks; nor has he used any extraneous color to compete with the wild colors of the fish. Stark black for a background in photography makes the colors of the subject stand out to an illusion point of full saturation. Also, in using a black background in fish photography, the shape of the fish are more definitely outlined. This structural clarity is essential to scientific photography.



Why is it that our interesting American fishes such as *Lepomis gibbosus* are more popular in Europe than in their own native land? It's like the old story of the American opera singer who had to go to Paris to be discovered.
Photo by Dr. Herbert R. Axelrod.

The Centrarchidae:
North America's Rival to the
Cichlids

BY ALFRED SCHEINBERG

The old adage that states that the grass is always greener on the other side of the fence certainly seems true when dealing with the subject of native fishes. In Europe the sunfishes are popular aquarium inhabitants, but in North America, where they are most common, they are only considered worthy of the frying pan. It is quite easy to see why the Europeans are fond of sunfishes. In many ways these fishes closely parallel the cichlids and often surpass them in color and disposition. Perhaps if more were written about the care of these fish their popularity would increase.

One of the most familiar and attractive of the sunfishes is the pumpkinseed, *Lepomis gibbosus*. The pumpkinseed is common throughout the northern portion of the United States, but it can be found southward to the Gulf Coast and Florida. Although it prefers sluggish freshwater ponds and lakes, it may also inhabit sheltered areas of streams where the water is still. Fully grown adults are about 7 inches long, but smaller specimens are more

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Take a look at this beauty! *Enneacanthus chaetodon* is not from India, Ceylon or Tahiti, but is endemic to the fresh waters of the Atlantic coast from New Jersey all the way down to Florida (right in our own backyard).
Photo by S. Frank.

Elassoma evergladei is a pert addition to the fishes of southern United States. During the breeding season this mighty mite takes on the rich look of black onyx. Photo by R. Zukal.





The mating and spawning behavior of the *Nannostomus marginatus* is a marvelous display for the aquarist up until the point that he discovers that this species eats its own eggs.

Nannostomus marginatus,

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Nannostomus marginatus acting out some pre-spawning play. Photos by R. Zukal.

the Dwarf Pencilfish

BY RUDOLF ZUKAL
BRNO, CZECHOSLOVAKIA

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Even in these tiny creatures, *Nannostomus marginatus*, 'Nature's' animal reproductive forces are manifested.



Nannostomus marginatus possesses no adipose fin, but the presence or absence of this fin is not considered by certain experts to be a reliable diagnostic character of the pencilfishes.

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From the Dutch Guiana, where the spices grow, the dwarf pencilfish was brought to Germany in 1928. They were collected in jungle streams and small creeks where the water is shaded from the rays of the hot sun. This water is crystal-clear and slightly reddish-brown in color. The fish are found in large schools, often in company with other genera like *Nannodrycon*, *Hemigrammus*, *Pristella*, *Hyphessobrycon*, *Copema*, and the like.

The body of the dwarf pencilfish is short and stocky, with no adipose fin. On the sides there are three dark horizontal stripes. Between the two uppermost stripes is a golden yellow band. Near the center of this is a red dash. Besides the caudal fin and pectoral fins, which are clear, the fins, especially the male's, have blood red areas. Sex differences are easy to recognize. The male is more slender, and his colors are more intense.

The species is hardy and peaceful. I keep a swarm of these fish in a medium-sized aquarium with small plants, using tap water which is neutral or perhaps a bit alkaline and at a temperature of 72° F. Water which is too soft is not at all well tolerated. The addition of a little salt and shading from bright light is advisable. For the latter purpose some floating plants should be placed on the surface. Under such conditions, a school of these fish can be seen at their best. They can be combined with the smaller peaceful fishes. They swim restlessly back and forth and hunt for food among the plants and on the bottom.

The courting dance of the males, and frequently the entire spawning procedure, can take place in the community tank. Unfortunately the fish are very fond of eating their eggs, which they do immediately after laying them. Propagating this fish is not quite as difficult as has often been claimed; some years ago they were considered to be among the "problem fishes." The greed with which the parents eat the eggs must be taken into consideration. In a small tank filled with aged, well filtered tap water, I put a small bundle of Java moss, some *Echinodorus tenellus*, and a few plants of *Limnophila*. The water temperature was raised to 78° F. The male was introduced into this tank one day before the female was.

When he saw the female, the male deepened his colors, while the female became paler. The action began with the male chasing after the female, who tried to avoid his butting. He tried to get her from all sides and succeeded in butting her not only in the belly but in other parts of her body. Now and then the male swam into the plants and tried to lure the female there with him. When this failed, he began to chase her again. All this took about 2 hours. Then suddenly the pair became quieter. The female was no longer chased, and the male danced before her with outstretched fins, encouraging her to approach him. At this time I could observe wobbling motions by the fish as if they were signalling their willingness to spawn.

Finally the female began to search for a proper spot. While she rested against the plants for a moment, the male touched her gently in the belly

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region. She submitted willingly. Then they pressed their bodies together and some eggs were expelled. After this, they swam apart again. The entire spawning lasted several hours, but frequently the courtship of *N. marginatus* is stretched over several days. The spawning site is often changed, but the spawning procedure remains the same. Near the bottom the male approaches the female and follows her into the plants. He often touches her with his mouth, and, when the proper spot is found, the eggs are laid and fertilized.

The parents should be removed right after spawning, because, as has already been stated, they are greedy egg eaters. In my opinion it is even too late to save the eggs at this time, because they often eat their eggs as fast as they are laid. Some breeders recommend the use of a bed of glass rods. The eggs are supposed to fall between the rods, and the fish are prevented from getting at them. The eggs in many cases, however, hang on the plants or stick to the rods, and I consider the procedure virtually useless.

Before attempting a spawning I keep the sexes apart for a few days and, when the female is ripe enough, I put the pair in the spawning tank. Their behavior alone shows if a spawning is imminent or not. If things do not happen, a different male is indicated. I wait in front of the tank with a glass tube as the pair spawns and immediately pick up the eggs as they are laid and transfer them into another tank. The spawning pair do not allow themselves to be disturbed, and in this way I can gather more than 100 eggs. If one does not have the time to sit before the tank, I advise feeding the fish while they are spawning. Do this carefully, though, because the fish and the eggs are sensitive to impurities and infusoria. The tank in which you put the eggs should be shielded from the light. After 36 hours the fry hang from the aquarium sides, and on the sixth day they swim freely. They take living, fine foods. The size of the food should equal the size of the eye of the fry.

Captions for Spawning photos: reading from left to right.

- A pair of *Nanostomus marginatus* in top breeding condition. Female on top, male on bottom. Note the difference in the shape of the dorsal, and how the male's has more red.
- Now the ritual begins with the male attempting to coax the female into the privacy of the plants.
- But the female has other ideas. She figures a little more chase will increase his appreciation.
- But not too much chase, otherwise he might change his mind. She decides to decrease her resistance.
- Nature begins to run its course; the pagantry intensifies with seemingly exaggerated embraces and the flash of blazing colors.
- Part of the biological ritual is the touching of the female with the male's mouth. This signal activates a response.
- Then a wobbling, vibrating series of movements commences.
- This close-up reveals how the pair of *Nanostomus marginatus* have now become unified. Is there an underlying predetermined instinctual mechanism that is guiding their behavior through these series of stimuli and responses?
- At this final stage, the eggs should be expelled, and the reproduction of the species should be achieved.



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Q. I recently attempted a betta spawning and failed. After the male released the embrace, the female would expel a number of eggs which the male gathered. He would then add a bubble but no eggs to the nest. After the female was removed, he did not care for the nest and, naturally, no eggs hatched. How can this egg eating be remedied before the next spawning? Also, how long should it be before the female is again plump with eggs?

James Eberback, Wyckoff, New Jersey.

A. 1. By far the most frequent questions to "Bettaphile" deal with spawnings that do not go according to the standard pattern. No one has yet studied all the things that can go wrong with the spawning pattern, let alone what causes them. In your case it is interesting that the eggs were released after the embrace. In my opinion the male may not have been ready for spawning in spite of the fact that he had built a nest. It is possible that the female was introduced too soon or even too late. Next time try introducing the female on the third day after the male starts nest building and, if that doesn't work, try on the first day.

