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In his excellent book *Garden Pools*, author Paul Stetson leads the reader through the intricacies of setting up both formal and informal garden pools, describes the most popular and beautiful of the many colorful water lilies that can be grown in garden pools, and lists some of the other animals and plants that can be given homes in water gardens. Apart from the information given on general good water gardening practice, author Stetson gives many helpful suggestions and answers some of the most practical questions that would be of interest to anyone contemplating living up the landscape of his home with a garden pond. For example, the book has a complete section devoted to ordering fishes and plants.

Besides being a valuable guide to water gardening as it is concerned with water lilies and other plants commonly associated with garden pools, this book is also valuable for its treatment of Goldfish and the new hybrid Carp developed by Japanese breeders, Koi. There are sections on feeding and breeding Goldfish.

Other topics covered in the book include: the construction and care of garden pools, planting and care of water lilies, and summer care and maintenance of the pool.

## TROPICAL FISH HOBBYIST

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Sally from the South Seas, p. 67.

**COVER**  
One reason that platas have always been favorite to the great variety of colors in which they are available. The fact is, you could check a fairly large apartment with lots of platas, each one of a different color. The three platas on our cover are representative of all the other new color varieties. The bleeding heart wagtail platy. You may have seen it in your local pet shop, for the type has recently been made available to dealers. Hobbyists seem to like these subtly colored little beauties, for they have been having them on first. For complete details about the bleeding heart wag, turn to page 9. Photo by Dr. Herbert R. Axelrod.

**EXOTIC TROPICAL FISHES SUPPLEMENTS**  
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### EDITORIALLY . . .

It has always been my contention that fish hobbyists are an intelligent, well-balanced and eminently nice crowd. I often wondered if some day I might find a person who could be described accurately as a "fish-nut," a term I abhor. As if in answer, I read about a hobbyist in Illinois who kept several thousand fish in a four-room apartment and allegedly beat his wife when some of them died. She sued for divorce, saying he had spent about \$2,500 on his hobby, and the apartment was so crowded with tanks that it was uninhabitable for the couple and their four-year old son. Pending the divorce, she asked for an injunction to restrain the man from buying more fish.

Far be it from me to say that this guy's got all his buttons, but let's look at this thing from his point of view for a moment. Take a man who feels that his wife is being just a bit cool toward him. Under such conditions, men will do the darnedest things to get a little attention. No, I don't condone wife-beating; that I will admit is a rather extreme way for a man to get his wife to notice him. The natural reaction would be to turn elsewhere: Another woman? No; this is both immoral and easily observed. A dog? Not a bad idea; a dog demands little and gives much affection in return. But, in a large city, a dog must be walked daily, walked no matter what the weather. A tankful of fish is a logical answer, and we all know that one tankful leads to another.

So, a word to the distaff side: If hubby is paying more attention to his fish than he is to you, don't be too hasty to condemn him. Just act as if he existed!

*William Vorderwinkler*

Guidance for beginners.

## How Many Fish Per Gallon?

BY WILLIAM VORDERWINKLER

There is not one fish hobbyist I know who has not run into trouble at some time or other by trying to get too many fish into one tank. Many letters reach my desk asking me to analyze some trouble the sender is having; at the end of the letter, as a sort of afterthought, the writer tells me that there are about three or four times as many fish in the tank as there should be. Should there not be a rule which will guide the beginner, one which will warn him when he is exceeding the limits of safety? Many works quote the old Goldfish rule of thumb: "An inch of fish for each gallon of water." What they do not say is that this applies to Goldfish and other cold-water species, but not necessarily to the warm-water fishes which most of us keep. With most tropical species the oxygen requirements are not quite as great, and the rule of thumb can be relaxed a bit to: "An inch and a half of fish to each gallon of water."

This of course is a generalization, and like many other generalizations it does not hold true in every instance. Take a Beta, for example. Being a Labyrinth fish, it is not completely dependent upon the oxygen supply of

Because bettas can go to the surface and take air directly, they can live comfortably in a small container. Other popular fishes that take air directly from the surface and stand crowding fairly well include paradise fish and gouramis. However, the hobbyist should keep in mind that crowding is never desirable. Photo by Dr. Eduard Schmidt.



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the water in which it swims. It comes up frequently to the surface and gets a gulp of atmospheric air; for this reason a 2½-inch Betta can be kept quite well in a pint of water, while the rule says that a 2½-inch fish should have about 1½ gallons of water! By and large, however, the rule holds good for most fishes.

