

February

TROPICAL FISH HOBBYIST

DOMESTIC 40c / British Isles 3/-



Butterflies

... in the aquarium,
of course!

tropical fish hobbyist

Vol. XVII, February, 1969 (1968) No. 2

contents

Butterflies . . . in the aquarium, of course!	4
It Could Happen to You	17
A Rhodesian Hobbyist Reports	24
Aequidens itanyi	33
Corydoras schultzei	36
Spawning Pseudotropheus tropheops	94

Bettaphile, 12; Guppy Corner, 57; Salts from the Seven Seas, 60; Mail Call, 69; Photo Contest, 99.

cover

Dr. Herbert R. Axelrod
President, Executive Editor
William Vorderwinkler
Publisher Emeritus
Neal Frenck
Managing Editor
Dr. Leonard P. Schultz
Advisory Editor
Dr. A. Viggo W. Schultz
Translations Editor
Paul Petzke
Art Director
Sam Seldner
Production Manager

Nice to look at, interesting and educational to keep, peaceful at marine fishes go, belonging to a highly variable group that contains many body shapes and color patterns . . . they're the butterfly fishes, among the favorites of all marine hobbyists and very definitely the salt-water favorites of Dr. Herbert R. Axelrod. Do some exploring of the coral reefs with Dr. Axelrod as his "Butterflies . . . in the aquarium, of course" article, aided by the truly magnificent color photographs of Dr. John Randall, shows you exactly why many members of the family Chaetodontidae have reached the plateau of popularity they currently enjoy among marine hobbyists. Chosen to represent the family on the cover is *Chaetodon lineatus*, a distinctively (although not brilliantly) marked species that comes from deeper waters than its close-to-the-reefs relatives. Photo by Dr. John Randall.

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

40¢ per copy in the U. S. \$ 40¢ per copy in Canada or foreign \$4.00 for 12 issue subscription in U.S. Add 60¢ per year for foreign subscriptions. Index available in every 12th issue.

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 13 Rutley Lane, Brigate, Surrey, England. All subscriptions and inquiries should be sent directly to them.
© 1969 T.F.H. Publications, Inc.
Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc. at 245 Cornelison Avenue, Jersey City, N. J. 07302. Printed in U.S.A.

February, 1969

editorial

It's nice to see that after many years of being treated like pariahs in our tanks, *Corydoras* catfishes seem to have come into their own. Long regarded strictly as scavengers, to be kept mainly for their supposed value in cleaning up food leftovers in a tank, they are currently being given more recognition for what they are: interesting, hardy, peaceful aquarium specimens that deserve at least as much attention as has in the past been given to much more colorful . . . yet far less interesting---species. You've probably noticed that dealers are beginning to stock a greater variety of *Corydoras* species and are also separating one species from another in their display tanks, instead of jumbling them all together in one "mixed catfish" tank. This is a sure sign that interest in the group is increasing. To the extent that hobbyists' increasing awareness of the pleasures of owning some of the comparatively drab fishes (and most of the *Corydoras* species are drab when contrasted with the more popular aquarium mainstays) pre- sages a more mature outlook in which fishes are valued more for their actions than for their colors alone, it's a good sign for the hobby.

The *Corydoras* never really were great shakes as "scavengers," although they are pretty good at rooting out live tubifex worms that have become entrenched in the gravel and they do stir up filterable material during their periodic mad dashes around the aquarium, so let's wish them good luck in the new non-housekeeping role they've recently been playing in our aquaria.

Neal Frenck

Butterflies in the aquarium, of course!

BY DR. HERBERT R. AXELROD

Photos by Dr. John Randall

● Everybody has a favorite something. Every hobbyist has a favorite fish . . . or family of fishes. I like Butterflies . . . Butterfly fishes, that is. I like them because they have everything a hobbyist could want in a marine fish. They have the most diversified coloration of any group of fishes I can think of quickly. They are the most peaceful, as a group. They are relatively hardy and easy to collect or buy. They are very, very interesting. They are extremely easy to photograph. But they might be difficult to sex (perhaps impossible in many cases) and feeding them might prove a problem.

Chaetodon lineolatus Cuvier. A 7.3 inch specimen from Hawaii. Photo by Dr. John Randall.



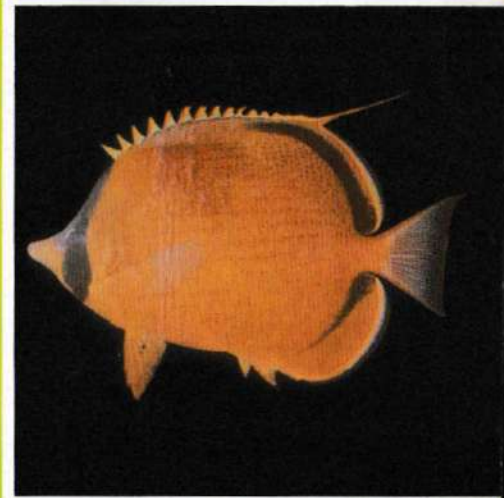
Pterapogon kauderni Bleeker. A 3.8 inch specimen from Eniwetok. Photo by Dr. John Randall.



A few years ago I had the great fortune to meet one of the world's most capable ichthyologists, Dr. John Randall. "Jack" Randall has written many books and articles (his latest masterpiece is "Caribbean Reef Fishes") and besides winning a Phi Beta Kappa key, he also won a letter in skin-diving. Unfortunately, my school (NYU) didn't give a course in skin-diving! I can say without fear of contradiction that Jack Randall takes the most beautiful photographs of marine fishes. He has the largest library of fish photographs. He also has the most well-identified collection of fish photographs because he only photographs fishes which he preserves in formaldehyde and carefully checks the preserved specimen to be sure it's what he says it is. He is a very careful worker and we hope that his photos will grace the pages of *Tropical Fish Hobbyist* for a long time, since we now have publication rights on hundreds of them!

I asked Jack to collect and photograph all the Butterfly fishes he could get his hands (or spear) on, and he has done a remarkable job. By the time he finishes, I'm certain he will have photographed most of the fishes in the

Chaetodon vagabundus Linnaeus. A 5.3 inch specimen from Tahiti.
Photo by Dr. John Randall.



Chaetodon semeion Bleeker. A 7.1 inch specimen from Bora Bora.
Photo by Dr. John Randall.

Family Chaetodontidae which includes the genera *Forcipiger*, *Hemichas*, *Parachaetodon* and *Chaetodon*, among others. It also includes the sub-family Pomacanthinae.

All the Chaetodons have deeply compressed bodies which means they are much thinner than they are thick. They have moderate scales with well developed dorsal and anal fins which also have some scales on them. They have very fine (meaning *small*) teeth which are like bristles rather than needles. If you think about it, they have nice round tails, never forked tails. The young are often very different from the adults which has caused lots of problems with earlier scientists who often called various stages in the development of a fish by a different scientific name.

Chaetodon citrinellus Cuvier. A 4.1 inch specimen from Eniwetok.
Photo by Dr. John Randall.



Chaetodon quadrimaculatus Gray. A 4.9 inch specimen from Tahiti.
Photo by Dr. John Randall.



Chaetodon unimaculatus Bloch. A 5 inch specimen from Bora Bora.
Photo by Dr. John Randall.

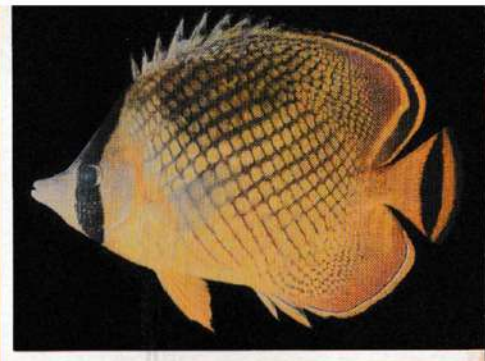
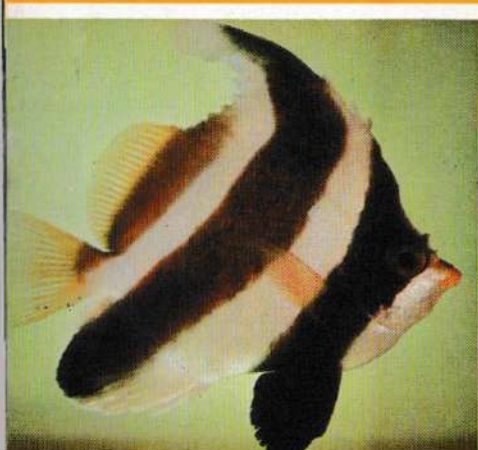
Tropical Fish Hobbyist

They have little protection besides spines on their gill covers which disappear slowly as the fish gets older. One or two spines, though, are found on almost every *Chaetodon's* gill cover.

I don't know exactly how many *Chaetodons* there are, but a safe round number would be 200. They are especially abundant in the Indo-Pacific, though 10% of them are found around South Africa and a few can be found in Florida. There isn't a public aquarium worth its name that doesn't have a special tank for Butterfly fishes . . . and they do require a special tank.

Butterfly fish are peaceful. They are not aggressive and they would rather starve than fight for food, which is what they do when kept with more extrovert fishes. While they love live brine shrimp more than any other food, I have had great success with feeding them canned Norwegian brine shrimp and freeze dried brine shrimp. Once they begin taking freeze dried Tubifex with *Chlorella* algae, your problems are over and they will never starve again! I had lost many *Chaetodons* when I kept them with fishes which chased them

Heniochus permutatus Cuvier. A 6.8 inch specimen from Eniwetok
Photo by Dr. John Randall.



Chaetodon rafflesi Bennett. A 5.8 inch specimen from Samos.
Photo by Dr. John Randall.

Continued on Page 85

Chaetodon ornatissimus Solander (in Cuvier). A 5.7 inch specimen from Tahiti.



Bettafile

Frederick J. Kerr

Conditioning

Q. I have been a hobbyist for about six years. I receive *Tropical Fish Hobbyist* each month. Recently I attempted spawning bettas and failed. I believe the female was not ready. Will you please tell how you condition your bettas?

E. J. L.

Worcester, Massachusetts

A. My bettas are not conditioned in the sense that they are not fed more or different food than usual. I feed frozen beef heart and frozen adult brine shrimp.

There are many reports from breeders who use only one or the other exclusively with success. In general, males build nests within seven days of being removed from nest tending. Females seem to require about two weeks from one spawning to another with two moderate feedings a day.

Dead Fry

Q. I have recently bred two bettas. When the eggs hatched and the fry were free-swimming, I took out the male. Now all the fry are lying on the bottom. Is this a common occurrence, or are they dead due to an over-amount of food?

Curt Perry
South Bend, Indiana

A. If they are not moving they are dead. Baby bettas are not given to remaining motionless for any length of time. I am not sure what you mean by "an over amount of food." If you mean are the fry eating too much, I would say no. They tend to congregate in midwater when full of brine shrimp. If you mean is there too much infusoria, I would say that it is possible to put too much of a bacteria-ridden culture in the tank. This might cause the fry to go to the bottom or even kill them.

Disappearing Fry

Q. Recently I had a spawning of bettas. When I removed the female, I dropped an infusoria tablet into the tank. The male continued to care for the nest until the eggs hatched, on schedule, whereupon he was busier than ever picking up the babies. He did not rest and refused to eat the few tubifex worms I

Please mention T.F.H. when writing to advertisers

★ a coral reef

to enhance your living room
Stands and equipment, decor-
matched to your home.

- Mediterranean
- African Woodcarving
- Driftwood Modern

With Exotic Fish, Invertebrates,
Flora collected from the world's
oceans.

Send 25c for
complete brochure.



by
XOTIQUE and MARINE IMPORTS
P. O. Box 1314
Plainfield, N. J.



There is nothing more natural than Nature itself . . .
**THE MILFORD AQUARIUM BACKGROUND
UTILIZES NATURE'S OWN MATERIALS**

AVAILABLE FOR ANY SIZE TANK

The above picture cannot possibly show the full beauty of the Milford Aquarium Background. Once it is placed inside the aquarium and the lights are turned on the background becomes an impressive wall of red and green shales, a mixture of both subtle and bold natural colors and ridges. It is so elegant so attractive that the tank looks beautiful even before fish, plants, and ornaments are added. And the background is specially made to be trouble-free. The shale will not react with the aquarium water and is bonded together firmly with nonreactive plastic so that it will not come apart. Solid support is achieved on top with two simple-but-strong clips, on bottom by the natural support of built-up gravel or sand. Special sponge-plastic strips keep fish from going behind background.

NOW 8 TIMES STRONGER!