2. The female should be ripe again in 2 to 3 weeks.

Q. 1. What pH and DH should bettas be kept at?

2. What foods do they especially like?

3. How long should it take a male to blow a bubble nest?
4. Should the male be able to see the female before he builds the nest?
5. Can bettas be kept in deep water (12")? If not, can this rupture the swim bladder? I believe this happened to one of my males.

Michael Goldstein, Massapequa, Long Island.

A. 1. Bettas are very adaptable to water conditions and anything except extremely hard (greater than 15 DH), alkaline (greater than 7.8) water is suitable.

2. Any except vegetable foods are readily taken. Brine shrimp, tubifex and beef heart seem to be especially enjoyed.

3. The nest can be built in 3-4 hours, but most males take up to a day. A nest, even if not used, may be kept in good repair for several days.

4. It is not necessary. Some males over-react when the female is introduced and may damage her. Being able to see the female during nestbuilding seems to calm the male down.

5. I have kept bettas in tanks 20 inches deep with no problems.

Q. I think the addition of "Bettaphile" is great! It's about time this beautiful fish got a column of its own. I would like to ask a few questions.

1. One of my betta fry tanks is practically an infusoria culture. I am wondering if all this animal life would impair the fin development of the fry since they are far too large to eat it.

2. My betta fry are almost 3 months old and the biggest are only slightly larger than 1 inch. I feed them fairly heavily on brine shrimp and daphnia. Are they growing too slowly?

Judee Green, Weston, Mass.

A. Foul water, and that's what you have, will not only inhibit fin growth, but growth in general as your second question should show you. Good bettas must be kept in clean water. As soon as the fry no longer require infusoria, the tank water should be replaced a little at a time over a

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period of a week or two. 1 to 2 of the water should be replaced each week thereafter.

Q. My friend mated a pair of red Libby bettas. Approximately 150 fry resulted from the spawning. After three weeks, only six fry remained alive. Tank conditions such as temperature, light, pH, and food were all okay. My friend gave me the pair and I mated them with the same results. Still a third person mated them and still only five babies survived. Could the weak characteristic of the fry be inherited from the parents?

Pete Carlson, Levittown, N.Y.

A. Yes, survival rate can depend on genetic factors. You do not mention if you or your friends have raised bettas regularly. If you have not, the losses might be due to poor diet for the fry.

Q. I'm sure your column will be great just like the other columns found in *T.F.H.* I am a beginner, and these are the questions I have about betta raising.

1. Where can I obtain glass dividers? My dealer does not sell them.
2. Is a ten-gallon tank large enough for a breeding pair?
3. What plants should be used with bettas?
4. What can the young be fed? I can

obtain no infusoria.

5. At what age should the males be separated?

6. What is the best temperature for bettas?

A. 1. Try a shop which sells tinted glass. Measure the inside of your aquarium and have the glass cut to fit. Having the edges of the glass beveled will save a lot of cuts on both fish and aquarist.

2. Yes, a smaller size can be used, but a 10 allows you to keep the young in the breeding tank longer.

3. No plants are necessary, but nearly any can be used.

4. Infusoria is not obtained, it is made. Finely powdered fish food sprinkled in a well aerated gallon jar will produce an infusoria culture in about 7 days. A somewhat more convenient method is to use any of several commercial preparations which are placed directly in the breeding aquarium several days before spawning takes place.

5. Young males need not be separated until their fighting damages fins. Exceptionally fine males may be separated earlier to give them special care and food.

6. 80 degrees for general purposes, 85 degrees for breeding.

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Washington, D. C. 20560

The Smithsonian Institution and T.P.H. Publications, Inc., are pleased to announce the publication of a reprint including the color plates of the Philippine Bureau of Science's three Monographs on Philippine fishes: No. 1, Jordan and Richardson's Checklist, 1929; No. 23, A. W. Herre's Gobies, 1927; and No. 24, Montalban's Pomacentridae, 1927. These rare historical works are available in a clothbound volume for \$5.50.

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great help previously, namely, placing several pairs in an old, well-aged tank containing soft water. Newer tanks are not as good, because even in a well cemented tank there are places where uncured cement and water come in contact with each other. The new cement gives off traces of oil, making the water unusable for breeding certain species.

The water for breeding was tap water, which was softened to 8 DH. The temperature was set at 77° F., and an airstone was installed. To prevent the fish from eating their eggs, I covered the bottom with a plastic weave with openings 2 mm in width, with several bundles of nylon wool beneath.

At night I put in three pairs to spawn and then darkened the tank with a black cloth, which calmed the fish quickly. The next day I opened a small part, letting in a little light.

Spawning took place on the third night, between midnight and dawn, in what would have been total darkness to human eyes. At that time the tank stood in a room with closed shutters, and it was fully covered with the black cloth. The spawn that resulted was so well fertilized that it must be assumed that the fish were well oriented despite the darkness. Later I was able to count 220 fertile eggs and only an occasional infertile one.

The otherwise clear eggs showed a light yellow yolk, a little lighter than that of a glowlight tetra. At this time it was popularly believed that *Cheirodon azevodi* eggs were reddish in color. This is what I always had heard from breeders who used peat moss in their tanks. I decided that the reddish color could be traced to reflection from or chemical effects from the peat moss. I have bred cardinal tetras from various sources, but the eggs, as long as they were laid in clear water, never showed even a slight pink tint. A similar thing can be observed with *Cynolebia* eggs, which are quite colorless in themselves but almost brown when laid in peat moss.

After taking out the breeders I put a 25-watt fluorescent lamp behind the breeding tank in order to have a better view of the eggs. I found that there were scarcely any eggs at the bottom. So I concluded that the fish spawned freely throughout the water, not seeking out the bottom. This observation spurred me later not to use any bottom material at all. The pairs put out in such a tank spawned just as willingly. In only a few weeks the original spawners gave me over 700 fry.

Cardinal tetras are able from the first day to accept newly hatched brine shrimp. They are, however, very sensitive to water impurity. I soon found out just how highly sensitive they are. When the central heating equipment of my home was painted, an aquarium pump circulated some acetone fumes into the water. In the tanks which were aerated from this source some cardinals died, including all my breeders. In one of the tanks where the aeration was turned off, 30 youngsters survived. These were more than a year from

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their maturity. I had kept them at 76° F., which turned out to be too cool for raising them well. Later spawnings that I kept warmer grew more quickly.

After the unfortunate experience with the central heating, I realized that I was forced to look for new breeders. Unfortunately there were no more wild-caught fish to be had, only a swarm of tank-bred fish, which arrived here in sad shape. The largest individual in the group measured a little over 1/2 inch, and the fish showed little resemblance to cardinal tetras. Their fins were partly chewed off, and their bellies very hollow. With the aid of feedings of brine shrimp, sifted cyclops, and Grindal worms, however, they made a quick recovery, and 2 weeks later they showed nice colors and rounded bellies.

When they became ripe for spawning, I made several tests: pairs in 2-gallon all-glass aquaria and small swarms in larger aquaria. The swarms spawned willingly, but not those kept in pairs. However, seldom were more than 40 eggs fertilized, in spite of the fact that there were about 150 eggs laid. This did not improve when the first 30 *C. axelrodi* from my original young began to breed. The outstanding results I had had with the wild-caught fish, namely 440 fry from a single spawning with two pairs, I have never achieved since.

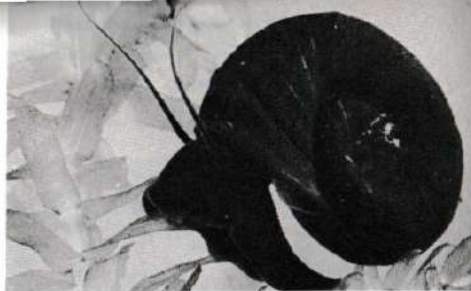
The cardinal breeders always laid their eggs during the night. Spawning never began before midnight and was always over by 6 a.m. My fish spawned in water that measured 0.7 DH and showed a pH value of 3.8 as well as in water that was almost neutral and measured 14 DH. Whether I took tap water and softened it with oxalic acid or took pond water or tap water and mixed it with distilled water, the water had no marked influence on either the eagerness to spawn or on the number of infertile eggs. From my experience the condition of the breeders is the deciding factor in their successful spawning, a fact that more and more knowledgeable hobbyists are finding to be true.