Another fish with special space requirements is our old friend the Black Molly. A great many hobbyists are attracted by its velvety-black color and try to put them in an already crowded community tank, with the result that they frequently contract disease or do not grow to a satisfactory size. In order to keep them in the way that they really should be kept, Black Mollies would have to be put in a tank that contained so few that it would be boring to watch!

The expression "one inch of fish" must also be treated with a certain amount of flexibility. Naturally, it would take more oxygen to support an inch of a stocky-bodied fish like one of the Cichlids than it would take for something slender, like a Coolie Loach! Here again, allowances must be made.

Another thing we must remember is that the amount of oxygen in an aquarium varies with such factors as temperature of the water and even the time of day. Thanks to the fact that now just about everyone has an air pump which operates a filter and maybe an air-stone besides, the oxygen content of the water in an aquarium today is much more constant than it used to be. A thickly-planted aquarium which has no mechanical aeration whatever can present a situation whereby the plants give off some oxygen during the daytime, but at night the oxygen content drops considerably and the plants compete with the fish for it. Most fishes are active in the daylight hours and their oxygen requirements are greatest when there is the most oxygen present, but a number of fishes with nocturnal habits could easily cause grief in an un-aerated tank which has a high fish population and is heavily planted.

To sum up, let me give the hobbyist a bit of advice. Before you add to your fish collection when you see something you like, stop to think a moment first and ask yourself if you have room for what you want to add. Remember that it is better to have an uncrowded aquarium which contains the proper number of healthy fish than to have an aquarium which is crowded with sick ones!

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In young bleeding heart wag tails that are approaching their prime the "bleeding" blush begins to spread from the lower body to the upper body, head, and back. Photo by Dr. Herbert K. Axelrod.

### The Bleeding Heart Wagtail Platy

BY MARK ROSE

There's a wonderful new fish available to the hobbyist who appreciates the beauty of subtle coloration and perfect temperament. The fish is called the bleeding heart wag, a type of *Xiphophorus maculatus*. This wag is the result of a number of crosses between the bleeding heart platy and the gold wag platy. The credit for its creation goes to Mr. Joseph Cooley, an experienced and skilled breeder.

This is truly a fish for the hobbyist with sophisticated taste. Young, sexually immature males have all-gold bodies. A pink hue develops on the belly and sides more or less before the gonopodium begins to form. The hue deepens rather rapidly to a softly glowing orange-pink which is solid on the belly and lower sides and usually forms rather ill-defined bands on the upper sides. Often at this stage a



Compare the coloring of these three bleeding heart wags. The young male (bottom) still shows its indistinct bands. The fully matured male (center) has developed the overall "bleeding" black. The female (top) is light golden yellow with black markings on her back. Photo by Dr. Herbert R. Axelrod.



The bleeding heart wag exhibits a subtle blend of the colors of the two strains from which it was developed, the gold wag play (above) and the bleeding heart play (below). Photo by Dr. Herbert R. Axelrod.



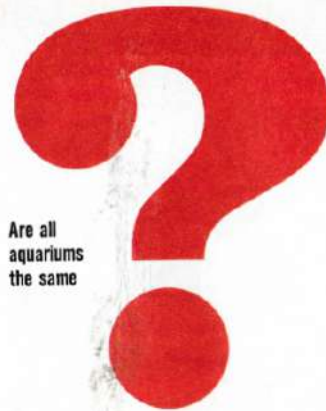
Mr. Joseph Cooley, the man who crossed the bleeding heart platy with the gold wag to get the bleeding heart wag. Photo by Dr. Herbert R. Axelrod.

similarly colored band is present near the caudal base. As maturation continues, the glowing hue spreads over the entire front portion of the body, the head, and the lower third of the dorsal fin. The bar at the caudal base usually fades away almost entirely.

The female bleeding heart wag lacks the glowing hue of the male but is by no means unattractive. She is tinged over all her body with a light golden yellow which darkens somewhat at the head and back. A pattern of black dots or lines marks the back and upper sides. Both the male and female have dark black lower lips and caudal fins. All the other fins are marked attractively with more or less black too.

Breeding procedures are the same as with other platies and the strain breeds true. The female will do fine in either a large breeding trap or a well-planted tank. The fry do particularly well on a diet of newly hatched brine shrimp and fine dry food. If fed properly, males will begin to color up within 2 or 3 weeks.

When your brood reaches adulthood, you'll probably find that you want to keep them all, they are particularly attractive when kept together in large numbers, and, as with most platies, they are not at all aggressive.