By improving the bonding material, there is no breakage in shipment. Available at all of the best aquarium stores. Milford also makes caves, ledges, food guards, volcanoes and driftwood from the same strikingly beautiful colorful material.



MILFORD SPECIALTIES CO.
55 ESSEX STREET HACKENSACK, N. J. 07601

Tropical Fish Hobbyist

dropped into the tank. He had behaved like a perfect father, until a careful study of the nest on the following day disclosed no fry. I became suspicious and removed the male. It has now been four days since the bettas spawned, three since the eggs hatched, and all that my husband and I have been able to see is only one baby betta. What went wrong?

Michele McCabe
Bronx, New York

A. My own males are perfectly willing to eat while attending a spawn, although I generally do not feed them. I have never observed a male to eat his fry, even though many will eat their eggs. That certainly does not rule out the possibility, however. Another chance is that the fry died of disease. Ich or velvet infection of extremely young fry is more common than is generally known. I know of no effective cure for fish this young.

Dangerous Food

Q. A friend and I have been raising nice bettas and selling them for quite some time. Recently though, an unusual disease has appeared in quite a few males which are in jars. One or both gill covers begin to turn outward, while the gill membranes swell and turn almost black. Our males are fed live and

frozen brine shrimp, live tubifex, and beef heart. My friend and I suspect it is a bacterial disease from the tubifex, because we buy it at the same store, and although our fishes have never been together, we both have the same odd disease. We have tried tetracycline, salt, formalin dip, malachite green, and copper without any improvement. Also, several females have gotten a swelling of the forehead which becomes so grotesque that I've had to destroy them. Have you any suggestions?

Mrs. Donald Vargo
Chicago, Illinois

A. It is very difficult to diagnose diseases from descriptions even when they are as carefully written as yours. My first reaction is to suspect gill flukes, which should be controlled by formalin. Even though this did not stop the disease, it does not rule out flukes. One thing seems clear, and that is that the probable source of the difficulties is the tubifex. This is not to say that all tubifex are harmful. That depends entirely on where they are collected. In this case, they appear to be collected from locations where they can pick up some sort of parasite. The best I can suggest is to quit using tubifex and to destroy the diseased fish.



From your dealer or direct from T.F.H.

MOLLIES IN COLOR, by Dr. Herbert R. Axelrod, gives the hobbyist the most interesting glimpse yet at the fascinating and popular species of mollies. In addition to providing a complete history of the molly species, the book also goes into great detail about the habits of the fish and gives the reader all the necessary information to care for them properly. Many beautiful pictures in color and black and white make the book as attractive as it is authoritative. \$5.00.

COMPLETE environmental water control*



For years professional and amateur hobbyists have been adding and subtracting things from their aquarium water trying to provide an environment in which fish could thrive, reproduce and live comfortably.

Until the introduction of PICON, man has been unable to scientifically maintain the proper pH, chemical balance and environmental control of his water without the aid of a bewildering array of chemicals and gadgets, most of which seem to work against one another—if at all.

PISCES CHEMICAL CORP., after six years of research and experimentation, has developed a product which will almost totally eliminate the need of worry or concern over factors of water control which plague hobbyists.

PICON maintains water at a pH of about 6.5 at which most fish thrive. Their color improves markedly, fish are more active and, in many instances, fish difficult or impossible to breed, will now breed readily.

Water becomes crystal clear, waste-free, and with constantly, slightly acidic water, the incidence of bacterial and fungicidal infections drops markedly since these organisms cannot thrive well in an acidic medium.

1. PICON is non-toxic to fish and plant life.

2. Ammonia, one of the deadliest chemicals to fishes, is eliminated.

3. PICON, which is water insoluble, removes organic wastes from the water.

PICON is not a cure-all, it is not a miracle drug; it is applied scientific chemical control of your water with the absolute minimum of trouble and bother to the hobbyist (place it in your filter and forget it). PICON lasts three months, depending on initial water conditions and on the number of fish in the tank.

PICON comes in a nylon pillow for box filters or with a cartridge for use with under-the-gravel filters. One PICON pillow will properly maintain a 5 to 30 gallon aquarium.

P I C O N

PISCES CHEMICAL CORP., P.O. Box 435, Coral Gables, Florida 33134
U.S.A., Territories and Possessions Only

NAME _____
STREET _____
CITY STATE ZIP _____

* Satisfaction Guaranteed or Money Refunded if used according to directions.

ALL OTHER FILTERS UNDER GRAVEL FILTER

WHOLESALE INQUIRIES INVITED **\$2.98**

February, 1969

It Could Happen To You

BY NADENE NICOLE CURRY

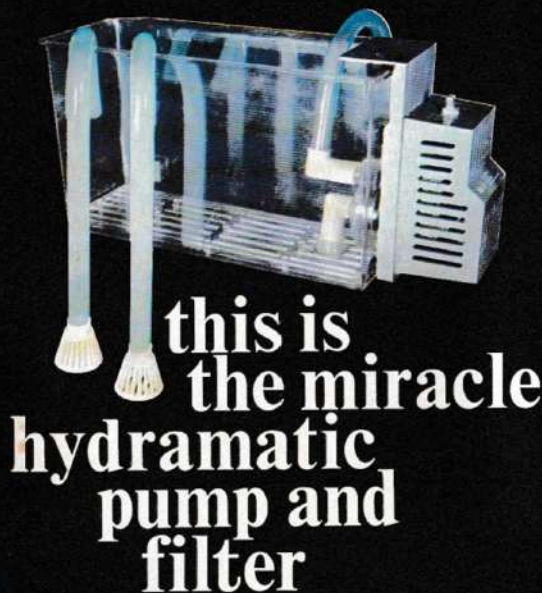
Gather around, embryonic lovers of fishes, and listen to my tale of truth. This is written especially for you who have just set-up your first tank. . . .

When my husband first lugged it home—that fatal day four years ago—I didn't want it! It was half-filled with unclear water and every once in a while one of its four inhabitants (a catfish, two guppies and a black mollie) would glide close to the glass for a curious peek at their new surroundings, then dart back to disappear into the misty-like water. Dispassionately I said:

"Give it back to the friend (?) from whence it came. I don't think it's been cleaned for months and anyway, who needs fish?"

Not that I had anything against fish, mind you; in fact, I had no feelings—either pro or con—about fish. Except that I hated to eat them. That evening at dinner—over spaghetti and french bread—we decided, after much rebuttal, to keep it. That was the aquarium that started it all! Not knowing a platy from a guppy, we loaded all the children (four of them) into the car on Saturday morning and went in search of the necessary equipment to launch our aquarium project (or whatever you call it.) Two angelfish, two platies, two swordtails and a catfish later, we returned home bearing (besides the fish mentioned) a heater, filter, pump, gravel, thermometer, dry fish food and some much-needed basic information. Talk about bare necessities! Now, after we had set-up our tank I thought to myself, all we have to do now is sit back and admire our fish. Ha! Little did I know what was in store for us. Words of wisdom that the aquarium shop owner had tossed us as we were leaving kept coming back to me. "Either you'll find you dislike raising fish and will quickly lose interest or you'll become hooked!" The man was serious! Did we have a laugh when we got in the car! Hooked?? On TROPICAL FISH!! That guy must have been talking to his fish too long. Who could ever become that attached to "things" called fish!

Well, over the months our library of tropical fish books grew and grew and we subscribed to *TFH*. We learned of many diseases which infect fish and how to cure them; learned all about live brine shrimp, daphnia and tubifex worms and our fish thrived on them. Our tank count now totaled five—the original five-gallon, a 15-gallon show tank, a 13-gallon custom "treasure chest," a 40-gallon and a 110-gallon custom tank (8 feet long). We reconciled ourselves to the fact that you DO NOT just sit back and watch your tropicals . . . you plan their diets, keep their aquariums clean and in running order, watch for signs of illness and doctor them accordingly, love them and take pride in them.



this is the miracle hydramatic pump and filter

It filters more than 200 gallons of water an hour, three times as much as any pump now on the market for the same price. It has a magnetic drive and the pump can be attached to any outside, inside, corner or undergravel filter. It is the most silent and versatile pump ever to be placed on the aquarium market. If you buy one and are not convinced it is everything we say it is, your money will be cheerfully refunded. NO OTHER PUMP MANUFACTURER EVER DARED TO MAKE SUCH A GUARANTEE!

Invented by the people with know-how.
MIRACLE PLASTICS CORP., Box 33, Jersey City, N. J. 07303

Manufactured under U.S. Design Patent No. 2,019, 347 and other patents pending.

Once our children had enjoyed guessing where our Sunday outings would take us . . . the beach? Zoo? Marineland? Disneyland? Now, as they piled into the car on Sundays, they merely asked, "Which aquarium shops are we going to today?"

Yes, folks, we—the disbelievers—were hooked!

At about this time, my husband and I visited a small cocktail lounge renowned for its collection of fishes. And there I saw IT!! Over two feet long, it glided gracefully back and forth in its 200-gallon tank, looking tremendously intelligent for a fish. Fascinated, I sat for hours watching the silvery beauty pace like a sentry from one end of the tank to the other—just below the surface—stopping only now and then to open its gigantic, landing-barge mouth and gulp a two-inch goldfish. That night changed my life (if I may be so dramatic) for I realized my goal in life was to have an arowana of my own.

I had discovered by then that I had a "wet thumb." It seemed that any fish that I introduced into our tanks thrived and grew and blossomed into healthy beauty.

My husband proved he didn't have a "wet thumb" by feeding *canned anchovies* (!) to our piranhas, who promptly lay down and died.

My birthday is in May and my husband began to sound me out about what I'd like. I pondered the question at length . . . I needed a new refrigerator, my watch was broken, the electric mixer wouldn't run and every time I went to buy clothes, the kids needed something, so that also was a



AQUARIUM FISH DISEASES

M-516

Dr. Rolf Geisler

Detection, prevention and cure of fish diseases made easy . . . with emphasis where it should be. Of use to every fish keeper, entirely practical in its approach.

\$1.

t.f.h. Publications
345 CORNELISON AVE., JERSEY CITY, N. J. 07302

20



EUREKA

WORLD'S FINEST

Aquarium

GRAVEL FILTER

YEARS WITHOUT CLEANING

- THE ONLY TUBULAR FILTER
- COMPLETELY SECTIONAL
- ADJUSTABLE & CONVERTIBLE
- NEEDS NO CHARCOAL OR WOOL
- MADE IN U.S.A.

The only TRUE GRAVEL FILTER
Eureka GRAVEL FILTER continuously circulates aerated water THROUGH THE GRAVEL, so there's no space below for decayed material or gases to collect. Installs without removing fish or gravel.

4 SIZES . . . Adjustable TO FIT ANY TANK

EUREKA PRODUCTS CO., 4 Bruen St., Newark, N. J. 07105

IF YOUR SOURCE IS UNABLE TO SUPPLY YOU, WRITE FOR INFORMATION

21

possibility. But in the back of my mind I knew the answer . . . the thing I wanted most of all was an arowana.

The night before my birthday, I came home from work and there he was . . . swimming in the empty 15-gallon tank that I had set up for discus. He was the tiniest arowana I'd ever seen, only two inches long and nearly transparent . . . and of course, absolutely beautiful! I immediately named him BWANA (for no special reason at all). The whole family fell in love with him, talked to him and he became part of our household. Gulping what seemed like tons of live brine shrimp, he grew more rapidly than I ever thought possible.

At about six inches, Bwana contracted ich somehow. He turned very dark and lay curled on the bottom for weeks, eating nothing. We knew we were going to lose him. Faithfully I stuck by him . . . sitting up nights to tempt him with brine shrimp, dosing him with tonic and ich remedies, siphoning out part of the water and replacing it with fresh. Then one morning I awoke to find my treasured arowana swimming friskily about, greedily gulping brine shrimp.

As time went by, we added many more tanks, fish books and tropicals to our already bulging home. One thing I've noticed to be true of all "hooked" aquarists . . . they're never satisfied. The tanks they add to their collection get larger (many homemade) and the fish more exotic and difficult to raise. It's a constant challenge.

Bwana, by then eating goldfish and measuring approximately 16 inches long, was extremely temperamental (as I've since found many arowanas to be). Any sudden movement or loud noise would send him thrashing wildly around the tank, followed by immediate retreat to the bottom. I'd have to hold goldfish between my fingers and lure him back to the top or he would lie for days on the bottom, refusing to eat or move.

Contrary to popular belief that fish can't recognize different people, Bwana allowed no one to clean his tank or even get close to it besides me. While I siphoned and worked in the tank, he would retreat to one corner and watch calmly, but my husband's several attempts were soon abandoned when our huge *pet* sailed out of the tank, over his head and onto the floor. I guess there's a scientific reason for his behavior, but I think he was just spoiled (if that's possible for a fish).