Hey man take me to your feeder!

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May, 1968



Planorbis corneus Linnaeus has a geographical range which includes most of Europe and certain areas of Asia Minor. Photo by M. Chvojka.

Snails and the Aquarium

BY IVAN PETROVICKY PRAHA-SMICHOV, CZECHOSLOVAKIA

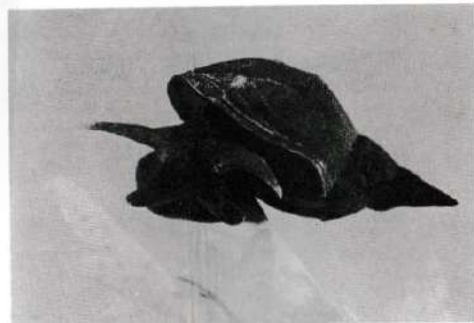
Since the beginning of the aquarium hobby, aquatic snails have been related to it inseparably. Snails belong to the phylum of the molluscs, and the branch of science which concerns itself with them is malacozoology.

The activities of snails in our fish tanks are considered by many (including myself) as favorable, with only a few exceptions, since the snails eat dead organic matter and algae growths, and thus help to keep the tank clean. They are particularly useful in a tank with very small fry. The snails eat all food leftovers that may accumulate, and thus they avoid poisoning of the sensitive youngsters through the chemicals often released into water by decaying organic matter.

The presence of snails—brought in unwittingly with some plant or other—in spawning tanks with eggs, on the other hand, may turn out to be very dangerous. In such cases the snails are apt to destroy the whole spawn or even the freshly hatched young. Some species of snails devour the fresh shoots of plants or may even cause considerable damage to the cement of aquaria with badly fitting glass panes. Besides this, under some conditions excessive snail reproduction takes place, after which eventual death of the snails in great numbers threatens calamity to the whole tank, for the decay of the snails threatens a tank just as surely as does the decay of excess food.

Some kinds of fishes are natural moderators of snail population by eating the eggs, young, or even adults. I have found that this is the case especially with *Betta splendens* and *Macropodus opercularis*. Then there are fishes, like puffers for instance, whose main food consists of snails.

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Lymnaea stagnalis Linnaeus is one of the species of snails that is indigenous to the temperate zone; its external morphology includes a long tapered tip which allows for an easier visual identification. Photo by M. Chvojka.



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The snails most commonly found in aquaria are those of the temperate zone. They travel from one tank to the next one as stowaways on plants.

The best known snail species of the temperate zone are:

1. *Lymnaea stagnalis*
2. *Lymnaea auricularis*
3. *Physa fontinalis*
4. *Planorbis corneus*

The best known snail species of the tropics are:

- I. *Melanoides tuberculata*
- II. *Ampullaria australis*

1. *Lymnaea stagnalis*

Lymnaea stagnalis has an oval shell with a long, drawn-out tip. The shell is thin-walled, brittle, moderately transparent, slightly shiny, and tortoise-shell brown. *L. stagnalis* abounds in places of low altitude such as standing waters of all kinds, river arms, ponds, swamps, and the like. The species is found all over Europe, in Morocco, in northern Asia, and in North America. It is generally introduced into our aquaria on purpose rather than by mistake. In tanks with heated water, the species does not reproduce, and it dies within a short span of time. This snail likes to graze off aquatic plants. Smaller specimens show good results in tanks with freshly hatched fry (one snail per 1½ gallons of water).

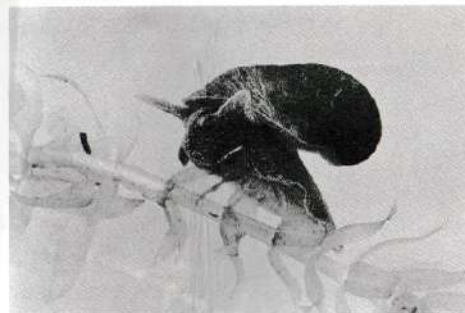
The eggs of *L. stagnalis* are easily recognized due to their elongated, jelly-like covers. The species often acts as an intermediate host for parasites that attack fishes, and therefore it is not advisable to use specimens that come from tanks with fishes of dubious health.

2. *Lymnaea auricularis*

The shell of *Lymnaea auricularis* is blown up, thin, brittle, transparent, and shiny with irregular thin rows of stripes. It is light tortoise-shell brown in color. The species is abundant in densely planted, stagnant waters, small and large ponds, and dead-end river arms. It is found somewhat less frequently in larger rivers and ditches. It seems always to prefer larger areas and rarely settles in very small bodies of water.

L. auricularis is found over nearly all of Europe and extending up to northern and eastern Asia. It also lives in North America, where, as per the technical literature, it has been carried by man. It does not do well in the aquarium, and, for this reason, it does not play an important role in the aquarium hobby. It thrives, however, in large, unheated tanks. Similar to *L. stagnalis*, it is able to transmit fish parasites.

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Lymnaea auricularis Linnaeus is a snail whose physical needs cannot be satisfied by the environment of aquarium life; consequently, this species is not very popular with the aquarist, but its interesting appearance and behavior still makes it a curious creature worth watching. Photo by M. Chvojka.



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3. *Physa fontinalis*

The shell of the tiny *Physa fontinalis* is egg-shaped, conical, blunted at the end, very thin-walled, glassily transparent, with very thin horizontal and vertical rows of stripes, and yellowish in color. *P. fontinalis* lives in stagnant and slowly flowing waters of the plains, that is in small and large ponds and ditches, and dead-end river arms. It is most commonly found between rocks just below the banks and among plants and reeds.

P. fontinalis is found over the greater part of Europe, northern Asia, and North America. It is generally introduced into our tanks by accident, and it reproduces considerably. It does no harm to plants. In the tank it withstands extremes with regard to high temperatures, low pH values, and water contamination. Its danger consists in that it easily passes unnoticed on plants which it uses as spawning substrata, where it then destroys the fish eggs deposited there in a spawning tank.

4. *Planorbis corneus*

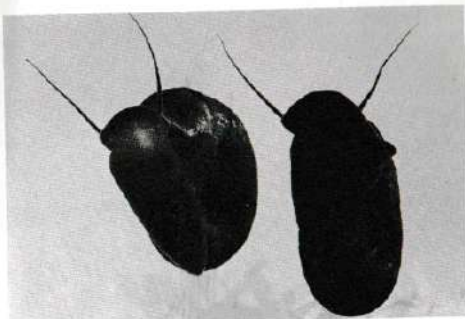
The shell of *Planorbis corneus* is thick-plated, with a funnel-shaped sunken disc and a slightly bent lower extremity. It is sturdy, slightly transparent, moderately shiny, and striped in irregular rows. The basic color is reddish-brown to ochre; on the upper side, often bluish to greenish gray with white underneath. The number of varieties of *Planorbis* is considerable, with especial emphasis on variations of size and mutual behavior. There are jumbo forms, as well as minute ones, living in smaller bodies of water... especially in periodic swamps and sanded-up river arms. The dwarf form appears currently in our aquaria. The large forms of *P. corneus*, on the other hand, are found in plant-grown stagnant or slowly-flowing waters of the plains.

P. corneus is found wild in the greater part of Europe, excepting the mountainous areas, and besides this it is found in the northernmost as well as the southernmost parts of Asia Minor, at the foot of the Caucasus Mountains, and in Siberia. The jelly-like cover of the spawn is circular-shaped, thus differing from that of *Lymnaea stagnalis*. The eggs of both species are found on the nether side of lotus plants. Like *Physa fontinalis*, *Planorbis* has been transferred from one tank to the next by accident, so that one finds the smaller form in nearly any aquarist's setup. Whatever else was said in this connection about *Physa fontinalis* is valid for this species too.