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## About William "Fred" Kyburz

BY WILLIAM RIESE

Just before last month's issue of TFH went to press, word was wired to the Jersey City office that William Kyburz had passed away. Two articles, one by Kyburz and one by Dr. Axelrod, about a recent visit Dr. Axelrod and I made to Kyburz appeared in that issue along with a last moment notice on Kyburz' untimely death. The notice mentioned that further details were being sought as to the circumstances of Fred's (he preferred to be called Fred rather than William) death.

I asked Dr. Axelrod if I might write the last story about Fred and he consented even though I think he would have liked to do it himself. The information I am about to give is drawn not only from my personal knowledge of Fred but also from a letter written to Dr. Axelrod by Fred's brother, Juan Kyburz.

One thing stood out above all others about Fred Kyburz. He was at peace with himself. By this I mean that he knew what he was and what he wanted out of life. There are few such people, and if you have ever met one you know what I mean when I say that this aspect of Fred made it impossible not to like and respect him a great deal as a person.

Fred was born on January 10, 1900 in Zurich, Switzerland. He completed primary and secondary school and studied for 3½ years at the Superior School of Commerce in Zurich. As a boy, his hobby was keeping tropical fishes. From 1917 to 1919 he worked as a merchant in Switzerland. In 1920 he began work as a merchant in Manila, but he had to give up this position due to illness. From 1920 to 1923 he worked as a foreign correspondent in Barcelona, Spain. From 1924 to 1932 he worked in the San Salvador office of the Manufacturers Trust Co. of New York. From 1933 to 1939 he worked and traveled in and around South Africa, Central America, Australia, and the islands of the South Pacific.

On June 19, 1939 Fred arrived in Colombia, the land in which he was destined to die. At first he worked as a translator for the newspaper "El Relator" of Cali. After a short time, however, he joined the Aznazu Gold Mining Co. in the Cauca Valley. In 1940, still searching for work and a way of life that would make him happy, he bought a farm in Bitaco. Here, he dedicated himself from the start to the culture of strawberries for marmalade. Living close to nature suited him, and in later years he returned to his boyhood hobby and started to



Fred Kyburz was the kind of man who was respected and liked by both young and old. Although he lived alone quite happily, he enjoyed showing guests around the "tangle paradise" that surrounded his home.

search for and export fishes. His great skill with fishes and his dedication to the hobby was known to few people other than those of us who dealt with him in this area.

A few months ago, Fred began to complain of "asthma attacks." A doctor prescribed some pills, but he also recommended that Fred see a heart specialist. The pills worked well, so Fred put off seeing the specialist. During the night of the 24th of January, Fred suffered severe chest pains and was brought to his brother's home. As his sister-in-law opened the door for the doctor that had been called, Fred died of a severe heart attack.

Those who know Fred will always remember him as a man of great integrity, a man of courage, and a man who had fought hard to find a way of life that he could enjoy . . . a way of life that was snatched from him all too quickly.

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## The Body-Wag, an Innate Behavioral Characteristic of Bony Fishes

BY DR. GEORGE S. MYERS

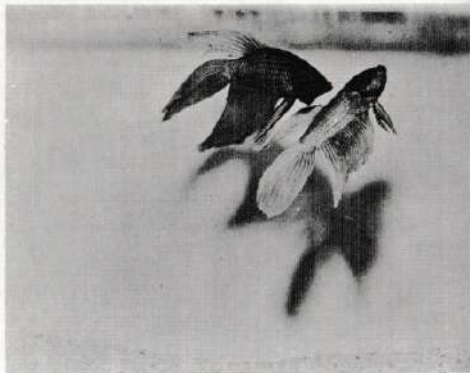
Those who observe live fishes take it for granted that different types of fishes have different habits—different ways of swimming, spawning, eating, etc. Just as the ornithologist can often identify the taxonomic family to which a distant but visible bird belongs solely by the way it flies, so the ichthyologist can often recognize the family to which a fish belongs by its movements. Many behavioral patterns are quite as characteristic of certain types of fishes as are the points of anatomy that are used in classification.

During the past 30 years, the whole science of animal behavior has grown up, with a complex terminology used in the analysis of behavioral sequences and patterns. Most of the researchers in this field, however, even those who work primarily with fishes, are much too occupied with meticulous study of a few species to become acquainted with behavioral characteristics of fishes in general. For this reason, they have failed to notice that certain of these behavioral acts appear to be much more deep-seated than others. Some, indeed, seem to occur throughout all or nearly all the modern types of bony fishes (teleosts) and thus may be far more unchanging during evolution than most anatomical characters.