We kept a dim blue bulb burning in one end of Bwana's tank twenty-four hours a day. If, unthinkingly, we turned it out, the Arowana would begin his wild thrashing gyrations. One night the blue bulb murrur, "Gosh, he's ugly!" the morning we found our beloved arowana on the floor, dead. He had somehow—become frightened of the total darkness—jumped through a small opening in the back of the tank that I had neglected to cover tightly enough. We all cried (except my husband).

22

I vowed I'd never get another arowana. Large fish that become special pets are too hard to lose. It hurts. I stuck to that resolution for a solid week, then found myself in an aquarium shop, standing rapturously before a tiny, adorable arowana, saying, "I'll take it." That arowana had to be sold when it was nearly a foot and a half long, because we were moving and were unable to take it with us.

We now have Bwana the Third. He's much more enjoyable than our first two arowanas, because he's very tame and isn't the least bit temperamental or afraid. The only times he's jumped out of the tank is when we try to net him (we put him in the bathtub while we clean his tank). His insatiable appetite consumes nearly a dozen goldfish daily, but he can go over a week without eating, if necessary for some reason. Besides goldfish (feeder fish), the only things he'll eat are live brine shrimp (although it takes thousands to fill him up) and the new freeze-dried shrimp.

In the year that we've had Bwana III, he's grown from under two inches to over 18 inches long. His home is still the 15-gallon show tank in our living room that has housed all of our arowanas, but extending half the length of the tank now, he must soon be moved to a much larger one.

Everyone has his pet peeves, and the thorn in my paw is to read in a fish book that something can't be done . . . when I'm doing it. For instance, I've read so often that arowanas *must* be raised in a tank of at least 50 gallons. While this is most likely preferable, I've raised all three of my "Bwanas" to a length of a foot and a half in the 15-gallon show tank with few problems. My present one is still growing.

Maybe to beginning aquarists, raising fish seems like an awful lot of time, trouble and expense. Maybe so, but the pride you feel when you watch a tankful of babies that you've spawned yourself grow into mature beauty or that fish that was nearly dead recover completely due to your alertness and nursing, you feel an incomparable feeling of satisfaction and know it was well worth it.

Where will we go from here? We hope next to begin raising salt water fish. A tankful of these delicate, bizarre creatures is, I believe, one of the most beautiful sights on earth.

Of course, my first true love will always be the arowana (and if I sound very partial, it's because I am). The first place *everyone* stops when entering our house is in front of our arowana's tank, and I nearly burst with pride as I answer their many questions about him. The children bring all their school friends home to watch him eat; and once when I was in the kitchen, I heard one little seven-year-old murrur, "Gosh, he's ugly!"

My daughter promptly shushed her with, "Shhhh, my Mom will have a fit if she hears you."

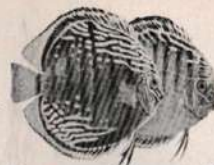
Novice aquarists, don't scoff or laugh at this story . . . *IT COULD HAPPEN TO YOU!*

23

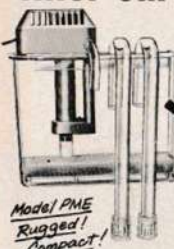
of interest here, and the visual presentation of photographs and drawings are as much a feast to the eye as the text is a feast to the mind. Over 150 glorious color photos taken by the author serve together with scores of black and white pictures and diagrams to profusely and tastefully illustrate this text. *Rivulins of the Old World* now establishes definite identifications for all species so that hobbyists need no longer guess about a fish and will always know exactly what species they are dealing with. A list of up-to-date nomenclature provides exact information for the hobbyist regarding the names of all known species. The author pinpoints the origins of the rivulin fishes as to region and even the names of the waters in which each can be found. The latest material on genetics of the rivulin fishes is included, with all data on everything from scalation to hemoglobin composition.



Guppies or Discus...



you can't give your collection finer care than with



Model PME
Rugged!
Compact!

Supreme Quality
ECONOMY-PRICED
AQUARIUM FILTER

Aerates, recirculates, filters, tanks up to 20 gallons! Not to be confused with other low-priced models on the market, this one is no toy. It is Supreme's time-tested, proven, rotary pump design, engineered down to a new, compact size, in a special high-impact plastic that can't rust or corrode. 100% American-Made... so quiet you have to look to see if it's running! Supplied complete with drain tubes and 1 piece, moulded, clear plastic see-through filter box that has no seams to open or leak over!

EUGENE G. DANNER MFG., INC.,
1660 Summerfield St., Brooklyn, N. Y. 11227

OTHER SUPREME PRODUCTS - Filter Pumps - 200 for Maximum Plants and Shells - Model 1700 Fish - Model 200000 - Accurate 100-100, 100-100 and 100-1000 Pump - Precision Cores and an Impeller, 200 and other sizes.

Supreme
AQUARIUM
PRODUCTS

New! Supreme HEETMASTER

The only Aquarium Heater with the patented, replaceable Sealed Unit, and Safety Cap that prevents tank-emptying or accidental change of thermostat setting! More exclusive new features, more improvements over conventional aquarium heaters than we can list in this space! Numbered thermostat control for accurate setting, protection by clear plastic see-through cover. Radio-mote eliminator and pilot light enclosed in inner capsule that's sealed against condensation, rust and corrosion. Capsule insulates sensitive thermostat from heater element, assures more accurate temperature control. Pilot light visible from any direction. Heater element wound on outside of core for faster, more efficient heating. All parts replaceable — no rivets in construction.



Guarantee
Supreme products are guaranteed for 1 year from date of purchase.



Female *Corydoras schultzei* takes off to stick the eggs to their hatching site.



Female (left) and male *Corydoras schultzei*.

Corydoras schultzei

BY R. ZUKAL

Photos by the author

I was not too enthusiastic when my friend told me that he had to take a few months' leave of absence and asked me to look after his six armored catfish. I had never before busied myself with such fish as my love was given to other species. I set up the fish I was entrusted with in a 15-gallon tank filled with fresh normal tap water. The temperature amounted to about 68°F. In order to decorate their "apartment" I put in a few Cryptocorynes. It was only after I had watched the lively fish feeding on the bottom soil that I decided to find out more about them. I took resource to my library and

read the following: "This small fish, which reaches a scant two and half inches, pertains to the group of the Callichthyidae—armored catfishes, and dwells in smaller waters in the tributaries of the Amazon. *Corydoras schultzei* was imported into Europe only in 1938.

I am saving myself the effort of describing the coloration of this little fish, for it can easily be seen on the color plate. Sexing adult specimens can easily be accomplished, for the males are slenderer and smaller, with taller dorsal fins ending in pointed tips.

NEW
miracle
SPAWNING GRASS, protects babies



& decorates your aquarium.

THE NEW MIRACLE SPAWNING GRASS WAS DESIGNED AND MANUFACTURED TO PROTECT NEWBORN BABY LIVEBEARERS. IT ALSO SERVES TO PROTECT THE EGGS OF MOST EGGLAYERS WHICH SCATTER THEIR EGGS, SUCH AS ZEBRAS, TETRAS, BARBS, AND WHITE CLOUDS. GOURAMIS AND BETTAS BUILD THEIR BUBBLENEST AROUND THE PLANT . . . AND WHEN YOU DON'T NEED THE PLANT FOR SPAWNING, IT MAKES A BEAUTIFUL BUSHY GIANT MYRIOPHYLLUM (DR. HERBERT R. AXELROD HAS A 150 GALLON AQUARIUM IN HIS OFFICE . . . IT IS DECORATED WITH 24 OF THESE PLANTS!) THE PLANT IS MADE OF NON-

TOXIC SPECIAL PLASTIC WHICH FLOATS. ON EACH END IS A LEAD WEIGHT, BY REMOVING ONE LEAD WEIGHT, THE PLANT STANDS LIKE A NORMAL PLANT, BY UTILIZING BOTH IT FLOATS, BY UTILIZING BOTH LEAD WEIGHTS, THE PLANT STAYS ON THE BOTTOM FOR BOTTOM SPAWNING SPECIES. AVAILABLE IN PETSHOPS ONLY. MADE BY THE PEOPLE WITH KNOW-HOW.



MIRACLE PLASTICS CORP. BOX 9128, LONG BEACH, CALIF. 90810
MIRACLE PLASTICS (N.J.) CORP. BOX 33, JERSEY CITY, N. J. 07303
BADER INDUSTRIES, INC. CHANGE BRIDGE ROAD, PINE BROOK, N. J. 07058



This lateral view of a pair of the author's spawning catfish clearly shows that the adult male (at right) is smaller and more slender than the female.


When I was sitting in front of the tank, watching their intelligent eyes that turned in all directions, they immediately captured my wholehearted interest. They were tireless in sweeping the bottom with their barbels in search of food. I supplied the fish with live Daphnia and Tubifex worms. Three days were sufficient for them to get acclimated in their new surroundings, and early the next morning the great event that is unforgettable for any aquarist took place: the fish spawned.

Size and contour differences between the male and female adult *C. schultzei* are accentuated in this photograph, taken while the female (with eggs carefully held in ventral pocket) was about to deposit eggs on the side of the spawning tank.



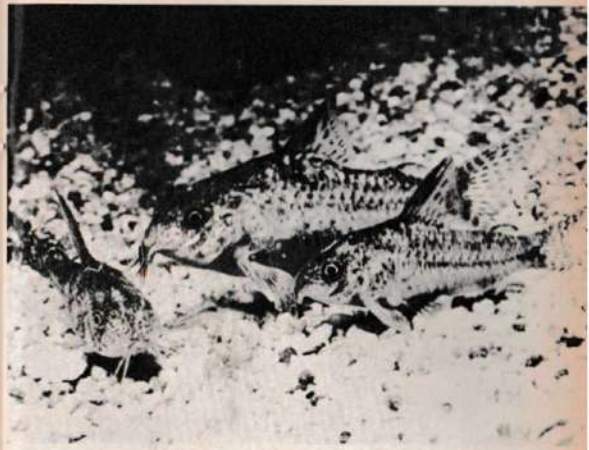
It's here!

SPLIT, the newest flake food for tropical fishes, is available in five sizes (50 ml, 100 ml, 250 ml, 1000 ml and 4000 ml). Each is packed in a full color decorated heavy metal container. In every 1000 grams of SPLIT you will find 46% protein and 4% fat. Its vitamin content is outstanding with .03 mg of Vitamin A; 350 mg of Vitamin B complex; 500 mg of Vitamin C; 60,000 IE of Vitamin D as Provitamin; and 1.2 mg of Vitamin E. All additives to SPLIT are natural and there are no artificial supplements added.

Ask for it at your petshop. 

MIRACLE PLASTICS (N.J.) CORP. BOX 33, JERSEY CITY, N. J. 07303
MIRACLE PLASTICS CORP. BOX 9128, LONG BEACH, CALIF. 90810
BADER INDUSTRIES, INC. CHANGE BRIDGE ROAD, PINE BROOK, N. J. 07058

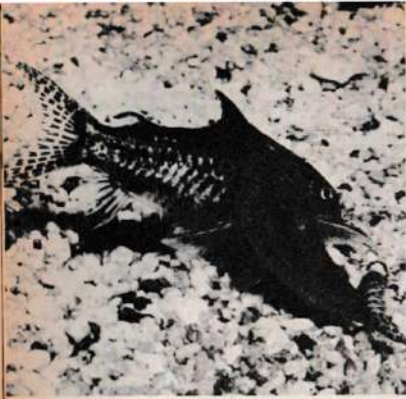
February, 1969



Spawning maneuvers of *C. schultzei* are almost a communal affair, with spawning males showing no animosity towards each other while pursuing a single female. It is generally best to have more than one male to each spawning female with this species and with other *Corydoras* species.

When I approached the tank with my camera, some eggs had already been placed on the plants and the glass pane. The complete act of spawning generally takes a couple of hours and usually takes place in the early morning hours. It follows an exact pattern. The written experience of many breeders advises placing 2-3 males with each female, for one male alone is not supposed to be able to fertilize all those eggs (about 200, depending on the size of the female). I had 4 males and 2 females in my tank.