I. *Melanoides tuberculata*

The shell of *Melanoides tuberculata* is slender, pointed, and thick-walled. It is slightly transparent, shiny, and olive-drab with irregular, horizontal, reddish-brown stripes. The size range within a group of shells I examined was from 1 to 1½ inch. The foot of the snail shows a horny cover (operculum). The mouth is trunk-shaped. This snail avoids light and, in the aquarium, it lives preponderantly buried in the bottom gravel, where it eats detritus. With sudden changes (chemical) of its surroundings (also with

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Snails are members of the phylum Mollusca, and the class Gastropoda (with foot on the belly). This pair of bizarre *Planorbis corneus* Linnaeus (red rams) are in search of food, and since they are omnivorous, even fishes' eggs would satisfy their appetite. In fact, the eggs of all fishes are 'caviar' to snails; so, definitely keep them out of breeding tanks! Photo by M. Chvojka.



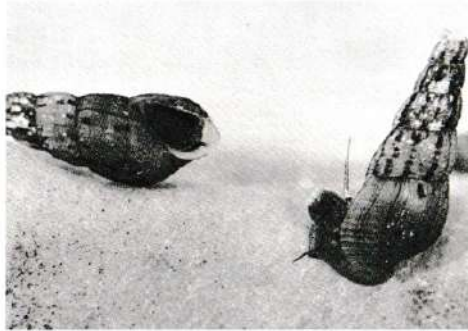
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changes of atmospheric pressure), it leaves the gravel and moves towards the surface along the glass panes. It also leaves the nether reaches of the bottom during the night hours, grazing algae growths from rocks, glass panes, and plants. The plants themselves, however, are not harmed; to the contrary, by burrowing in the bottom, the snail loosens up the gravel, permitting detritus to reach the plant roots more easily. *M. tuberculata* is viviparous and will reproduce if kept under optimum conditions. Restricting the development of the species is very difficult, for they withstand chemicals such as kitchen salt (NaCl) and copper sulphate (CuSO₄), and they are relatively safe from fish thanks to their hidden manner of living.

Despite the favorable assertions of many authors about the loosening up of the aquarium's bottom soil, one must remember the fact that with plentiful reproduction the young snails damage the glazing cement of the tank so that the whole tank is threatened with calamity sooner or later.

In less compact bottoms with thinner layers of gravel the capacity of these snails for reproducing decreases considerably, and in tanks with uncovered bottoms the snails soon become extinct. With time the snails also die if kept at temperatures below 72°F. *M. tuberculata* comes from Egypt and Indonesia.

Melanoides tuberculata Mueller is one of the species of snails that does give birth to live young. And this species belongs to the order Prosobranchia, a classification based on the character of their breathing organs (front gills). Photo by M. Chvojka.

II. *Ampullaria australis*

The shell of *Ampullaria australis* is a spheroid with a conically protruding disc. It is thick-walled, very sturdy, opaque, slightly shiny, brown to olive-brown, generally with ten striking dark brown stripes which run parallel to the windings. Many shells have two or three additional weakly visible stripes. The opening is rooky and elliptical. On the body of this snail one always finds a lid (operculum), which shuts the body in tightly when the animal retracts into its shell. *A. australis* is a lung snail, drawing in atmospheric air by means of a long, retractable siphon. This supply of air is sufficient for long periods under water.

Ampullaria australis reproduces outside the water by sticking the fertilized eggs to the tank cover or a dry spot on the glass or heater tube. In nature the same thing is done on the banks of the bodies of water and their vegetation. If the eggs are left in the tank, they often dry out. Therefore, better hatching results are achieved by scraping the eggs off with a sharp blade and placing them in a small tin basin with water, tipping the basin in a manner that makes the eggs remain on the dry part.

The size of the species is considerable; some specimens measured in captivity had diameters of 2½ to 2¾ inches. These snails, when hungry, cause considerable havoc among plants. Otherwise they are omnivorous, eating huge amounts of algae, dead fish, meat, live thread worms, and daphnia which stick to the mucus which the snails exude while moving. Larger specimens even endanger free-swimming fry. If a couple of these snails are placed in a tank that is infested with planaria, the snails make short work of them.

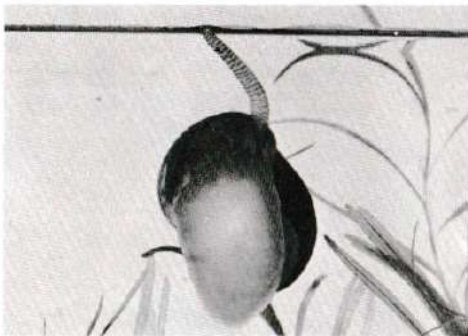
A. australis was first imported (into Hamburg, Germany) in 1904 by Christian Bruening, who was later editor of the magazine "Wochenschrift". Reportedly his specimens came from the La Plata region in South America. The German literature states that shortly after this importation, *A. australis* were bred by the German fanciers Paul Matte, Julius Reichelt, and Paul Schaern.

The name of this species of snail was subject to quite some confusion, and several authors give it different names. The first description was made by Dr. Thiel, member of the Royal Zoological Museum. He named the snail *Ampullaria gigas*. This error was corrected in 1942, when Boeger verified that it was *Ampullaria australis*. Literature shows that the species had already been studied, in 1799, when the name of the genus was found to be a synonym of the genus *Pila*, Roeding, 1798. In the same genus also were classed the Indian snails, the operculum of which is calcareous as opposed to the American species, which have a horny operculum. According to the rules of nomenclature, later on the South American species were

Continued on Page 49



Ampullaria australis d'Orbigny (apple snails) can live out of water for limited periods of time since their breathing area is divided into a gill-space and a "lung". *A. australis* d'Orbigny is warmth-loving and a lover of plants, when hungry. So proud possessors of planted aquaria, beware! Photo by M. Chvojka.



Continued from Page 49

classified under another name. In 1907 some snails reached Germany under the name *A. canaliculata*, but, fortunately, they were not recognized as an independent species.

World War I interrupted the importation of these snails for a long period, and they disappeared from European tanks. In 1935 the snails were again imported, first under the names *A. lineatus* and *A. cyclostomus*, later as *A. roesei*. But this last one was only a commercial name, given by the importer, H. Roesch. During World War II the snail disappeared from hobbyists' tanks once again. East German literature states that the first specimens reappeared in 1956 in the tanks of aquarists in West Germany, from where they have probably reached other countries through Mr. H. Haertel, a dealer in East Germany.



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Little Whiskers
BY WENDEL M. CHILTON



Well, we finally did it. My son David and I stood around one day last summer, watching the Monster of Craggy Castle (our aquarium's crayfish) and simultaneously we came to the decision that this uncouth epitome of ugliness, this colorful crustacean, this chimerical crayfish had finally earned his freedom. Besides that, he was just too big for his environment. We netted him out without incident and released him to whence he came: outside our house in the creek where it widens out into David's favorite fishing hole.

Both of us experienced a moment of sadness as he sank beneath the surface and vanished, something akin to the loss of an old friend. After all, we had raised him from practically the time he emerged from the egg. David speculated that with all those gay colors he had he would be a cinch to start a new line of underwater jewels, and I agreed that maybe this was so, but privately I suspect that he was nothing but a brilliant supplement to the diet of one of the large catfish that I know inhabit that particular area.

After that day we would stand around and watch our aquarium, and the feeling of sadness still lingered. It didn't matter that through Twiddly's efforts (we called the monster "Twiddly") the water was free from spirogyra, and the healthy fish were swimming in a media so crystal clear that it was almost invisible. It just wasn't right somehow. Everything was too perfect, too beautiful. It seems that in nature, for every beautiful thing there is something equally ugly to offset it, and now, with Twiddly gone, the aquarium was just another pretty thing, and our interest in it began to lag.

A week or two after this, David made an expedition down the creek and came back with a bottle in which was swimming a tiny catfish no bigger than a half-grown guppy. This time I didn't make any objections to the addition to our fishy community, and the cat took to it, like, you guessed it, a duck to water. As a matter of fact, some of the more ardent male guppies took to him, too, but they quickly learned that this kind of hankie pankey was entirely out of the question, and thereafter they left him alone.

With the advent of our new guest, interest in the aquarium revived, and almost an hour of the day would find some member of the family standing with their eyes glued to the tank, studying the relationship between our little catfish and the regular inhabitants. The Nielsen rating on our television set fell off to zero, and I, for one, was glad of it.