The one I wish to mention is one that I call the body-wag. When two male fighting-fishes (*Betta*) line up beside each other, spread their fins, and project the gill (tranchiostegal) membranes below the throat, they then go into an apparently tense, stiff-bodied, jerky "body-wag"—before breaking off the display and attacking. Much the same maneuver is exhibited by the cichlid fishes, upon which so much behavioral research has been conducted.

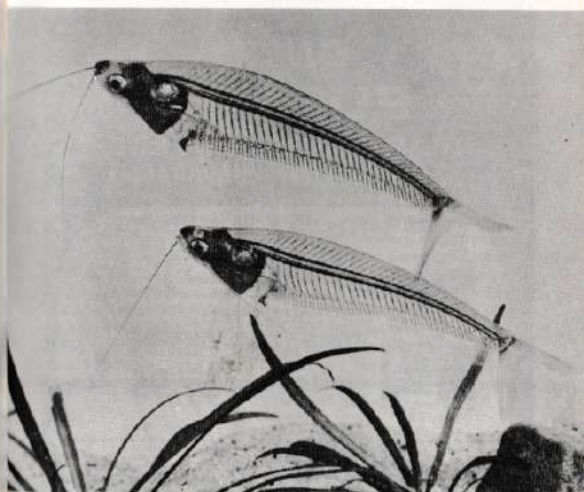
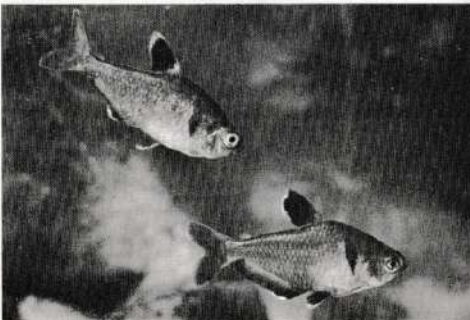
Those behaviorists who have worked primarily with cichlids and anabantoids have apparently had no reason to assume that this stiff, jerky body-wag, given with expanded fins and lowered gill membranes, is more widespread among fishes than the taxonomic families with which they have worked. However, the body-wag is much more widely characteristic of teleost fishes than has ever been noticed.

I have seen what is obviously the same stiff body-wag (called *tail-wag* by Baerends) in many displaying or fighting Cichlidae, Centrarchidae, Belontiidae (=Anabantidae, in part), Pomacentridae, Serranidae, and other families of spiny-rayed percid fishes. I have observed it in the long-jawed goby (*Gillichthys mirabilis*), in a gadid, and in both Poeciliidae and Cyprinodontidae.



Just before two male fighting-fishes begin to fight, they display the tense, stiff-bodied, jerky body-wag. Photo by G. J. M. Timmerman.

*Hyphessobrycon callistus*, another species in which the author has observed the body-wag. Photo by Gustav Serff.



The author was surprised to observe the body-wag in the glass-catfish, *Kryptopterus bicirrhus*. Photo by Milan Chvojka.

More surprisingly, I have observed it in a number of Cyprinidae, notably some *Notropis*, *Barbus paripentazona*, and *Brachydanio rerio*. It is common in the Characidae, notably in *Hyphessobrycon callistus*. Most surprising of all, I have observed it in the small glass-catfish, *Kryptopterus bicirrhus*, at dusk, when these fishes become much more active than in daylight.

This maneuver, which is much more than a mere tail-wag, would appear to be a common characteristic throughout the teleosts, although it often becomes part of a more complicated display or combat pattern which differs considerably from family to family and order to order. Undoubtedly there are certain groups of bony fishes which do not display the body-wag (possibly eels do not), but its general occurrence would lead one to suspect that teleosts which do not display the body-wag have probably lost the characteristic by the evolution of body forms or behavior not suitable for its expression.



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A biographical sketch

**Dr. George S. Myers**

You have read and enjoyed many of Dr. Myers' articles in this magazine. He is one of the most popular of our regular contributors and, if the questions we receive in the mail are any indication, many of you are interested in finding out more about him.