And now to what I have been able to observe: The male whirls around the female, caressingly tickling her body from the caudal fin up towards the head. These caresses stop when the male reaches the female's head, and then he places himself crosswise in front of his mate's mouth. In this



Working from the tail to the head of the female, the male stimulates the female by lightly caressing the side of her body with his mouth.

moment the pair take on a position in which the female seems to have sucked fast to the ventrals of the male, directly in front of his genital opening. This lasts a few seconds. The male bends into the shape of an "S" and releases his sperm. This semen reaches the ventral fins of the female. The "sucking fast" of the female on the male also happens in open waters, not only on the



Holding fast to the male's body with her mouth while his body is bent into a reversed S-shaped curve, the female receives the sperm.


much
✓

Sometimes you get more than you pay for.

Take a Miracle Robin Heater. It has all the parts that the most expensive heaters in the world have. It is fully covered by a guarantee by one of the largest companies in the pet industry. It has a Pyrex heat-resistant tube. It has a full ceramic nichrome heating unit. It has a calibrated adjustable head. It is fully automatic and has a built-in thermostat.

forget about it. What do you get for nothing? Peace of mind that you have purchased the best heater made for the least amount of money. Miracle sells it cheaper because we produce almost 450,000 parts for all of our heaters . . . that's mass production! Buy the best and pay the least with a Miracle Robin. Available at pet shops only. (Also available in 220 volt for export.)



... more than a 

MIRACLE PLASTICS (N. J.) CORP., Box 33, Jersey City, N. J. 07303
Export Inquiries: MIRACLE PLASTICS EUROPA N.V., Waalhaven Z.z.40, Rotterdam, Holland

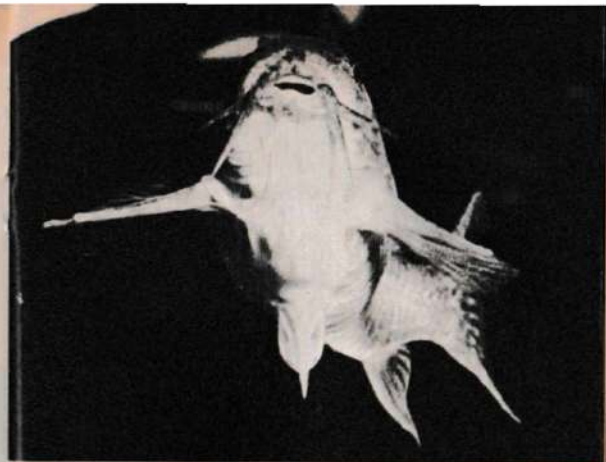
Tropical Fish Hobbyist

bottom, and it is at such occasions that one can admire the swimming skill and agility of the fish. After this act the male seems spent and rests for a few seconds. Sometimes the eggs are released into the pouch formed by the ventrals during



The process of receiving sperm from the male is accomplished in mid-water as well as at the bottom of the tank. Transference of sperm is more efficiently effected at the bottom, however, because at lower levels of the tank there is less chance for the dispersal of released sperm.

the mating act ("sucking fast") while at other times I was able to see that the eggs were laid into the pouch only a few seconds after the female had released the male again. Each single mating produces 1 to 5 eggs. It is my personal supposition that the inner faces of the female's ventrals are lined with a special substance, and that the male's sperm has already reached the



Pectoral fins spread and eggs clamped firmly between ventrals, this female shows that even the heavy-bodied Corydoras catfish species possess a grace of movement.





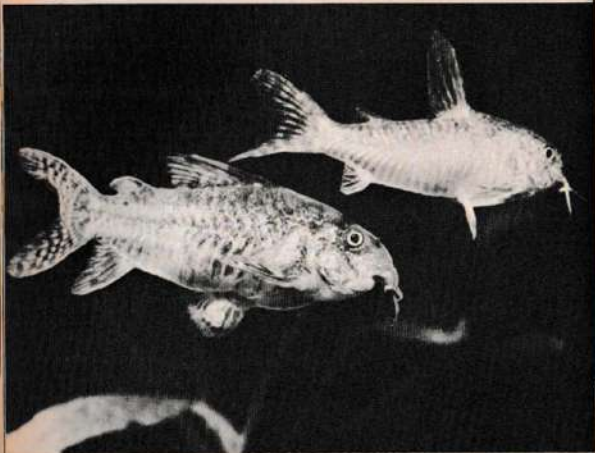
Males continue active pursuit of the females even after the sperm and eggs have been released and the female is cleaning the glass prior to attaching the spawn.

pouch before the eggs are admitted into it. Having the eggs in her pouch, the female seeks an adequate spot where to deposit them. While this happens the male partners frolic around her. Shortly before depositing the eggs, the spawning site is cleaned with the mouth, and, as can be seen in the picture, the fin pouch is opened a little, the strongly sticky eggs being released, or better said, "wiped off."



Released eggs immediately adhere to the site of deposit, usually the glass sides of the spawning tank or a fairly sturdy plant leaf.

Tropical Fish Hobbyist



The comparatively large whitish eggs can here be clearly seen clasped between the female's translucent ventral fins.

this, I am reasonably sure that during the act of spawning, the inner faces of the ventral fins are only slightly adhesive, but sufficiently, so as to retain the male's semen.

If the fish are properly fed, they will spawn every second or third day of the spawning period, which generally lasts from February to April. Despite the fact that these fish cannot be called spawn devourers, the parents should be removed after the eggs have been laid. Or else you may carefully "slice off" the eggs from the pane with a razor blade, transferring them to a nursery tank. Do not try to scrape the eggs off the plants where they have been placed; remove the whole plant instead. At the beginning, the eggs are white, then they turn gray, and finally, the fry hatch after 4-5 days, having to be supplied with food on the eighth day. Since they will eat even relatively coarse food, rearing the young is not difficult. Filtration, aeration and frequent changes of water are important factors towards success.

freeze-dried

FAIRY SHRIMP

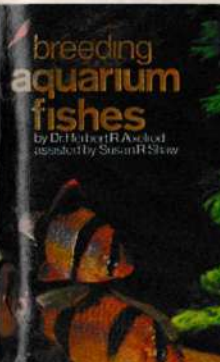
Miracle

15 grams... 69¢



New Item from Miracle, of course.

MIRACLE PET PRODUCTS, INC., Jersey City, N. J. and Long Beach, Calif.



How often have you read an account of how to breed a species of fish and found the account lacking several important details?

A vital requirement for breeding fishes successfully is having the right information . . . all of it. **BREEDING AQUARIUM FISHES** is the first book of its size and completeness to deal exclusively with the breeding phase of the hobby.

If you want to breed your fishes, buy the single major book devoted solely to helping you do so. You won't find yourself looking for any missing clues . . . There won't even be a mystery!

t.f.h.
Publications

\$9.95

BREEDING AQUARIUM FISHES contains almost 500 pages, complete with detailed and spawning photos.



Florida's Most Modern and fully stocked Hatchery presents a Partial List of our 300 Varieties.



TROPICAL FISH

Monthly Specials
(Wholesale Only)

Cardinals
Black Lyretail Mollies
Discus (all sizes)
Red Phantom
Black Phantom
Black Ghost (Albifrons)
Bleeding Heart Tetra
Knife Fish
Leaf Fish
Golden Lyretail Panchax
Albino Mollies
Albino Lyretail Mollies
Golden Severum
Black Veil Angels
Neons

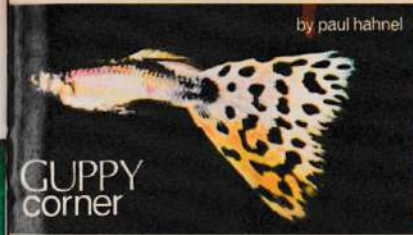
Lyretail Swordtails
Hi Fin Lyretail Swordtails
Albino (Catfish)
Chocolate Lyretail Panchax
Emperor Tetras
Libby Show Bettas
Tilapia
Pimeleodella
Corydora (all Species)
Albino Pearl Moon
Leporinus Faciatus
Romerzi
Rummy Nose Tetra
Gold Jet Red Tail Black Guppy
Honey Chana Gourami

King Cobra Guppies
Black Tuxedo Guppies
Albino Guppies
Green Delta Guppies
Half Beaks
Festivums
Nobian Variatus
Penguins
Red Tail Sharks
Red Fin Sharks
Black Neons
Half Black Guppies
Green Neos (new)
Hi Fin Platies
Exodon Paradoxus



Bill Riese's
Aquatic Fisheries

Please Use Your Letterhead in Writing for New Price List.
P.O. Box M, Vero Beach, Florida 32960 Phone: (305) 567-5277
Cable: "Aquatfish"



by paul hahnel

GUPPY corner

Too Few Young

Q. 1. Can you tell me why my females give birth to only four to six young at each birth? This is not an isolated incidence; all ten of my females have the same problem. They are in a 5-gallon tank.

2. What causes a male black molly to chase a female guppy? Also, will female mollies eat their young?

3. How would you go about performing surgery on a female guppy? Specifically, how would you operate on a heavy pregnant female to remove living young from her if she dies while giving birth?

Marvin R. Bittner,
Jacksonville, Texas

A. 1. It seems to me that if your females are indeed having only a few young as you mentioned, and

DELTA TAIL GUPPIES

Quality fish from trophy-winning stock. Healthy guppies with excellent color from large bodied delta tail strains.

Guaranteed to breed true

Green Cobra Deltas, \$15 pair \$30 trio

Blue or Green Deltas, \$10 pair \$14 trio

FISH SHIPPED ARE 3 TO 4 MONTHS OLD

GUARANTEED LIVE DELIVERY

POSTPAID AIR MAIL SPECIAL DELIVERY

Send check or money order to:

GLEN L. PARRISH

10032 McLENNAN AVENUE

GRANADA HILLS, CALIF. 91343

Phone 363-5563

that the babies are not simply being eaten up before you see them, that the water conditions in your tank are causing the trouble. Perhaps your tank is too crowded; bad conditions almost always lower a fish's ability to produce healthy young.

FIRST PRIZE WINNER AT THE INTERNATIONAL 1960 GUPPY SHOW,
BERLIN, GERMANY

THE BRONZE DELIGHT

After more than 30 years of breeding exhibition guppies, Mr. Hartung now introduces his greatest achievement — the Bronze Delight with its large Vail-tail breeds true. They are a fine hybrid of golden and grey guppies. You may choose from Green, Leopard, Blue, Variegated or Blue-green tails. \$14 per pair. \$55.00 extra for Trio.

HARTUNG GUPPY SPECIALIST

Other prize-winning varieties are: your choice of Red, Blue, Black, Dark Blue, Variegated — only \$6.50 a pair. Albino Vails, \$8 a pair. Beautiful Green Body and Vails \$9 a pair. GUARANTEED Live Delivery — Postpaid. Send check or money order to: Wm. Hartung, 91-34 - 88th St., Woodhaven 21, N. Y. — Y1 7-2338

Tropical Fish Hobbyist

2. Male livebearers are quite indiscriminating in their choice of females; they often chase females of different species. Also, of course, they may just be engaging in bullying tactics. Yes, female mollies will eat their young, but they are much less likely to do so than the females of most other livebearing species.

3. Sorry, but I've had no experience in cutting a guppy open.

Top Sword

Q. I am 15 and have been raising fish for six years and fancy guppies for four years. In October of 1965 I bought a trio of Hahnel red veil tail guppies. They were very prolific and produced 30 to 50 young at 26 to 28-day intervals. Recently I moved and lost all but 13 fish of mixed ages. Among those I have left I noticed a male with a red-top sword, although I never mixed the strain.

1. Is he a mutation?

2. How can I raise larger guppies? I raise the ones I have now in long 20-gallon tanks.

3. Are there any aquarium societies in my area?

Bob Earls,
Ashland, Pennsylvania

Please mention T.F.H. when writing to advertisers

THE EMERALD COBRA

(Snakebite Guppy)

The Ultimate in a Green Cobra Delta. Males have green snakebite pattern on body with wide tails; large, specific females are light colored with green cast. Guaranteed to breed true. \$12.50 per pair (\$4.50 extra for trio). Also available in blue.

Other varieties include Turquoise Green, Mountain solid green in body and Delta tails. Blue and Red Deltas, Orange Tail Albino. \$7.50 per pair (\$2.50 extra for trio). Guaranteed Live Delivery, Postpaid, Special Flash, Airmail Service.

Send check or money order to:

DELTA AQUARIUM STOCK COMPANY

Air Force Unit P. O. Box 95079

Los Angeles, Calif. 90045

Phone: (213) 545-6823

A. 1. It is quite common to get an occasional top-sword, bottom-sword, or double-sword.

2. Unfortunately, the answer to the often-asked question about how to raise bigger and better guppies cannot be provided in a few sentences. I provide my fish with clean conditions, proper temperatures, proper water chemistry, and a wholesome variety of foods, topping it all off with plenty of time and patience.