Since no one could possibly refer to a catfish as beautiful, he had restored the balance to our tank, but as an infant, he did have that delightful appeal so common to the young of practically all species. He was a rich velvety black with four tiny white barbels descending from his chin. A single black whisker extended from each corner of his mouth while two long ones sprouted from the top of his head. He looked something like a swimming inkblot with whiskers, and since everything in our house has a name, in no time at all we were calling him Little Whiskers. When he wasn't engaged in blundering acrobatics, he would swim along with his barbels dragging the bottom, pausing now and then when he sensed something that could be used to offset his insatiable appetite.

We discovered that he lacked the sensory ability of Twiddly, the crayfish, who would make a beeline for any morsel of food falling from the surface. Not so Little Whiskers. He took the hard way, search and find. It made no difference to him that a crowd of guppies would be working away at a chunk of frozen brine shrimp; he apparently didn't trust his own eyes and would go blundering along the bottom until by sheerest chance he ran into it and the guppies.

It was at about this time that people started asking questions about him, and I discovered that I knew considerably more about guppies, tetras, and bettas than I did about catfish. I found this deplorable, especially since I have been acquainted with the group since as far back as I can remember. Spurred on by this lack of knowledge, I walked into the local library and accosted the librarian, a very intelligent looking woman.

"Could you, uh, tell me, uh, where I could find some information on the uh, catfish?" I asked very sheepishly.

"You mean on how to catch them?" she replied, smiling.

Now this will illustrate my point. Everybody either knows or wants to know how to catch catfish, but hardly anybody knows anything else about them. Thoreau called the catfish a blundering idiot; Izaak Walton went into some detail about him on the same line; and some other gentlemen from a lot farther back mention him too, but to a man, they all concern themselves with: (a) How to catch him. (b) How good is he to eat once caught!

Since any schoolboy already knows the answers to (a) and (b), is this news? I had to go farther and farther afield to get any real information about Little Whiskers and his multitudinous cousins, and while I was preoccupied with research, he was very busy himself... with the problems of eating and growing.

In the matter of growth, he was completely successful, for by the time I had refocused my attention on him as an individual, he was twice the size of

my largest guppy. He had also taken up permanent residence in the castle lately occupied by Twiddly. We discovered by observation an interesting trick that little whiskers performed: If he got hold of a piece of raw beef or frozen shrimp too large to swallow and then found he couldn't release it because of his tiny gripping teeth, he would wedge it in the "V" formed by the stems of an artificial plant and go into a spin that very quickly pulled it out of his mouth.

At this juncture, I sadly pointed out to my family that our catfish's family is considerably older than ours. His family dates back some 65 million years, which is quite a long time as families go. I also informed them that he was highly adaptable and could survive in water so hot as to be uncomfortable to the human hand, and that further he was a sort of link between the true fishes and the amphibia.

David was properly impressed when I told him that Little Whiskers had more than 100,000 taste buds located at strategic points on his body, and we spent some time discussing what it would be like to be able to taste with your toes. Needless to say, we decided we prefer our taste buds in their conventional location.

It was while I was giving a learned discourse on catfishes' spawning habits and the fact that they can be found all over the world that my wife called my attention to something! "In all the research you've been doing," she asked, "Have you tried to correlate the speed of Little Whiskers' growth with the diminishing of the guppy population?"

I stood there looking at Little Whiskers blundering about with all the grace of a hippopotamus. He obviously couldn't catch a guppy if it swam right into him head-on, and he didn't know whether anything was edible until his barbels touched it.

He swam into the castle and lay there, one yellow eye staring at me over one white and one black whisker that extended out the door. I had developed some respect for him since I'd learned that his largest relative ever recorded had come out of the Mississippi weighing 150 pounds. We'd had a lot of fun watching him eat and grow, and maybe we'd all learned a little.

I thought about Thoreau and Walton and everybody, including me, who thought he was so stupid, and I admit he certainly looks that way. But I don't recommend, repeat, *don't recommend* a catfish of his type to anybody for his aquarium, because if this fish is as stupid as everyone says he is, how is it that I only have eight guppies left?



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MAIL CALL

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Spawning condition

Q. 1. Early in February I noticed that most of my egg-layers were filling with roe, and some of the males were coming into spawning color without being separated from the other fish. At the time of this writing, all but my gouramis and angelfish are full of roe. My tetras have tried to mate several times, and even my albino cat is full. Have you ever heard of this happening to anyone else?

2. As I mentioned in my first question, I have a female albino catfish that is ready to breed. I have no information on the breeding of catfish and wondered if you could advise me?

Robin Ragsdale, Louisville, Ky.

A. 1. It is not at all unusual for fishes in a well cared for community tank to come into spawning condition and even spawn right in that tank. Of course the eggs are usually eaten by the other fishes. Sometimes cichlids will defend their eggs and even

some of their fry successfully in a community tank.

2. I do not know what kind of catfish you have. There are many kinds of catfish, and they spawn in many different ways.

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Tropical Fish Hobbyist

Frustrated angel fish

Q. I am what you might call a conscientious, if small-time, fish lover. Room, time, and money for my hobby are limited, so I read a lot and heartily enjoy the small stock of fishes that I do have. This could explain why I enjoy your magazine so much. You know, armchair daredevil stalking rare tropical beauties through suitably insect-ridden tributaries of the Amazon.

But I do have a problem right now. My three angel fish are extremely tame and outrageously healthy, but undoubtedly the most frustrated fish I know. They spawn regularly and allow the eggs to hatch normally. Then their neighbors eat every last egg or fry. This is not my problem, because, heartless as it may seem, I have no room to keep a few hundred "starving children". But what can I do to stop

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these poor, frustrated lovers from ruining their lives? To feed them less would invite disease. I like them and their fry-eating neighbors too much to disturb them by moving, and pretty soon my other fish will be large and healthy enough to try breeding themselves. Is there any help?

Ted Baenziger, East Rochester, N.Y.

A. After the angels have spawned, partition the tank to keep their tankmates away from the eggs. You can easily make a partition or buy a good one ready-made at a very low price.

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May, 1968

Swordtail mortality

Q. I am an avid fish fancier and, naturally, as my interest increases in fish collecting, my ultimate goal is to breed my fish. I have four tanks, a 30-, 81-, 54-, and a 24-gallon. The 30 serves as a community aquarium, and the others are used for fry rearing.

I have, however, one problem when I attempt to breed swordtails. Whenever a female gives evidence that she is shortly ready to drop young, I place her in a 64-inch by 34-inch plastic breeding device. The female is left overnight, and in the morning I find her dead. This has happened on numerous occasions. Could you please tell me why this happens, and what can be done to prevent it?

Neal Ewanstein, Whitestone, N.Y.

A. The first thing I would do would be to be sure that the temperature and water chemistry in the tank in which you have your breeding trap is the same as the tank in which you keep your adults. Also, occasionally you run into a strain of swordtails in which the female object to confinement in breeding traps. With such fish, the best thing to do is allow them to give birth in a small aquarium that is crowded with all kinds of plants or artificial spawning grass. Feed the female well, and get her out as soon after she completes giving birth as is possible.



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A. I have seen not only red-tail black sharks but also Corydoras species and clown loaches feeding this way. I think the reason for such actions is that there is too much competition for food in your tank. Almost every fish you have can and readily does take food from the surface of the water. So, perhaps not enough food is falling to the bottom of the tank for the shark to eat, and he is forced into his unusual behavior.

Upside down lebece bicolor?



Upside-down red-tailed shark

Q. I have a red-tailed black shark about 1 1/2 inches long. I feed it frozen brine shrimp, dry foods, white worms, and other foods. In all of the books I have read, it says that these fish are strictly bottom feeders, but mine turns upside down and eats at the surface. I keep it in a 15-gallon tank with two male swordtails, a pair of dwarf gouramis, five tiger barbs, five cherry barbs, four zebra, two white clouds, a serape tetra, and a black tetra. I would like to know if this has been observed before or if it is a very unusual habit.

Rex Larsen, Oklahoma City, Okla.

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Come See Us — Soon and Often

Formica the killer?

Q. I recently bought a black veil angel from my local petshop. I placed him in my community tank, where he seemed to get along well with my other fishes.

For the first day this fish acted normally and followed the other angels around the tank. On the second and third days he kept hiding in a corner of the tank, and on the fourth day I discovered him dead. He was never bullied by the other fishes, although he was very small, about two or three months old.