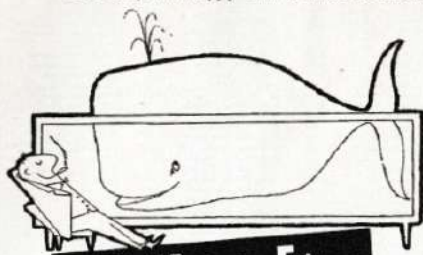
Rarely have the qualities of the perceptive aquarist and the dedicated ichthyologist been so successfully combined with those of the brilliant, incisive writer as in Dr. George S. Myers. Born in Jersey City on February 2, 1905, he became interested in tropical fishes during his boyhood, and in his teens was publishing his first articles on aquarium fishes, going to aquarium society meetings, and spending long hours at the American Museum of Natural History. It was only natural that young Myers should travel clear across the continent to attend Stanford University, where the most famous of American ichthyologists, Dr. David Starr Jordan, had developed a whole school of ichthyology. Jordan, a student of the great Swiss-American zoologist, Louis Agassiz, in turn a protégé of the Emperor Napoleon's chief scientist, Baron Cuvier, had trained dozens of fine ichthyologists who were to dominate American ichthyology for several decades. Myers was to continue

Dr. Myers at his desk at home.



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Dr. Myers chats with his friend, the well-known scientist and author Dr. Martin Britton.

in this tradition. Awarded an AB degree in 1930, he received an MA in 1931, and a Ph.D. two years later for a classic work on the egg-laying cyprinodonts. The same year he returned east to become assistant curator in charge of the Division of Fishes of the U.S. National Museum. In 1936 the opportunity arose for him to join the faculty of Stanford, where he has remained ever since and is now Professor of Zoology, training many of the country's best younger ichthyologists.

Dr. Myers has been a member or director of many expeditions and research teams: Mexico, 1929; Death Valley, 1930; West Coast of Central and South America, 1938; deep-sea research, 1938; Brazil, 1942-44, 1949-50; Bikini, 1947. He has traveled extensively in Europe, Asia, and Australasia. Dr. Myers is a member of several scientific societies. He has been editor of the *Stanford Ichthyological Bulletin* for many years.

Dr. Myers' versatility is surprising. Not only is he an authority on fishes, reptiles and amphibians (particularly frogs), tropical fishery biology, zoogeography (where his analysis of fish distribution has been fundamental to all subsequent work), vertebrate paleontology, and evolution, but he is also interested in art, literature, and history. He speaks excellent Portuguese and draws well.

Dr. Myers has described literally dozens of aquarium fishes, among them the red tetra from Rio, the neon tetra, and the ramirezi cichlid. His interest in aquarium fishes remains as strong as ever.

A beautiful and popular labyrinth fish.

### A Photographic Record of the Spawning of the Dwarf Gourami

BY R. ZUKAL  
Brno, Czechoslovakia  
Photos by the author

The Dwarf Gourami, *Coina labia*, a member of the family Anabantidae, is one of the most beautiful and most popular of the aquarium fishes. It is only about 2 inches in length, and the gleaming colors of the male, plus its peaceful nature and hardiness, help to give it this exalted place. It is a bubbler builder which is not hard to maintain if the temperature is kept above 74°F and the aquarium contains aged normal tap water and dense planting. An aquarium intended for breeding must be well covered.

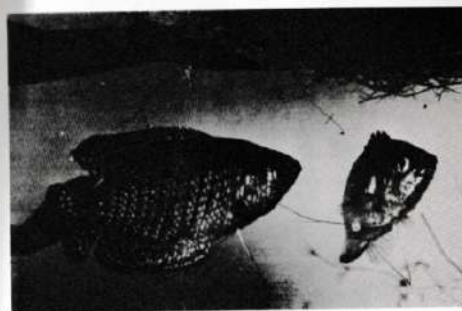
For breeding it is advisable to use fish which are more than a year old. An all-glass aquarium of about two gallons capacity and without anything on the bottom is fully satisfactory. Some floating plants should be placed on the water's surface; to protect the female from the occasionally vigorous advances of the male, it is advisable to place a thicket of plants within the tank. The temperature should be 75 to 78°F.

The male should be placed into the spawning tank in the evening, and the following morning the female. Spawning usually takes place on the same afternoon if both male and female are ready. If there is no spawning in three days, it is advisable to replace one of the partners.

While building the bubbler, the male forces the female into a corner of the aquarium, frequently interrupting his work to butt her in the belly region or nip her anal fin. The bubbler is composed of small mucus-covered bubbles and is frequently located among floating plants. The bubbles are formed from air which is held in the labyrinth, exuded by the salivary glands. The nest is interwoven with bits of plants and is quite strong. During construction the nest becomes gradually higher and extends up to an inch above the water's surface.