3. Write to the following societies; they might know of a club in your neighborhood.

Harrisburg Aquarium Society
State Museum Building
Harrisburg, Pennsylvania
Schuylkill Valley Aquarium Society
c/o Mr. Donald Poliwoda
146 Avondale Road
Norristown, Pennsylvania

TRUE-BREEDING GUPPIES

by RON and TINA AHLERS



From International Prize-Winning Strains
SELECTED TRUE BREEDERS

Blue-Greens. Subtle Variations of Both Colors in a fish that carries a spectacular high delta tail at maturity.
1 pair 2 pair 1 trio 2 trios
\$10.00 \$18.00 \$14.00 \$25.00
Red Tail Half Blacks. A solidly established strain, noted for its large size, and bright red delta tail.
1 pair 2 pair 1 trio 2 trios
\$12.50 \$22.00 \$18.00 \$32.00
No-odor micro-worm culture—add \$1.00 to fish order. Prices include Air-Mail Special Delivery.

Send check or money order to:
MID-ISLE AQUARIUM
P. O. Box 206-F1, Deer Park, N. Y. 11729
Live Delivery Guaranteed

UNCOMMON CURE FOR A COMMON DISEASE



CAUTION: Keep out of the reach of children. See back panel for additional instructions.

Miracle

Dr. Axelrod's Formula

ich / white spot cure

CONTENTS: 12 tablets - net weight 0.35 oz.

12 TABLETS • 98¢

at pet shops only

Dr. Axelrod's Formula ICH/WHITE SPOT CURE

is not a cure-all. It's a specific cure for a specific disease, specifically formulated to remedy ich/white spot. That's one reason why it's the best. When your fishes come down with ich, consult your specialist . . . Dr. Axelrod's Formula ICH/WHITE SPOT CURE. Handy, economical, easy-to-use tablets make it easy to cure ich.

P.S. Each "matchbook" tablet package has a different fish photo in back of which is a full description of the fish and a story about it. This series is included in our REMEDY AND TONIC, ICH/WHITE SPOT CURE, and STOPS ALGAE. When you have collected the entire series of 48 photographs, send them with \$3 and you will get an autographed copy of Dr. Axelrod's ENCYCLOPEDIA OF TROPICAL FISHES.

Send to MIRACLE PET PRODUCTS, INC., Box 33, Jersey City, N. J. 07303



salts FROM THE seven seas

BY ALFRED A. SCHULTZ

Q. My dealer has suggested that I put some copper pennies into my tank to perk up my fish. I have tried this and it seemed to work. Now, how long should I keep the pennies in the tank and how do I know if the tank has too much copper in it?

A. Three pennies can be kept in a

20-gallon tank indefinitely. However, if you want to be absolutely sure, you should test the water with a good copper test kit.

Q. How dangerous are the lionfishes to keep in a home aquarium?

A. The lionfishes are considered very dangerous, but only if touched. Their sharp spines contain a venom

Herbert Hoffman
Omaha, Nebraska

Mrs. Jean Rurade
Dewitt, New York



WHY RILA MARINE MIX?

Simply because you'll be getting the finest synthetic sea salt available — proven by years of consistent, dependable performance.

A quality product guaranteeing the highest degree of uniformity and purity.

Contains the 19 major trace elements of natural sea water. Provides the ideal media for all marine life.

Ask your dealer today or write for complete Product Information Bulletin and Free Salt Water Bulletin.

RILA PRODUCTS • Box 114, Teaneck, N. J. 07666

60



Lionfish, *Pterois radiata*

which can cause considerable pain. If you are stung often enough it can even cause death. Keep lionfishes in a completely covered aquarium and away from children's hands. Fishes of the family Scorpaenidae vary in the amount of danger they present; some are less dangerous than others, but all poisonous species should be handled very carefully.

Please mention T.F.H. when writing to advertisers

MARINE WORLD

ATLANTIC • PACIFIC
RED SEA IMPORTS

Finest selection of Marine Fish, Invertebrates, Corals, Salts, and related accessories, continually in stock! All fish tank acclimated and eating when sold.

WHOLESALE • RETAIL

3452 W. Devon, Ave., Lincolnwood, Ill.
Weekdays 12:30 P.M. Sat., Sun., 12:30 P.M.
Phone: 312-617-1175 or 312-774-7823

Please mention T.F.H. when writing to advertisers

THE U.S. GOVERNMENT USES "NEPTUNE SALTS" TO KEEP MARINE FISH ALIVE FOR YEARS AND YEARS!



Since 1953, world's #1 product for marine fish and sea horses. Tested, approved and used by experts of 18 public aquariums, over 100 universities, U. S. government agencies, industrial researchers, and hobbyists throughout the world. Just mix with tap water. It's so simple that Crystal-clear water lasts 4 to 7 years and longer by actual experience. "NEPTUNE SALTS" costs far less per year than any other product ever developed since you buy it only once. . . do NOT have to change water every few weeks. Write for salt water catalogue, jobbers and dealers, no charge. . . hobbyists, 25¢.

WESTCHESTER AQUARIUM SUPPLY CO. INC.

104 Manarock Ave., White Plains, N. Y.
Tel. 914 WH 8 0011

61



French angel fish,
Pomaconthus paru

Q. I have two french angel fish in my tank. One of them is about two inches in size and the other is about

four inches. The larger fish is constantly chasing the smaller fish. Is there some way I can stop this?

A. French angel fish should be kept by themselves, one fish to a tank. The larger fish will always chase and harass a smaller fish.

UNDERWATER BOOKS by Jerry Greenberg

Specialized underwater photography, 4x6 or 5x7 size. Includes a complete kit with FREE instruction manual. A complete kit with FREE instruction manual. A complete kit with FREE instruction manual.

SEAHAWK BOOKS

1000 E. W. 31 South, Miami Beach, Florida

3 PET SEAHORSES \$2.00 & FREE HITCHING POST

Order selected fresh caught live Seahorses sent Air mail from FFL. Orders receive a kit with FREE feed, hitching post, and simple instructions for raising these exotic little pets in jar or fish bowl. The father gives birth to the young (colts) alive. All the family will enjoy hours of fun with this relaxing and educational hobby. Guaranteed live delivery. U. S. A.

TWO SEAHORSES & ONE FREE only \$2.00. THREE PAIR SPECIAL — \$3.00 — Order TWO PAIR and receive ONE PAIR FREE. (See address.) No C.O.D. F. F. MARINE LIFE Since 1960 P.O. BOX 248-TF-69 DANIA, FLA. 33004

we guarantee you can keep this fish alive in our salts!



Chaetodon larvatus. Photo by Marcuse.

Marine fishes are expensive, and while they are not as delicate as many freshwater species, they require special water . . . water which contains the same trace elements and basic salts as the ocean.

Dr. Axelrod's Formula is the most widely used formula in the world. More public aquariums in Europe have used this mixture than use all other formulae . . . or natural sea water. Not only do we guarantee that it is the best on the market for fishes, but we guarantee that it is the best salt for marine invertebrates, too. This salt is used exclusively by the famous Exotarium in Frankfurt, Germany where millions of dollars worth of marine

exhibits depend upon our formulation to keep delicate species alive.

Dr. Axelrod's formula has been under test for more than 10 years by some of the world's most advanced public aquaria. None have found the salt formulation lacking in any characteristic. This is the first time this salt has been available in Canada or the U.S.A. It contains more trace elements than any other artificial sea salt.

enough salt to make 10 gallons of saltwater costs only \$3.98

Available at pet shops only.

MIRACLE PET PRODUCTS, INC., Box 33, Jersey City, N. J. 07302

62

canned BRINE SHRIMP

LEAVE IT TO MIRACLE FOR MIRACLES. WE WERE THE FIRST TO FREEZE-DRY BRINE SHRIMP . . . AND WE ARE THE FIRST TO CAN IT. NO MORE PROBLEMS WITH LIVE OR FROZEN BRINE SHRIMP. THESE ARE CANNED AND COOKED AND THEY STAY FRESH UNTIL YOU OPEN THE CAN. IDEALLY SUITED FOR MARINE FISHES, THEY ARE ALSO EXCELLENT FOR GUPPIES, PLATIES, MOLLIES, SWORDTAILS, CICHLIDS AND LARGE TETRAS. AVAILABLE IN TWO SIZES, THE MIRACLE NORWEGIAN BRINE SHRIMP COMES IN A HERMETICALLY SEALED CAN WITH A SPOON AND REPLACEABLE COVER. MUST BE REFRIGERATED OR FROZEN AFTER OPENING.



Available at pet shops only. MIRACLE PLASTICS (N. J.) CORP., Box 33, Jersey City, N. J. 07303
T.F.H. Publications (London) Ltd., 13 Notley Lane, Reigate, England
Export Inquiries to MIRACLE PLASTICS EUROPA N.V., Waalhaven 2.40, Rotterdam, Holland

MAIL CALL

If you have an aquarium question that you would like answered, send it to MAIL CALL. Each month the most interesting questions received and their answers will be published in this column. Letters containing questions cannot be acknowledged or answered personally. Address all questions to MAIL CALL, T.F.H. Publications, Inc., 245 Cornelison Avenue, Jersey City, N. J. 07302.

Black Ghost

Q. I have two questions. They both deal with different species of fish.

1. In the Aquatic Fisheries advertisement one of the species of fish listed is the black ghost (Albifrons). Could you describe this fish, and tell its temperament? Is this the fish in the small photo in this ad? If not, what is this strange fish?

2. I bought a fish called an upside-down catfish. It is a mottled brown color and, as its name implies, it has the habit of swimming upside-down. It mustn't be so rare since in New York it is quite commonly seen and it isn't very expensive. What is its Latin name? Where does it come from?

Thanks for the help your magazine has given me and other hobbyists!

Richard Jones

Queens Village, New York

A. The black fish with the white marking near its tail is indeed called the black ghost; the fish's scientific name is *Sternarchus albifrons*. It comes from South America, and the "ghost" part of



Sternarchus albifrons

Teo Wuy Yong
& Sons, Ltd.

Importers & Exporters of
Fancy Tropical Fishes,
Wild Birds & Animals
Shipments to Any Part of the
World

28, Yio Chu Kang Road

Singapore 19

Circle Address:

"CATFISH" SINGAPORE

ELIMINATE THOSE HARD WATER PROBLEMS with . . . RILA WATERSOFT POWDER



- Softens water easily and economically with complete control . . . to any desired level.
- Removes only those chemicals responsible for hard water . . . does not remove other elements essential for fish and plant life.
- Economical way to make soft water to replace aquarium water lost through evaporation.

FOR ACCURATE, RELIABLE TESTING: RILA WATER HARDNESS TEST KIT

Ask your dealer today or write for complete Product Information.

RILA PRODUCTS

P. O. Box 114

Teaneck, N. J. 07666

Tropical Fish Hobbyist



GROW YOUR OWN FISHFOOD!

- It's cheaper in the long run. FAST RETURN—MAIL SERVICE. We get your order in the morning and ship it to you in the afternoon. Please see our fine fish tank and service! Directions always included.
1. BRINE SHRIMP (MIRACLE) 25.00. Send a thousand dollars to give you the natural, fastest, guaranteed brine shrimp from Denmark. One day before you ship. 100's of 10 days. Shrink into aquarium. They stick on top of water till eaten. Bottle carries you start and over one month. Our fine fish on most tropical fish and salt water. 100's of 100's. Excellent for most. 100's of 100's. Special strain grows in most cases.
 2. BRINE SHRIMP (MIRACLE) 25.00. New hobbyists substitute. Comes prepared in aquarium grade. Clean and to taste. Counts aquarium.
 3. BRINE SHRIMP (MIRACLE) 25.00. About the best natural food. Counts aquarium.
 4. BRINE SHRIMP (MIRACLE) 25.00. Counts in some forms. Perfect. Good for aquarium and live water. No fish. Best. Excellent for most. Counts aquarium.
 5. BRINE SHRIMP (MIRACLE) 25.00. 1. Polystyrene form of brine (plastic). Good for most. 1. Some form of brine (plastic). Good for most. 1. Some form of brine (plastic). Good for most. 1. Some form of brine (plastic). Good for most.
 6. BRINE SHRIMP (MIRACLE) 25.00. Many different kinds. Ready to reproduce in the aquarium. For many.
 7. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 8. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 9. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 10. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 11. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 12. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 13. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 14. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 15. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 16. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 17. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 18. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 19. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.
 20. BRINE SHRIMP (MIRACLE) 25.00. Excellent for most.