The tank is of 15 gallons capacity. The temperature is kept around 78 degrees. The pH value is about 7.0, and the tank is equipped with an inside filter and aeration. I keep four small scolaras in it with 10 other small fishes and the tank is well-planted.

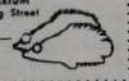
At around the time I got this black veil angel I was using a formica top for the tank until I could get a new glass one. Is it possible that this killed him; if so, why were the other fish not affected?

If the above was not the cause of the fish's death what then could have killed him?

Paul Urbanik, Westfield, Pa.

+++++
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A. I don't know what killed the new angel fish, but I'm quite sure that it wasn't the formica top. Condensation drippings that had formed on the formica and then dropped back into the tank wouldn't do any harm unless the formica itself were covered with an injurious substance; since the other fishes were completely unaffected, you can absorb the formica. It could be that the angel that died was just a sickly fish or that there was something in your tank that harmed him without hurting the other fishes because they had become accustomed to it.

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Scissortail

Q. Nothing much has been said about the scissortailed rasbora, and I have a few questions concerning this fish.

1. What is its scientific name?
2. How do you tell male from female?
3. Is it bred like other rasboras?

Donna Rogers, Glendora, Calif.

A. 1. Its scientific name is Rasbora trilineata.

2. The females are a bit longer and considerably bigger around.

3. This fish is easily spawned and follows the same general pattern as the other rasboras. After considerable drifting, the male gets the female to go into some bushy plants where he wraps his body about hers, and the eggs are expelled and fertilized.

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Rasbora trilineata

Leeches

Q. 1. While cleaning out my 5-gallon tank, I discovered two brownish worms that stretched out to be about 3 inches in length. Do you know what they are called? Could they be tubifex worms that have not been eaten?

2. What is the best food for conditioning neon tetras to breed?

David Marshall,
Toronto, Ontario, Canada

A. 1. The "worms" that you describe are leeches. Tubifex worms are generally red in color when they are healthy. Also, they do not grow this large.

2. The best food to use for preparing neon to spawn is live daphnia, and freeze-dried tubifex pressed on the inside glass about 2 inches above the gravel line. Water conditions, however, are more of a problem with this species than is food.

Osteoglossum bicirrhosum

Q. I have a small arowana which has a large appetite but seems to be doing very well. I want to know how much space should be given to him, because at the moment I have him in a 20-gallon tank with a tank divider. Could you also list some of his requirements, because most of my reference books are not sufficient.

Craig Husband, Oxnard, Calif.



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A. The arowana is one of the most interesting of aquarium fishes. These magnificent creatures should be given a tank all to themselves, for they grow quite large and love to swallow smaller fishes whole. Arowanas will grow to a length of 18 inches in a 50- to 70-gallon home aquarium and even larger in the wild. I would suggest nothing smaller than a 50-gallon tank for a full grown specimen. This fish likes a temperature range of 76 to 78° F. and should be moved as little as possible. The arowana's favorite foods are live fish, shrimp, beef heart, and strips of raw meat.

White convict cichlid

Q. What kind of cichlid is pictured in the ad for Miracle Freeze-Dried Brine Shrimp that appears on page 43 of the June, 1967 issue? How large do they

grow? Are they a good community fish? What are their food and water preferences?

G. Thomas Oliver, Farmington, Michigan

A. This fish is known as the white coverlet cichlid. It is a form of Cichlasoma facustum that was originally developed by Gulf Fish Farms in Florida. These fish will grow to 4 inches and possibly larger. Unlike the pigweed facustum, this fish is not overly aggressive if kept uncrowded and with fish of approximately its own size. White coverlets will eat just about anything, including dog food. However, they thrive on freeze-dried foods. Water chemistry is not critical, but water temperature should be between 75 and 80° F.

Beginner's blues

Q. I started in the hobby 2 months ago. I set my aquarium up according to directions, and all went well for awhile. Now, suddenly, within a week, I have lost two neon and two platies.

- 1. Can you tell me what could be happening?
2. Before I lost one of my platies, she had her fry. There were six, but they all died almost instantly. I used a breeding trap which keeps the mother in a V-shaped section out of which the babies can swim. I think the fry couldn't get up past the V to get air, so they died. Is this possible?
3. I am having so much trouble with my fish, and I can't find anyone to help me. Do you know of any tropical fish club in my area that I can write to?

Gayle Belk, Vallejo, Calif.

A. I wish nothing but the fact that the fishes died to go on, I can't even venture a guess. But I would urge you and all other beginners not to let a few setbacks upset you too much. Certainly don't let them discourage you to the point that you are ready to quit the hobby. It is the rare beginner that doesn't run into fairly serious trouble at first.

Not-so-black tetras

Q. I have a problem. Recently, I noticed that one of the airstones in my aquarium was not bubbling. When I removed it, I immediately saw that the tube was filled with a white substance. On examining it, I found it extremely hard. I had to remove it with a knife. What is this substance and what causes it to appear?

2. In the March '67 issue of TFH, on page 45, the caption above the picture of black tetras states that until the fish grow quite large their markings and fins are black. I have two of these fish which are both about an inch long. Their markings and fins, however, are grayish and are duller than the silver of the rest of the body. Why is this?

Roland Mandler, Jr., Bucksport, Maine

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A. 1. This substance is a deposit of the materials that are normally dissolved in your tank water and which make it hard. While the stone is not working, the tube fills with water. Then when air is forced through the tube, a small amount of water remains in the tube as a film on its inner walls. The movement of the air evaporates this film leaving behind a minute amount of the mineral that were dissolved in it. Each time this happens an additional quantity of this mineral material is left in the tube, and finally the tube may become completely blocked as yours did.

2. When I wrote that caption, I assumed normal growth for a black tetra. The color fading is actually the result of the fish aging rather than growing, and a large black tetra is usually a fairly old black tetra. Your fish may not have grown as well as they might have, but they may be old enough to have their color fade. Also, your water conditions or some other factors might not be to your fish's

liking, and this may be causing their dull coloring.

Gymnocorymbus ternetzi



Cloudiness from home-made foods Q. I have been a regular reader of "Mail Call" since I started to receive TFH about three years ago. I do hope that you will be so kind as to help me with my problem.

I feed my broad tail guppies newly hatched brine shrimp, dry food, flake food, Miracle freeze-dried foods, etc.

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My problem concerns the paste food I make and freeze myself. I make it from 2 jars of beef baby food, 1 jar strained carrots baby food, 1 7-oz. can cooked spinach, 2 tsp. Splifl flake food, 2 tsp. wheat germ, and, lastly, 2 envelopes of unflavored gelatin. I blend this mixture and then freeze it. When feeding, I chop it into small clumps and thaw.

How can I stop this food from clouding the water? Should I eliminate something, or perhaps change one ingredient for something else?

My fish love this food and have grown well on it, but the clouding is very bad. What do you think I should do?

George R. Christ, Bronx, N.Y.

A. A number of the ingredients you're using are guaranteed producers of cloudiness, with the beef baby food probably leading the others in the Murkinness Hit Parade. You're better off not playing around with home-made foods at all.

No room

Q. I have a pair of zebra danios. The female is loaded with eggs. I do not have a place to breed these fish. My parents will not let me get another tank. What should I do?

Nick Vlasovich, Chicago, Ill. A. You could spawn them in a small container floating in the community aquarium in which they now live, but then you still wouldn't have any place in which to raise the young properly. I'm afraid without another tank you had better not spawn your fish.

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By Paul Hahnel

Strange Malady

Q. We have a problem in our tanks here at school with a fancy strain of guppies that is becoming quite serious; these particular fish (young and old) have been developing a humped back deformity and then dying within a month's time from the initiation of this odd appearance. We here are all stymied as to the cause of this strange malady, since we consider the tank conditions under which these fish are kept to be most ideal: a 20 gal. tank whose steady temperature of 76° F. is thermostatically controlled and whose filtration is via an undergravel filter; proper plant care and regular cleaning schedules; a variety of foods in their daily diet including dry food, live brine shrimp, freeze dried tubifex, and some liver or salmon egg meal. Could it be that this fancy strain of guppies has been "over inbred"? Would you then suggest crossing them with another available strain? Or is it possible that the daily diet we have

prepared for our guppies is not as perfect as we believe—maybe a vitamin deficiency does exist?