I was able to make an interesting observation while photographing fish making preparations to spawn. While building the nest the male swam quickly toward the bottom and then stopped when he got near it and bent his whole body in an arc for a few split seconds. This was repeated several times. It seemed to me that he was doing a "limbering up" exercise for the spawning that was about to take place.

When nest-building had progressed fairly well, the female was coaxed under the bubbler or even forced a bit if necessary. Again and again the female was approached by the male, who spread his fins and assumed an



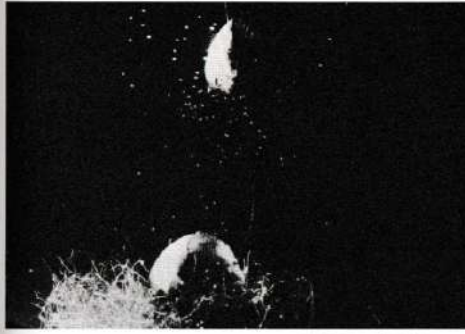
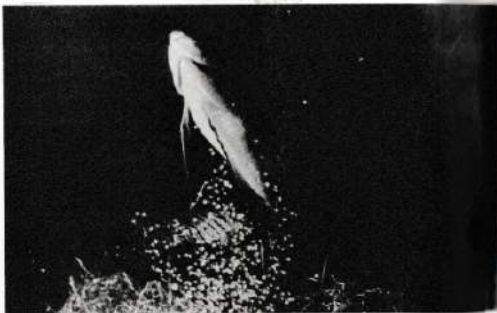
The male, left, puts on his most gorgeous colors to win the female's favor. Here they are under the bubbler, into which so many bits of *Nitella* have been woven that the bubbles are scarcely visible from below.

The first maneuvers consist of "false," or "dry," matings. At first the male wraps his body around the female.

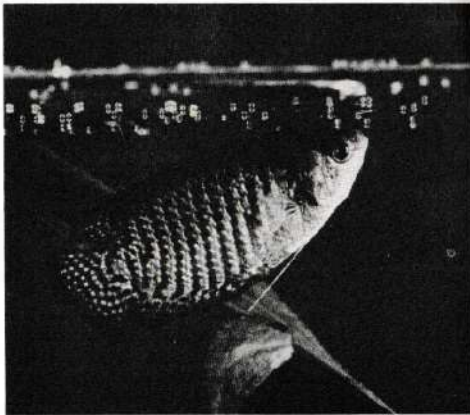




When spawning is over the male guards the nest, even driving his mate if she approaches. To avoid further, she should be removed from the breeding tank. Although the male is in the center of the egg mass, many will probably escape. Any wonder that the female drifts motionless and exhausted to the bottom? After laying 50 of this mass of eggs, it



Not all the eggs float up, however. The male becomes very busy at this stage, picking up the falling eggs and spitting them up into the nest. The female begins to happen in earnest. The female is on her back and the eggs are beginning to be discharged. Note how they float upward into the nest.



Eggs are constantly floating out of the nest, and it is the male's duty to pick them up in his mouth and spit them back where they belong.

imposing attitude. At last the female was willing and came under the nest for a few false matings. The female swam under the male, who folded his body about hers and turned her on her back. The first few attempts resulted in the female's sliding out of the male's embrace. With vigorous butts and bites the female was forced into further matings. Then at last the right place was found under the nest and the beautiful love-play began. The female was turned on her back and held tightly by the male, and the eggs were seen leaving her body. They were fertilized by the male and rose to the surface; some sank and were picked up by the male, who spat them back into the nest.

After each mating the female remained in a cramped position under the nest or sank weakly to the bottom. Matings were repeated frequently and lasted one to two hours. Once she is finished, the female should be removed. The male takes over the brood care. Fry hatch 24 to 36 hours after the spawning. The water should not be deeper than 6 inches. After the fry hatch the male should be taken out. On the fourth day the little ones swim freely and feeding must be begun. They are very tiny, and their live food must be finely sifted.

## Want an Aquarium Society?

By William Vorderwinkler

Aquarium hobbyists are a very gregarious lot of people. It's very little satisfaction having your Rasboras spawn for you if you can't brag a little about your accomplishment, and if you're a true hobbyist you'll want to pass on what you have learned to other, less fortunate people. I am sure you have found as I have that the aquarium hobby is chock-full of people who are very anxious to swap experiences with others who have the same interests, and are actively enthusiastic about this wonderful hobby of ours.

It is difficult for a person who is within easy traveling distance of a half-dozen aquarium societies to put himself in the position of a hobbyist in a smaller, more out-of-the-way community who wants to share his enthusiasm with others and is trying to start a group in his town. I frequently get letters from such people asking how to get an aquarium society started and how to run it. This article is an attempt to help with a few suggestions. The rest is up to you.