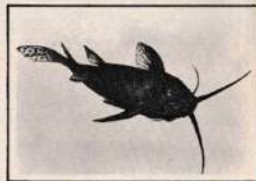
For the latest list of our items, send 30¢ for handling and shipping charges. If you send 10¢ for 30¢ for annual and 50¢ for special delivery to your door.

AQUA ENGINEERS

U.S.A. CANADA
Box 1, Chatham, Mich. 48842 Box 227, Sudbury, Ontario

its name derives from the belief of the natives in its homeland that when people die their spirits inhabit these fish. *Sternarchus albifrons* is a peaceful fish, even though it can grow to over a foot in length. See page 1-564.00 in Exotic Tropical Fishes for a comprehensive digest on its care.

2. From your description, your upside-down catfish is *Synodontis nigriventris*, from Africa. There are a number of



Synodontis nigriventris

other *Synodontis* species occasionally available, but none is as cheap as *S. nigriventris*. *Synodontis angelicus*, for example, called the polka dot upside-down catfish, is quite expensive and only rarely seen.

The Easy Way

Q. I am writing regarding your article in the November, 1968 *Tropical Fish Hobbyist* entitled "Heaven is Where the Angels Are . . . If . . ."

In the article, Mr. Nevins states that he has had his four angelfish for about two years and has not attempted to breed them. We have kept and raised angels for about four years and from our experience I would say that if Mr. Nevins' fish aren't spawned in two years that they are either not happy or he does not have a pair in the tank. We have found they do not have to be induced to spawn. If you feed them properly, keep them happy and a

male and a female in the tank it's inevitable. Usually by the time they are a year old they pair off and start spawning with no assistance from us whatsoever.

As we have always tried to let our fish live as natural a life as possible in a tank, we have always let the parents raise the fry, and with the dozen or so parents we have had we have not yet had one that ate their babies. They have all been excellent parents, and if Mr. Nevins ever has his fish spawn he is for a treat. It is an interesting and thrilling experience watching the parents care for and raise their young.

From the many articles I have read on spawning various fish, it seems that many people worry about creating special conditions to induce their fish to spawn. It has been our experience that if the fish are kept well fed at all times and their tank is kept clean and at about 80° that as soon as they are old enough they will pair off and spawn. We do not worry about PH or DH and feed them mainly live food. The babies are raised on live baby brine shrimp, which we hatch.

We have also spawned and raised Discus, our first love, and we have found that the same conditions hold true for them, except that they prefer a somewhat higher temperature, 82 to 84. Discus, however, are much more

susceptible to various ailments and are not as hardy a fish as the angels.

Mr. Leonard Bellman

North Hollywood, California

A. You've said it all when you say "Feed them properly . . . and keep them happy." But "keeping them happy" is just what a lot of hobbyists have trouble doing. They don't know how to keep their fishes "happy," or they do know but don't want to go to the expense or inconvenience involved. Fortunately for hobbyists, many of our favorite species will breed under just the conditions you've outlined. But other species need a little extra: maybe privacy, maybe special planting arrangements, maybe sunlight on the tank for a few hours a day, maybe salt in the water; it may be very little indeed, but it's something a little special nonetheless.

Egyptian Mouthbreeders

Q. About four months ago I purchased

PET TOWNE

QUALITY TROPICALS IN
5 LOCATIONS

Massachusetts:

- 776 State St. (Rt. 20) SPRINGFIELD
- 1655 Boston Rd. "Eastfield Mall" SPRINGFIELD

Connecticut:

- 671 Silas Deane Hwy. (Rt. 9) WETHERSFIELD
- 544 K Windsor Shopping Plaza — In the mall. (Rt. 5A) WINDSOR
- (Rt. 69) Waterbury Ave. PROSPECT

Come See Us — Soon and Often

THE DEGAULLE GUPPY

(Flag of France)

The most unusual breed of this era. A large, firm hybrid with light face, jet black body, flowing red tail, and white dorsal fin. Profuse females are olive color with black oval. They breed from \$12.50 per pair, (\$4.50 extra for 10).

Other varieties include Alpine Vails, Red Pacifics, Los Vegas Green, Lovender, \$7.50 per pair. (\$2.50 extra for 10.) Guaranteed Live Delivery, Postpaid, Airmail. Send check or money order to . . .

MANHATTAN AQUARIUM SERVICE

224-21st St., Manhattan Beach, Calif. 90266
Phone: 545-4421



Egyptian mouthbreeders

two Egyptian mouthbreeders. Can you tell me about what size they can be bred and how I can go about breeding them? They are now about two inches long.

Robert Neiman
Philadelphia, Pennsylvania

A. Egyptian mouthbreeders two inches long are old enough and big enough to spawn. Feed them well and don't crowd them and they'll spawn (providing, of course, that the two you have are a pair). You'll have better luck in getting them to

spawn if you give them a tank to themselves; it needs to be a big one.

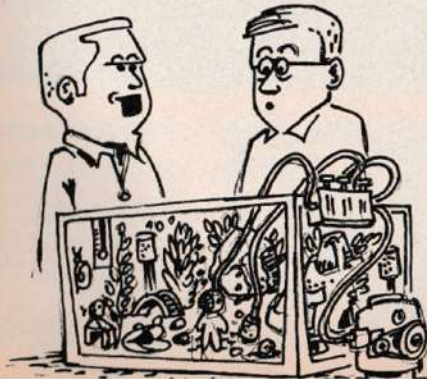
Snappy Oscar

Q. I recently purchased two pairs of zebra danios. I placed them in a 10-gallon tank with one oscar and some other fish. The oscar is about one and a half inches long. After I put the zebbras into the tank, the oscar started to chase them. Then the oscar started to bite the zebbras, and oscars have pretty strong jaws. So I put the oscar into a breeding trap so it wouldn't bite the zebbras any more. He looks terrible in the small trap.

I can't take him out because he will kill the little fish. I also have a pair of kissing gouramis in the tank. The oscar bites them too, but they are much bigger than he, so they don't get hurt. I don't want to sell the oscar. What do you suggest I do?

Todd Simon
Roslyn Hts., New York

"So I got to thinking ---with all that other stuff, who needs fish?"



A. We suggest you put the oscar into a separate tank big enough to house him comfortably. If your tank were larger, you could partition it and leave the gouramis and zebbras on one side of the partition and the oscar on the other, but a 10-gallon tank is too small to allow much room for either group once it's partitioned.

Golden Severums

Q. I have had a trio of golden severums for quite a long time, but I cannot find any information about their habits, water conditions, food requirements, etc. Could you please fill me in?

Bob Birkhauser
Madison, Wisconsin



Cichlasoma severum

A. Your golden severums will spawn in exactly the same manner as non-golden severums, Cichlasoma severum, and have the same general characteristics as regular C. severum, except that they have less resistance to temperature fluctuations. Check any good book or past issues of TFH for complete maintenance and spawning information.

Active Zebra

Q. I have a zebra danio that swims around madly in circles and very seldom rests. The temperature of my tank is about 81° and the pH is about 7.4. The other fish in my tank show no signs of being disturbed. My water isn't cloudy and my tank isn't overcrowded.

2. I have tried many times to keep anacharis with my tropicals, but it

this is no exaggeration:

FLAVOR FLAKES
is the world's best flake food...



bar none...

and it will not cloud the water

Flavor Flakes is a combination of five nutrition-packed flakes containing the highest percentage of proteins and vitamins ever looted into a single fish food.

This new form of food was developed in Western Europe by a famous marine biologist. Its ingredients are scientifically balanced to reduce mortality, increase growth, bring out the natural color of fish and provide better health. And Flavor Flakes tastes so good fish eat them like mad. Get some today and see.

More For Your Money 1 full oz. 69c
Money-Back Guarantee: If you're not completely satisfied return can with unused portion and your money will be refunded.

All Aqua Stock Products are Thoroughly Tested in our own Laboratories
AQUARIUM STOCK COMPANY, INC.
DEPT. B, 27 MURRAY ST., NEW YORK, N. Y. 10011
9070 BEVERLY BLVD., LOS ANGELES, CALIF.

keeps falling apart. Is this because of the lack of light, or is it because anacharis needs a lower temperature than 70-80°?

3. What types of floating plants are best in fresh-water aquaria? Why are floating plants harder to obtain than rooted plants?

Greg Braknis
Chagrin Falls, Ohio

A. 1. Zebras are very active; continuous back and forth swimming is normal to them. Unless the circles that your zebra swims in are so small that the fish appears almost to be chasing his tail, don't worry.

2. Probably a combination of both. It will be easier for you to increase the amount of lighting than to cool off the tank, so try experimenting by giving the tank more light. You can increase the wattage of your bulbs or keep the lights on longer.

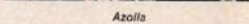
3. If by "floating" plants you mean plants that must be left floating at the top of the water and that cannot be rooted at the bottom, the three best types available are of the genera Riccia, Salvinia, and Azolla. Unfortunately, these plants are comparatively expensive and are not too



Riccia



Salvinia



Azolla

Please mention T.F.H. when writing to advertisers

Bulk Tropical Fish Food

You can now purchase direct from Canada's largest and oldest producer of guaranteed quality Premium Tropical Fish Food, 100%. Organics with no fillers, a product of the sea, composed of small fish, shrimp, crust. fish liver, eggs, vitamins natural food ideal for tropical or fish water fish and used by top breeders for years.

SPECIAL MAIL ORDER OFFER
3 ONE POUND BAGS TANGLO VARIETY PACK \$10.00 POST PAID AND DUTY FREE OR
2 ONE POUND BAGS GUFFY FOOD \$10.00 POST PAID DUTY FREE OR
ONE POUND GUFFY FOOD \$2.50 POST PAID DUTY FREE

Aquarium Stores and Merchants, special prices 20% off. Ship-shipped date. Height duty free. Send for descriptive price list.

Hart & Howes Ltd. 569-Stevenson Highway
Richmond, B. C., Canada Tel. (604) 277-4228

Now! Make Your Own Fresh Ocean Water with AQUA MARINE SEA SALTS for marine fish

Aqua Marine Artificial Sea Salts converts tap water into fresh ocean water and maintains an ideal salt water condition in your aquarium. Marine fish thrive on it. Used by collectors and hobbyists everywhere.

1 lb. package for 3 gallons 98c
5 lb. package for 15 gallons \$4.75

ORDER TODAY! Write for our new Catalog-60c
AQUARIUM STOCK COMPANY, Inc.
DEPT. B, 27 MURRAY ST., NEW YORK, N. Y. 10011
9070 BEVERLY BLVD., LOS ANGELES, CALIF.



use SNAIL-RID

- SNAIL-RID... Internationally accepted by universities, fish farms, and hobbyists all over the world on the POSITIVE method for snail control.
- SNAIL-RID... is quick and easy to use - one drop will kill BOTH the snail-eggs and adults within hours without harming the fish.
- SNAIL-RID... is inexpensive-1/2-oz. bottle will treat over 400 gals. of water at less than 1/16¢ per gallon.

Approved & Registered USDA
If unable to obtain from your local dealer, send \$1.00 to ARSIAN RESEARCH, 374 S. Mountain Westland, Michigan 48183

MASTER BREEDER CULTURES by DALECO

ENJOY CONTINUOUS LIVE FOOD SUPPLY CLEAN, DEPENDABLE, FOOL PROOF

Mail Coupon Today! DALECO, 414 Glenbury, Tonawanda, N. Y. 14150. I enclose \$ _____ Rush postpaid on Money-Back-Guarantee.

- Culture Method (specify) \$ 2.25
- BROSIOPHILA (Living Fruit Flies) 1.50
- MICRO MASTERS BREEDER 3.00
- CULTURE MEDIA 1.00
- MICRO MASTERS BREEDER 3.00
- (Culture, Breeder Jar and Media)
- BIRGIERIA (green infusoria) 1.50
- THERBICK (Meal Worms) 1.75
- GAMMARUS (1/2" crustacean) 1.75
- OLIGOCHEATES (EM) aquatic worms 2.00
- DAPHNIA MAGNA 2.00
- STERICLEAH (8 oz. concentrate) 1.00
- SR. WATER POLISHER FILTER (removes fungus on bottle eggs) 4.00
- WORLD'S FINEST AIR PUMP (removes air, release by compression) use for 1.30 aquariums--- 33.95

*Starter Cultures TOTAL \$10.00

Name _____ Address _____

keeps falling apart. Is this because of the lack of light, or is it because anacharis needs a lower temperature than 70-80°?

3. What types of floating plants are best in fresh-water aquaria? Why are floating plants harder to obtain than rooted plants?

Greg Braknis
Chagrin Falls, Ohio

A. 1. Zebras are very active; continuous back and forth swimming is normal to them. Unless the circles that your zebra swims in are so small that the fish appears almost to be chasing his tail, don't worry.