Bill Teifke

Bloomfield Hills, Michigan A. As far as I am able to determine, you are properly caring for the well being of your guppies. But even though your description of their diet sounds sufficient, there is the chance that a nutritional deficiency does exist. I add a small amount of calcium-phosphate to my dry foods so as to safeguard against a mineral deficiency, which may be the main cause of your guppies' problem. And a slightly higher temperature from 78° F. to 80° F. would help. Also do not allow those deformed fish a chance to multiply; keep only the well formed ones. If you have one humped-back in 50 to 100 fish, that is normal.

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Tank Size

Q. I have two pairs of vital guppies separated in an 8 1/2 gallon Betta tank. I also have two spare 5 gallon tanks and a 10 gallon tank occupied by 3 different ages of baby guppies—about 100 babies altogether. But my baby guppies don't seem to be getting big enough, so I am going to buy a 50 gallon tank to allow them more room to mature.

1. Do you think this tank size a wise choice or what tank(s) do you recommend that won't cost too much?
2. How do I get to purchase some of your prize-winning guppies?
3. I really appreciate T.F.H. and Guppy Corner.

Lewis Corn, Bakersfield, Calif.
A. 1. Rarely, do I advise the use of small tanks. My preference is for the larger capacity tank of 10 to 23 gallons. One-hundred babies at 3 different ages are too much for a ten gallon tank. If you want to go through the expense of buying a 50 gallon tank, I'm sure the fishes won't object! But really, that large of a tank is mostly

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- used for the larger fish such as cichlids.
2. I'm very sorry, but I do not ship my fish through the mail.
 3. Thank you kindly!

Losing females

Q. I have been breeding guppies for quite some time, but recently I have been losing a great many of my females. The water's temperature is kept at a steady 72° F. Its pH is slightly alkaline. The fish are fed four times a day on Gordon's formula. Females about to die in a few days remain motionless on the bottom of the tank and move only when fed. After they die a brown liquid-like stripe appears on their stomachs. Please advise me on the cause, cure, and prevention of this disease, as I am most anxious to resume breeding my fish.

Glenn F. Helfner, Massapequa Park, N.Y.
A. You are keeping your guppies at too low a temperature. Maintain a temperature of 76 to 78° F. A slightly acid pH would be best, but it is not necessary for you to try and change this. Feeding only one type of food is not sufficient, try to vary your guppies' diet as much as possible. I have never seen on any fish the symptoms you describe. Follow my advice on the temperature and feeding, and keep your tanks in first-class clean condition, and you will not encounter such problems.

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Salts From The Seven Seas

By Alfred A. Schultz



Q. The heating system of our house keeps the air very dry. As a result a great deal of water evaporates from my marine aquarium. I use artificial salts to mix up the water with which I replace what has evaporated. I make it up very carefully and measure its salinity to check to be sure everything is exactly perfect. This is the only water I ever add to my tank. Despite this, I find that the salinity in the aquarium is gradually increasing. I know that nobody is adding salt to the water. What is the trouble?

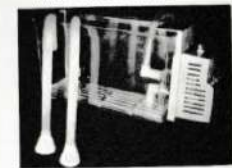
Chester C. Goodwin, Miami, Fla.
A. When water evaporates from your tank, it goes into the air without taking any salt with it. Thus, all that is necessary

to keep the salt at its original concentration is to replace the evaporated water with fresh water. You are increasing the amount of salt in your aquarium each time you add water to which salt has been added. Salt water should be added to your tank only to replace water you have taken out of the aquarium, never to replace water lost through evaporation.

Q. In order to filter my 50-gallon marine aquarium effectively, I recently purchased a Miracle Hydramatic power filter. It moves a tremendous amount of water, but I am worried that the metal magnet to which the impeller is attached will let metal that will kill the fishes get into the water.

P. L. Dillman, Los Angeles, Calif.
A. The magnet that you are speaking of is made of a ceramic material, not metal. It looks like metal, doesn't it? Modern science has created some pretty wild new materials.

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Q. I am going to set up a marine aquarium. Is a hydrometer, filter and airstone absolutely needed?
Jeff Page, Momence, Ill.
A. A hydrometer is needed to test the salinity of your water, and unless you have an extremely large tank, I would say that

a filter and an airstone are absolute musts. With the price of marine fishes, why skimp on the items that cost the least.

Q. I recently purchased a fish which my dealer called a yellow-tailed angelfish. To me it looks like a butterfly fish. It has a sort of an orange tail and a single dark line running down from its head, through its eye, to the bottom of its mouth. The body is gray in front and turns to chocolate-brown at its tail. Can you identify this fish for me?

Lester Gault, Niagara Falls, New York
A. From your description, the fish you describe is *Chaetodontoplus mesoleucus*, and it is called the yellow-tailed angelfish. It is a member of the butterfly family.

Q. When setting up a saltwater aquarium why would it not be better to have no sand or anything on the bottom? Couldn't you keep your aquarium cleaner if you could see any dirt or excess food on the bottom? Is there any necessary function performed by the bottom medium?

Dick Horwitz, St. Louis, Mo.
A. White silicate sand is much nicer looking than the black flats of an aquarium. Also, dirt and uneaten food is usually much easier to see on a white bottom. Of course, if you use an under-gravel filter, sand or gravel become a necessity.

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Continued from Page 12

suitable for home aquariums. The most desirable trait of the pumpkinseed is its spectacular coloration, with dots and splashes of gaudy hues. Although subject to great variation, the basic color is an olive-green, shading to a purple cast on the sides, which are frequently dotted with orange and yellow. The belly is a bright orange-yellow which is also the shade found on the fins. Finally, the gill flap is adorned on the edge with a bright scarlet spot and the cheek is orange-tinted with contrasting wavy blue streaks. The total effect is somewhat similar to an abstract painting of the sunset.

Lepomis gibbosus has a ten-spine dorsal fin, three-spine anal fin, and one-spine and five-soft-ray pelvic fins. Its temperature requirements are rather flexible, with a range of between 40-70° F. easily withstood. The diet of this fish in nature is composed mainly of small crustaceans, minnows, plants, snails, worms, and insect larvae. In captivity, it seems to favor tubifex worms. For best results, tanks containing pumpkinseeds should be densely planted, and floating plants are appreciated.

Perhaps the most popular sunfish with aquarists is the tiny black-banded sunfish *Emmeacanthus chaetodon*. This fish ranges from New Jersey to northern Florida. It is one of the smaller sunfishes, adult size being only 3 inches. This sunfish too is most attractively colored. The basic shade ranges from silver to yellow, with a speckling of black dots and six to eight irregular vertical bars. The first rays of the ventral fin are orange. As with most species, the females are less brightly colored than the males. The black-banded sunfish prefers water of from 60 to 70° F. and will tolerate less variation than will the pumpkinseed. The ideal pH is about 6.0. This fish, and many of the other sunfishes, needs strong aeration. Perhaps the most problem in keeping this little fish is that it is very prone to fin fungus.

The smallest of the sunfishes is *Elassoma evergladesi*, popularly known as the pygmy or dwarf sunfish. Essentially a southern species, the pygmy sunfish inhabits warm waters from North Carolina to Florida. This necessitates higher temperatures in the aquarium, with 60 through 75° F. most suitable. The coloring of this species ranges from light to dark olive, turning to black during the breeding season.

Another rather poor community fish is the long-car sunfish, *Lepomis megalotis*. There has been much confusion on the classification of this fish and it is often incorrectly referred to as *Xenotis megalotis* or *Lepomis pallidus*. Still more confusion arises from its close resemblance to the pumpkinseed. However, it may be distinguished from the pumpkinseed by its noticeably longer "ear" which bears a narrow red margin, not a spot as in the pumpkinseed. The long-car is common in the central United States, especially in streams throughout Kentucky. A size of 6 inches is not uncommon, although smaller specimens are more abundant. The general background color is a brilliant blue streaked with orange spots and wavy lines. Tem-

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peratures between 50 to 70° F. are adequate.

One of the most even-tempered sunfishes is the redbreast, *Lepomis auritus*. This fish thrives in lakes with dense bottom vegetation; and prefers the warmer lakes south of New York, although it may be found north to Maine. Due to its wide range, this fish can withstand temperatures between 40 to 70° F. More elongated and thinner than the pumpkinseed, this fish is olive-green to golden-brown, with a rosy-red belly, black elongated ear flap, and touches of blue in the scales. A rather large fish, it reaches an adult size of up to 8 inches.