Your local pet dealer can be a great help to you in starting things going. Point out to him that an aquarium society in your community would be a valuable asset to his business, and he will be sure to do everything he can to give your group the initial publicity it needs. A sign prominently displayed in his store will do the trick. This sign should announce your intentions and invite interested persons to get

in touch with you. This should give you a handful of interested hobbyists to start with. A meeting should be arranged in the home of one of the group, and there it can be decided how things are to be done. Small groups generally meet at first in the homes of the various members, and if things go well there will soon be too many to accommodate in this way. A small cash contribution should be made to defray the expenses of coffee and other refreshments. Choosing a chairman to preside at the meetings, a secretary to take notes and handle correspondence, and that most important of persons, a treasurer to handle the money, will be your first tasks. Meetings may be run informally at first, when the group is small. Don't make the mistake of letting the society business run the entertainment into the late hours.

When your group has grown to a point where there are too many people to entertain in the average member's home, it becomes necessary to look for a meeting-place. Many churches have a hall which they are willing to rent or donate for monthly meetings; there are also veterans' organizations, the Y.M.C.A., and lodge halls available in most communities. Pick a spot where your members have only a short distance to travel, which at the same time is roomy enough for your group (be generous in your estimate here; you must count on new members!). The price should



not put too great a strain on your treasury. One thing worth checking is this: your group, don't forget, is an educational one. You are making a study of aquarium life and its habits. Schools, libraries, museums and similar organizations frequently even donate the use of a room with the sole stipulation that your group leave the room the same way they found it, and that if a guard or janitor has to be there to lock up after you, that he be paid for his services.

Meetings can be held in a very simple and informal manner, but certain points must be covered. The chairman calls the meeting to order, and then the secretary reads the minutes of the previous meeting. If the minutes are accepted without any additions or corrections, the meeting continues with the discussion of the business left unfinished from the previous month, followed by business scheduled to be taken care of at that meeting and, if there is any, a discussion of business to be handled in the future. When this is taken care of, whatever entertainment scheduled is presented. When the entertainment is over the meeting is adjourned, refreshments are served for the members and guests, and the real meeting begins over the coffee and doughnuts when the members discuss things among themselves.

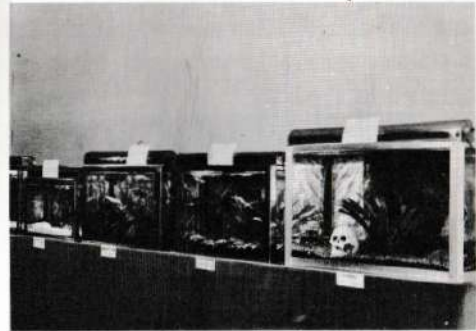
Entertainment presents the most knotty problem for most aquarium societies. Some groups are fortunate to have within them a few really experienced hobbyists who can give talks on aquarium management and the various fish groups. There are some motion pictures available which depict life in fresh water, but

these are unfortunately very few. A good evening's entertainment can be had by having one of the experienced hobbyists lead a discussion on fish-keeping, with the members asking questions and giving their own experiences. If your group includes youngsters, remember that they have to get back home at a reasonable hour, so limit the time accordingly.

Then there is the ticklish question of money: your organization is not in existence to make money, but it must be self-supporting. Dues must be adequate to cover expenses, but not so high that people would be deterred from joining. Some money can be set aside for a monthly door prize, and frequently some of the members have a few surplus pairs of fish which they would be happy to donate. Most societies hold a small raffle at each meeting, but be sure to get permission from the owner of your hall to do this. When the treasury grows to a point where the club can do a little spending, you can plan some activity like a picnic, a dinner or an excursion to a public aquarium.

As your organization continues to grow, you can get a fairly good idea of what your members want and how to give it to them. Whether or not you are succeeding can be gauged by the attendance at meetings and whether you are gaining or losing members. There are some state federations and even an international federation to help you with your problems. Biggest is the International Federation of Aquarium Societies.

Many societies enjoy putting out a publication. This entails a lot of work and requires the services of



Most societies keep a number of small tanks (or bowls) which they set up for use in their monthly fish competitions.

people who are interested in writing for your little magazine. Usually after a few months a very small handful of people are left to do this work and frequently it falls by the wayside to die of starvation. Nevertheless, many fine publications by aquarium societies have persisted for many years and are still going strong. It requires enthusiasm and not a small amount of stamina and inspiration. If you have a few members who would consider this a labor of love, fine and dandy!