2. Probably a combination of both. It will be easier for you to increase the amount of lighting than to cool off the tank, so try experimenting by giving the tank more light. You can increase the wattage of your bulbs or keep the lights on longer.

3. If by "floating" plants you mean plants that must be left floating at the top of the water and that cannot be rooted at the bottom, the three best types available are of the genera *Riccia*, *Salvinia*, and *Azolla*. Unfortunately, these plants are comparatively expensive and are not too



Salvinia



Azolla

Please mention T.F.H. when writing to advertisers

Bulk Tropical Fish Food

The six new purchase direct from Germany's largest and oldest producer of guaranteed seawater frozen tropical fish foods. 100% Organic with no fillers, a product of the sea, compared with most fish, shrimp, snail, fish liver, eggs, etc., which contain food value for tropical or salt water fish and used by top breeders for years.

SPECIAL MAIL ORDER OFFER
3 ONE POUND BAGS FANOUS VARIETY PACK \$10.00 POST PAID AND DUTY FREE, OR
3 ONE POUND BAGS GUPPY FOOD \$10.00 POST PAID DUTY FREE, OR
ONE POUND GUPPY FOOD \$1.50 POST PAID DUTY FREE

American Shrimp and Mollusks, special price 20% less shipped duty free. Send for descriptive price list.
Holt & Mowes Ltd. 569 Stevenson Highway
Richmond, B. C., Canada Tel. (604) 277-4228

MASTER BREEDER CULTURES
by DALECO

ENJOY CONTINUOUS LIVE FOOD SUPPLY
CLEAN, DEPENDABLE, FOOL PROOF

- Mail Coupon Today! DALECO, 416 Glenholly, Tonawanda, N. Y. 14150. I enclose \$ _____ Rush postpaid on Money-Back-Guarantee.
- Culture Method (specify) \$ 2.25
 - DROSOPHILA (fruiting Fruit Flies) 1.50
 - DRISOPHILA MASTER BREEDER Culture plus 1 yr. AGAR supply 3.00
 - MICROWORKS 1.00
 - MIKRO MASTER BREEDER pkg. (Culture, breeder lot and Media) 3.00
 - EUGLENA (green infusoria) 1.25
 - TEREBROD (Small Worms) 1.25
 - GAMMARUS (in crustaceans) 1.75
 - OLIGOCHAETES (in aquatic worms) 2.00
 - DAPHNIA MAGNA 2.00
 - SPHERICUM (in or concentrate) 1.00
 - SR. WATER POLISHER FILTER prevents fungus on bottle eggs 4.00
 - WORLD'S FINEST AIR PUMP for aquariums who refuse to compromise. "Shower" air for 1-10 aquariums. Cultures 33.95

Name _____ Address _____



Riccia

often offered for sale, as you've discovered. They're harder to obtain because not too many aquarists want them, so not many shops stock them. Also, common bunch plants like anacharis and cabomba grow much more quickly and profusely under plant farm cultivation methods, so more plant growers grow them.

Crowded Angels

Q. I have one angelfish, three cardinal tetras, and one catfish. I am planning to get three more angelfish about the size of a quarter. The 10-gallon tank is equipped with an aerator-filter and heater-thermostat. All the water is boiled to remove chlorine. If the angels overcrowd the aquarium when they reach adult size, will the angels die, or will the cardinal tetras, if any will.

Bob Wagner

Richmond, Kansas

A. Under very crowded conditions, the bigger fishes will usually die off first, provided that the species involved have approximately the same oxygen requirements per unit of weight. But in a filtered and aerated aquarium containing only four angel fish, a catfish, and three cardinal tetras, there should be no problem, even though the angels will probably not reach their full potential size.

Turtles in Tanks

Q. Should turtles five inches long be put into aquariums?

Paul Kalous

Oshkosh, Wisconsin

Now! Make Your Own Fresh Ocean Water with AQUA MARINE SEA SALTS for marine fish

Aqua Marine Artificial Sea Salts converts tap water into fresh ocean water and maintains an ideal salt water condition in your aquarium. Marine fish thrive on it. Used by collectors and hobbyists everywhere.

- 1 lb. package for 3 gallons 98c
- 5 lb. package for 15 gallons \$4.75

ORDER TODAY! Write for our new Catalog—60c
AQUARIUM STOCK COMPANY, INC.
SUITE 2, 22 MURRAY ST. NEW YORK, N. Y.
800 BEVERLY BLVD. LOS ANGELES, CALIF.



use SNAIL-RID

- SNAIL-RID . . . is internationally accepted by universities, fish farms, and hobbyists all over the world as the POSITIVE method for snail control.
- SNAIL-RID . . . is quick and easy to use—one drop will kill BOTH the snail-eggs and adults within hours without harming the fish.
- SNAIL-RID . . . is inexpensive—15-oz. bottle will treat over 400 gals. of water or less than 1/4c per gallon. Approved & Registered USDA. If unable to obtain from your local dealer, send \$1.00 to ARSAN RESEARCH, 375 S. Houston Westland, Michigan 48185

A. Thanks for giving us your informative letter. To your question: yes, a 5-gallon tank would be big enough.

Honey Dwarf Gouramis

Q. Recently I purchased a pair of honey dwarf gouramis, *Goldia chana*. They are about an inch in length. I'm very interested in breeding them and would like to know whether they're big enough and whether you have any suggestions about breeding them. I've heard that they are hard to get to spawn. Is this true?

Eric Worsham
Tulsa, Oklahoma



Honey Dwarf Gouramis

A. No, they're not very hard to spawn, but at only an inch long they're probably too young. Give them the same conditions as you'd give the dwarf gourami.

"Dwarf" Rams

Q. Having looked through many books, I have been able to find only a small amount of information on the dwarf ramirezi species. I know of only two species of dwarf ramirezi: the golden ram and *Aptistogramma ramirezi*. Could



Aptistogramma ramirezi

you please tell me the Latin name for the golden ram and whether any other dwarf ramirezi exist?

Nancy De Bella
Los Altos, California

A. The golden ram is just a color variation of the regular ram, *Aptistogramma ramirezi*, and therefore has the same scientific name. I have never heard of a "dwarf" ram and guess that a dwarf ram is just a regular ramirezi, smaller than the big wild ramirezi sometimes sold as "giant" rams.

Please mention T.F.H. when writing to advertisers

DEALERS and JOBBERS

Get our free price list on our many varieties of tropical fish and aquatic plants.

Write To: **TOM'S AQUA FISHERIES**
P. O. Box 322, South River, N. J. 08882

★ MONTHLY SPECIALS ★
Cable: TOMAQUA • Phone: 201-257-1940

ORDERS GUARANTEED LIVE!



YOUR FISHES' HEALTH

"ich"

By **Roger Lee Herman**

O "Ich" and "white spot" are probably the most common diseases in both freshwater and saltwater aquarium fishes. They are easily identified even by a novice and therefore are certainly more frequently recognized than most other fish diseases.

These diseases are caused by ciliated protozoans, one-celled animals covered with tiny hairs, that burrow under the skin and feed on the cells and fluids of the fish. They grow so large that they can be seen without a magnifying lens. The largest size is about 1 millimeter (0.039 inch).

Ichthyophthirius multifiliis is the parasite responsible for the disease of freshwater fishes known as "ich." At one time it was thought that this protozoan parasite infested marine fishes also, but now the saltwater parasite is considered to be another species, *Cryptocaryon irritans*. The protozoans are very similar in appearance and seem to have a similar life cycle. There is,

however, some difference in recommended treatment, as will be indicated below.

Both parasite species are widespread and seem to be able to attack any species of fish held in aquaria. Their wide geographical range and their ability to infest any species make these parasites a constant threat to the aquarist. In addition, fish can carry these parasites with-

Please mention T.F.H. when writing to advertisers



and so do fish . . . Plantabbs Aquarium Plant Food Tablets feed your aquarium plants to thriving, full-bloomed beauty. Healthful to fish, too. Economical and convenient: just put in 1 tablet per each 3 gallons of water. Use once every 10 days. Guaranteed Safe!

PLANTABBS
AQUARIUM PLANT FOODS
Plantable, Timonium, Maryland

out showing signs of the disease, and this makes it possible to introduce the parasites into new aquaria without realizing it. This is a strong argument for quarantining new fish before adding them to the community tank.

Fish which have been kept, intentionally or not, at a temperature below 70 F may have parasites which are too small to see. The best temperature for the ich parasite to live, its optimum temperature, is between 70 and 75 F. Below this, the parasite's growth is very slow.

Also, and really more important, is the fact that fish that have survived an infection of ich are at least partially immune. This means that they can carry some of the parasites without any apparent harm to them-

selves. The parasites these fish carry may be few in number, or they may be so small that they are not noticed.

Only one *Ichthyophthirius* organism is needed to start an epidemic in a community tank. This is because of the protozoan's method of reproduction. When an ich parasite reaches its full size, it leaves the fish and settles to the bottom of the tank. Here it forms a protective shell around itself and begins to divide. A large adult may divide into as many as 2000 small cells. These cells, called "tomites," are the infective stage of the life cycle. The shell made by the adult form ruptures, and the tomites begin swimming about looking for a nice juicy fish. The tomites burrow beneath the skin, feed, grow, leave the fish, and divide again. This cycle is complete in three to four days at 70-75 F. In a few days hundreds of thousands of parasites may be present in the tank.

We can see from the above that an infected fish may show only a

**CLEAN AQUARIUMS
ONE HAND OPERATION
LARGER VALVES
LONG LIFE
GUARANTEED**

**"ONE HAND"
OPERATION**



"Jibby"

IS THE ANSWER
MILLIONS OF FISH
AROUND THE WORLD
ARE HEALTHY BECAUSE OF

"Jibby" CLEAN AQUARIUMS

SAID BY FINE DEALERS AND
DISTRIBUTORS EVERYWHERE
FREE CATALOG

FRAMAR MFG. CO.
3958 ARLA ROAD LOS ANGELES CALIF. 90064

**Bulletin
Editors**

For a free monthly newsletter report of the products that are new in the pet field, write Barbara Treleven — PET SHOP MANAGEMENT MAGAZINE P. O. Box 109, Fond du Lac, WI 54935 Established 1946 One FREE sample copy of PSM Magazine to editors only.

few spots, perhaps only one, but if the fish is left untreated the number and size of the spots will increase until the fish is nearly covered and dies. Fortunately, it is rather easy to cure this disease. A number of drugs have been used and are recommended by different authorities. Quinine, methylene blue, malachite green, and combinations of these are available in pet stores. Formalin has been used both in freshwater and saltwater aquaria. In saltwater aquaria, copper sulfate is also recommended.

For freshwater fishes, I have a personal preference for malachite green, but this compound is very toxic to fish and should not be used with tetras. The concentrations of commercial products sold vary somewhat, so the directions for use on each package must be read and followed exactly. You may want to try several different drugs in order to find the one that works best for you.

When treating ich, you should raise the water temperature to over

80 F. This speeds up the life cycle of the parasites, causing them to reach full size and leave the fish sooner. It is necessary that the parasites leave the fish, since the drugs used for treatment do not penetrate the fish's skin enough to harm the protozoans. It has been reported that 90 F is lethal to ich parasites. If the infested fish can stand this much of an increase in temperature, heat alone would appear to be an effective treatment.

This disease is easy to treat, but it is just as easy and less expensive to avoid.

**Thai Tropical Fish
Limited Partnership**

EXPORTERS of all kinds of TROPICAL FISH and PLANTS

INQUIRIES INVITED

No. 1595/3 Kasemsuan Lane, Chareon Nakorn Rd., DHONBURI, Thailand
Tel. 63392 & 63979
Cable Address: JUKIANGDON

Please Mention T. F. H. When Writing to Advertisers

VITA-BRITE Introductory Offer!

Three 59c size dispensers for only **\$1.00** (\$1.77 value)



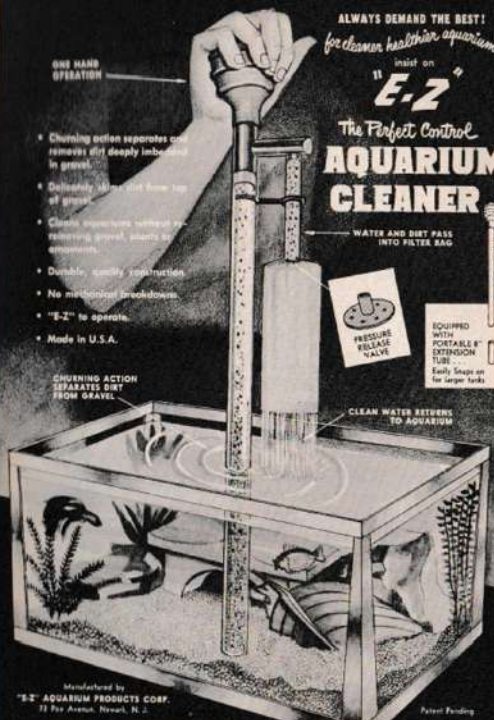
VITA-BRITE is a complete, scientifically balanced all purpose tropical fish food... especially formulated to bring out the best of color and health in your fish. Money refunded if you are not satisfied, providing you return, unopened, two unopened cartons.