Other sunfishes, notably the blue-spotted sunfish and the bluegill, may be kept in the home aquarium, but usually with less favorable results. It is best for all but the experienced aquarist to choose one of the species mentioned earlier.

Undoubtedly one of the most fascinating characteristics of the sunfishes is their unusual way of breeding. The male does the hard work, as he builds a nest on the sandy bottom of the water by brushing aside soft materials on the bottom with his tail until he finds pebbles, rocks, or other objects to which the eggs will stick. Nests may be rather isolated or in colonies, depending upon the species. The male spawns with one or more females in the nest and then drives them away. Then the male remains and guards the nest and the fry until they have absorbed their yolk sacs.

The fish may breed more often than once a year. The eggs hatch in one or two days, and the mortality rate among the fry is rather low. Sexual maturity is reached in a year under normal conditions.

Different species of sunfish will often interbreed, even in nature, and the resulting hybrids are primarily males which grow more rapidly than the parent species but are usually sterile.

A few species vary slightly from the typical breeding pattern. The pygmy sunfish females lay eggs in nests of plant pieces on the tank floor. The males will guard the young, but they may eat them. Thus it is advisable to separate them from their fry in the aquarium. The eggs of the black-banded sunfish hatch in 3 days and there may be up to 400 of them. Although the male guards the nest as in most species, the female oversees the male.

The diets of sunfishes, unless otherwise noted, may be composed of foods similar to those fed to the cichlids: animal-base dried foods, shredded beef and shrimp, daphnia, and brine shrimp. Most species are hardy eaters and are easy to please.

The sunfishes make interesting denizens of any aquarium. Besides, they have the added advantage of being excellent subjects for the frying pan if they grow too large for their accommodations. Why not take a tip from our European cousins and import our export?



Look again! Powl #%\$#el Any questions? No, this fish wasn't born this way; old age is responsible for the rather strange forehead formation on *Hericthys cyanoguttatus*, the only cichlid who decided to take out American citizenship papers. Actually, *H. cyanoguttatus* is the only cichlid that can be found in the U.S.A. It is part of the interesting biota of southern Texas. Photo by Dr. Herbert R. Axelrod.



Even all of the diamonds in King Solomon's mines do not have the dazzle that this one little *Enneacanthus gloriosus* has to offer. This species lives in eastern coastal waters, so it is considered a cold water species which should not be kept in a heated aquarium. Photo by Dr. Herbert R. Axelrod.

We American aquarists should stop being strangers in paradise; surrounded by unique and intriguing fishes such as the banded sunfish *Enneacanthus chaetodon*, we hold up our noses, and look to other countries for aquarium potential. Let's enjoy the species of other lands but let's also explore the diversity and breadth of the U.S.A. Photo by Timmerman.



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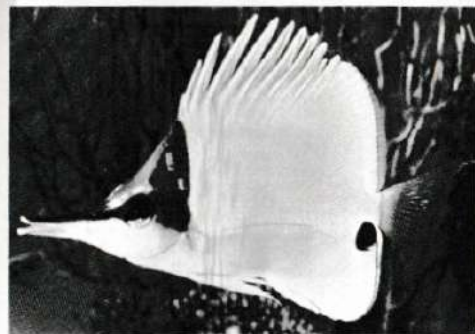
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Forcipiger longirostris, with his nose for news, would make an excellent reporter for the underwater world. But the main function of Mr. Buttinsky's snout is probably to better enable him to get into the coral crevices when he's seeking out food. Photo by Marcuse.

The Long-Nosed Butterfly Fish

BY GERD VOLKEMER WEST GERMANY

When the conversation comes around to the long-nosed butterfly fish, *Forcipiger longirostris*, ancient saltwater aquarists shake their gray heads, and even experts write about the great difficulties involved in keeping the fish and adapting it to captivity. The fish's outer looks alone, enhanced by the strongly lengthened snout, are sufficient to lead one to the conclusion that this fish must be a demanding fellow as far as food is concerned. Add to this that unfortunately the species is only seldom imported, and you will be able to understand the prevailing opinion, for, so far, only a very few aquarists have had the chance of gathering practical experience with the species.

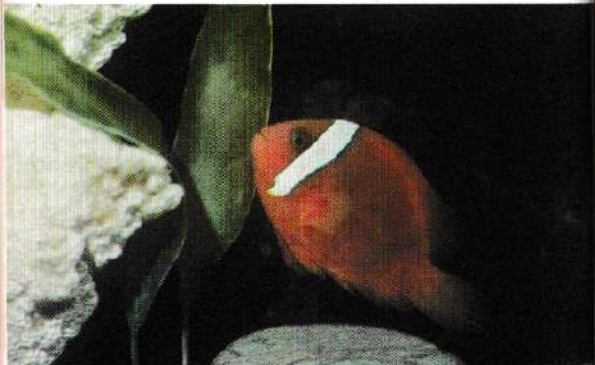
Of course, I too leaned towards this opinion up to the day, a few years ago, that I visited Marineland of the Pacific, the great aquarium show in California. Of course, there are other, more sensational things to report on in Marineland than the presence of *F. longirostris*. However, my objections to some day keeping this marvelous fish myself were dissipated that day. Saying this, I state only half the facts, for I was facing the living proof (or proofs) that the species *must* be easy to keep in captivity. The fish—there were three or four specimens—swam together with some chaetodons, and

Polynesian Salt Water Species



Acanthurus achilles is "Romanesque" in appearance, and especially impressive when seen at mature size, which is about 10 inches. Photo by Dr. Herbert R. Axelrod.

Some aquarists believe that fishes, such as *Amphiprion ephippium*, are proof positive that the salt water species outshine, outgrow, outcolor freshwater fishes. What do you think? Photo by R. Zukal.



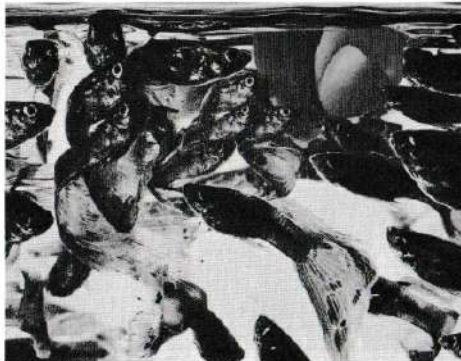
This Polynesian triggerfish with its pearl white edging is a real scene stealer. If you decided to maintain an aquarium for this triggerfish, or any member of the family *Balistidae*, a very large tank would be necessary, since most of these species attain large dimensions—from 9 to 20 inches. Photo by Hansen.

Through marine biogeography we have become more aware of the relationships between the environment's physical characteristics and the distribution "patterns" of the species. All of these marine fishes, including *Forcipiger longirostris*, can be found in Polynesian waters. Photo by Dr. Herbert R. Axelrod.



Tropical Fish Hobbyist

Photo by Terrell-Hoover, West W. Germany



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the relatively-easy-to-keep tangs (doctor fish) in a 15-foot tank which offered a replica of the coral gardens of Hawaii. The *longirostris* impressed me as pronouncedly vital and lively. If the fish behaved in this manner in these surroundings, they could not be very choosy as to feeding, as per current reports, for in such a jumbo tank with its large number of fishes it is practically impossible to serve one kind of fish from a special menu. Well, all this passed through my mind at the time and strengthened my resolution that at the first chance that offered itself, I would dare to try keeping this gorgeous fish.

F. longirostris is a member of the chaetodon family, and it grows to a length of about 8 inches. Its caudal and pectoral fins are transparent. All its other fins are yellow, and the anal fin, near the caudal peduncle, is beautified by a black dot. The body glows with a golden-yellow hue that is relieved by a velvety black mask. The mask starts at the height of the insertion of the pectorals and covers two thirds of the head and eye as well as the upper third of the snout. The lower part of the head, together with the remainder of the eye and the tip of the "bill," shines in a bluish silver. Something especially striking is the color border of the black mask, which passes through the eye.

Bizarre coral landscapes such as this are "everyday" home grounds for our equally bizarre friend, *Forcipiger longirostris*.