Check and desired: Pellets—larger fish Three 2 1/2 oz. chns. for \$1.00
 Fine—for fish up to 1" 1 1/2 oz. chn. \$0.25
 Medium—fish 1" to 2 1/2" 1 1/2 oz. chn. \$0.25
 Coarse—fish 2 1/2" to 4 1/2" 1 1/2 oz. chn. \$1.00

Shipped prepaid—Send this order together with your money, name and address to VITA-BRITE Dept. TFH, 67 West 9000 South, Sandy, Utah 84070

ALWAYS DEMAND THE BEST!
for cleaner, healthier aquariums!

Insist on
"E-2"
The Perfect Control
**AQUARIUM
CLEANER**



ONE HAND OPERATION

- Churning action separates and removes dirt deeply imbedded in gravel.
- Delicately lifts dirt from top of gravel.
- Clean water returns to aquarium retaining gravel, plants, etc. unharmed.
- Durable, quality construction.
- No mechanical breakdowns.
- "E-2" is simple to operate.
- Made in U.S.A.

CHURNING ACTION SEPARATES DIRT FROM GRAVEL

WATER AND DIRT PASS INTO FILTER BAG

CLEAN WATER RETURNS TO AQUARIUM

EQUIPPED WITH PORTABLE EXTENSION TUBE... Easily Snaps on for larger tanks

Pressure Release Valve

Manufactured by "E-2" AQUARIUM PRODUCTS CORP. 77 Fox Avenue, Roswell, N. C. Patent Pending

Butterflies... Continued from Page 11



Chaetodon melanotus Schneider. A 4.9 inch specimen from Guam. Photo by Dr. John Randall.

from their food supply, thus my recommendation that they be kept in a tank all by themselves, if that is possible.

They are coral reef fishes for the most part, though *tinker* comes from pretty deep water. Their teeth are certainly not adapted to chewing on coral, but they probably graze on small algae and crustaceans that abound on coral reefs. They like to have their own little snug harbor, so be sure that your aquarium has a background of coral with plenty of holes for them



Chaetodon pelowensis Kner. A 3.9 inch specimen from Tahiti.
Photo by Dr. John Randall.



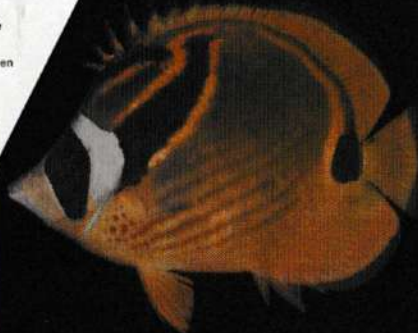
Chaetodon multinctus Garrett.
A 3.5 inch specimen from Hawaii.

Photo by Dr. John Randall.



Chaetodon lunula (Lacepede).
A 6.8 inch specimen from Bora Bora.

Photo by Dr. John Randall.



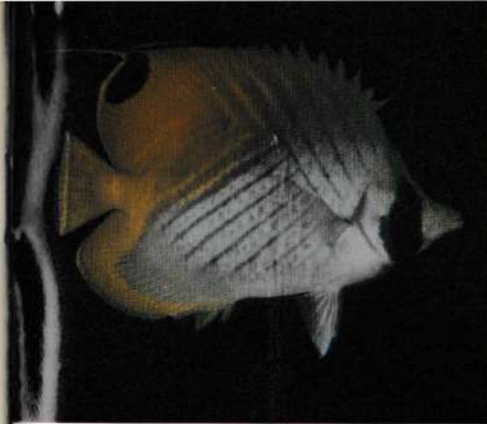
Chaetodon auriga Forskål. A 5.2 inch specimen from Tahiti.
Photo by Dr. John Randall.



to call their own. When frightened, they often freeze in position and swim slowly backwards. This backward swimming and the eyespot which many of them have has been linked to being a deceptive tactic that fools predators. I doubt it. There are too many colorful, bizarre Butterfly fishes which have no eyespot and which swim the same way. I suppose that they were able to stay alive through the generations by being able to reproduce faster than they were eaten by other fishes, and since coral reefs grow and grow and these fishes depend upon coral reefs for hiding and food, their chances of survival increased rather than decreased, and it made catching them more difficult for the open water predators.

The photographs I am presenting with this article are from my forthcoming book EXOTIC MARINE FISHES. This will be a looseleaf companion volume to the freshwater book EXOTIC TROPICAL FISHES. I hope to have it published in 1969 and once it is published, supplements will be supplied with each copy of this magazine in the same manner that supplements are available for the freshwater volume. I have been working on this book for almost 16 years and without the help and advice of Dr. Jack Randall, the book would have been another 16 years in the making! □

Chaetodon ephippium Cuvier. A 6.7 inch specimen from Bora Bora.
Photo by Dr. John Randall.





Originally identified as *Haplochromis callipterus* and so called in a supplement to *Exotic Tropical Fishes*, the fish shown here is now correctly identified as *Pseudotropheus tropheops*. Here the male, the lower fish, shows no hint of the violet-over-gold body color adopted at spawning time.

Photo by Dr. Herbert R. Axelrod.

Spawning

Pseudotropheus tropheops

BY ROBERT M. SHERMAN

We should note at the outset: *Pseudotropheus tropheops* are not community fish. They are eager to do battle with all comers. The fish is, however, a striking beauty about 4 inches long, colored deep orange gold with blue highlights on the scales. Between five and seven dark vertical bars with blue highlights on the scales. Between five and seven dark vertical bars are between the pectoral and anal fins. The upper edge of the dorsal is

black, with blue and gold tipping the spines. When ready to spawn, the male becomes deep violet with gold undertones showing through.

We had a pair for a year although definite sexing was impossible for 6 months. Sexes became obvious when the female got noticeably heavier as she filled with eggs. Attempts at spawning kept ending in near disaster with one of the pair or the other (usually the female) being badly damaged. On two occasions spawning took place while glass separated the fish. Both times the female carried the eggs in her mouth for 10 days before she became aware of their sterility.

During the last two attempts at spawning the female was aggressive to the danger point. I decided, on advice from a friend, to try a screen separator in lieu of glass with the hope that fertilization would take place through it. Shortly after the installation I noticed a difference in the behavior of the female. She was acting coyly (a distinct departure from her prior aggressive attitude). The screen was removed, and it was the male that took up the chase. This time, however, not with the intent to kill that had been apparent previously.

With this exciting development, I sat down at 8:00 PM to watch, hidden behind another tank so as not to disturb them with my movements. The male cleaned every inch of the slate bottom of the 20-gallon-long aquarium. He alternated housekeeping with chasing and when the female would hold still long enough he vibrated about her madly. All this activity lasted for a couple of hours. The female then began to show some interest and would occasionally also begin to shake.

It then seemed that the preliminaries were out of the way, and the pair was ready to get down to business. The male lay down on his side and vibrated while the female put her mouth near the very bright orange spot on his anal fin. They then changed positions, and the female did the shaking. Only one thing was missing—eggs! At 4:00 AM, still fascinated, but very weary, I went to bed.

I returned at 9:00 AM, and they were still at it, but still no eggs. At 11:00 AM the first egg was laid during one of the female's vibrating periods. She continued to lay eggs one and sometimes two at a time, then picked them up and turned to put her mouth to the spot on the male's anal fin. She made definite attempts to pick up the spot, which is the same size and shape as an egg. During this action, the eggs were fertilized while in her mouth. On occasion she neglected to pick up a few eggs, and the male then did. He'd carry them for a few minutes, then expel them to be picked up by the female. Between 25 and 40 eggs were laid. An interesting departure from normal cichlid characteristics was that at no time did I observe a breeding tube on either fish. Water conditions were hard, alkaline, and a temperature of 78° F.

Tropical Fish Hobbyist



The bright orange spot on the male's anal fin is unfortunately not clearly visible here, because the fin is held in a semi-folded position; during spawning, the spot becomes more intense in coloration and plays an important part in the spawning process, being used as an attractant to bring the female close to the male's genital pore.

Photo by Dr. Herbert R. Axelrod.

Egg-laying in most fishes generally causes little inconvenience. With mouthbreeders this is not so. With my *Pseudotropheus tropheops* however, the eggs were laid on December 3rd and on December 25th my female still had a mouthful.

I'm not sure when the eggs hatched, but I did observe on December 13th that they had. From the eighth or ninth day the female had become more and more uncomfortable, caused, no doubt, by the growth and movement of the fry. During the time she carried the fry she ate nothing. Finally a baby fish in full view. It was December 26th. A full 23 days had passed. The babies are fully formed and nearly 1/2 inch long. The female picks individual hiding places and releases the babies one at a time over a period of several hours when she feels they are ready to care for themselves. Getting rid of her charges is more easily said than done, for some do an about face and swim right back into her mouth. However, if they are free more than a few seconds, they begin to avoid her actively.

The fry, while remaining cautious and under cover for the most part, begin foraging for food immediately. Microworms will be consumed greedily. Baby brine shrimp were also readily accepted. The babies are born with the same nasty disposition as their parents, and fight among themselves almost at once.



KOI, originally bred over a thousand years ago, remained the privileged hobby of the SAMURAI, the Japanese warrior aristocracy, roughly until the end of World War II. Rightly famed for their variety, longevity, beauty, hardiness and "petability," Koi are rapidly becoming favorites among fish fanciers. The symbolic Koi, so goes the story in Japan, is a warrior-like fish: Strong, courageous, protective and chivalrous, acting like a true knight. However, should fate decide against him he will accept his misfortune gracefully. Just try to catch one and see the fight he will put up . . . but once in your hand he will submit himself to you most charmingly.

WE CARRY ONLY KOI IMPORTED FROM FAMOUS JAPANESE KOI FARMS. WE KEEP 30 VARIETIES OF KOI FOR YOUR AQUARIUM AND GARDEN POND IN STOCK AT ALL TIMES.

SAMURAI PRODUCTS. (high-quality fish foods, aquarium and pond accessories and specialty items) are manufactured with the fish hobbyist in mind.

WRITE FOR OUR COMPREHENSIVE BROCHURE AND PATRONIZE YOUR PET STORE. WE WILL GLADLY RECOMMEND RETAIL OUTLETS IN YOUR AREA.



CALIFORNIA KOI COMPANY

7708 N. Banna Avenue, Glendora, California 91740



Contest Winners

Submissions for the photo contest have been rolling in with gratifying frequency, to the extent that we've been toying with the idea of extending the space devoted to the contest from one page to two pages in each monthly issue. Maybe we'll make separate categories for fresh-water and salt-water entries . . . it all depends on space limitations and the quality of photos received. In any event, next month we'll publish the names of the annual grand prize winners, covering winning photos published from the beginning of the contest through the December, 1968 issue. Here are this month's winners.



Close-up by R. Johnston, London, England.

Landscape by Johnny Cowen, Shreveport, Louisiana.



February, 1969

Your name should be on the cover of this magazine

tropical fish hobbyist



NOW 100 PAGES

If it isn't, mail the coupon

Subscribers receive every issue of TROPICAL FISH HOBBYIST without fail.

Subscribers are kept informed about every important development in the aquarium hobby . . . the new fish, the new people, the new products, the new techniques . . . every month.

They also know that they'll always be up to date with their free supplements to EXOTIC TROPICAL FISHES.

Subscribe NOW to TROPICAL FISH HOBBYIST, the biggest (more pages, more pictures, more information, more readers), most colorful (a minimum of 24 color pages in each issue), most interesting aquarium magazine in the world.

TROPICAL FISH HOBBYIST
245 Cornelson Avenue, Jersey City, N. J. 07302

Enclosed please find check, money order or cash for:

- Sample copy - \$.50
 12 issues of Tropical Fish Hobbyist, \$ 4.00
 24 issues of Tropical Fish Hobbyist, \$7.00
 60 issues of Tropical Fish Hobbyist, \$ 15.00

Name _____

Street _____

City _____

Foreign Subscribers: Add 60¢ per year's subscription. State _____ Zip _____