Another popular feature at aquarium societies is the monthly fish competition. Each month a popular aquarium fish is chosen to be in competition the following month. The members bring in their best specimens and the winners are presented with ribbons. At the end of each year there is a trophy for the

winner of the most awards.

A little thought will turn up many more ideas as to what to do at your meetings. Speakers can be brought from a distance (if your treasury can stand it!). The author has had the pleasure of addressing groups as far away from his home in New Jersey as Hamilton, Ontario and several times in Pittsburgh. Most speakers merely ask that their expenses be paid, knowing that the aquarium societies do not have large treasuries as a rule.

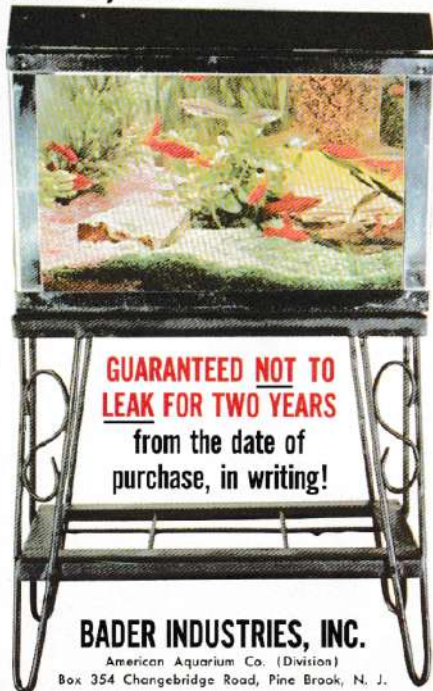
These few hints should serve to get your aquarium society started and rolling. The rest is up to the individuals who comprise it. All in all, it's a pleasant experience to attend a meeting and become one of a group with the same interests and enthusiasm. Half the fun of being a fish fan is talking about it.

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# MAIL CALL

By William Vorderwinkler

If you have an aquarium question and cannot find the answer in any of the standard reference texts, send it to MAIL CALL. Each month this column will publish the most interesting questions received and their answers. Letters containing questions cannot be acknowledged or answered personally. Address all questions to: MAIL CALL, T.F.H. Publications, Inc., 245-247 Cornelison Ave., Jersey City 2, N. J.

### Pantius, Barbodes or Capoeta?

Q. 1. I have been wondering if they have come to any conclusion about calling the bumblebee goby *Brachyogobius nana* or *Brachyogobius xanthozona*; which is the most frequently used?

2. What is the scientific name of the hoplo or porthole catfish? This is the one that resembles *Diosoma unstriata* except that it doesn't have stripes on the tail.

3. On what exact day was *Brachydanio frankel* first found and have any been imported into the United States?

4. What is the scientific name of the T-barb, *Barbus lateristriga* or *Pantius lateristriga*? How about the rosy barb, and what is the scientific name of the new H-barb?

5. What is the scientific name of the banana plant?

6. What is the fin-ray count on *Leporinus fasciatus*?

7. How many species of discus are there now?

8. Could you please tell me how I could get a pair of *Hemigrammus vorderwinkleri*?



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9. Has the name of neon tetras been changed from *Hyphessobrycon innesi*, or cardinal tetras from *Hyphessobrycon cardinalis*?

Kent O. Kurtz, Millbrae, Calif.  
A. 1. There are four species of *Brachygonius*: *B. doriae*, *B. xanthozona*, *B. muriei* and *B. aggregatus*. They have different body markings but are all sold as *humboldt* fish.  
2. *Hoplosternum thoracatum*.



*Hoplosternum thoracatum*

3. I cannot pinpoint the day, but the species was identified as *Brachydanio frankelii* by Meisner in 1963. They were being sold as "gold danios" by dealers in Russia previously. Yes, they have been imported into this country and I have seen them, but don't ask me where to get them now!



*Brachydanio frankelii* pair

4. Let's get this straight: Dr. Leonard P. Schultz split barbs into these cate-

gories: no barbels, *Puntius*; two barbels, *Capoeta* and four barbels, *Barbodes*. This makes the 7-barb *Barbodes lateristriga*, the rusty barb *Puntius conchonius*. The H-barb is merely a sport of *Capoeta tetrazona*.

5. *Nymphaoides aquatica*.



Banana plant, *Nymphaoides aquatica*

6. Dorsal ii, 10; anal ii or iii, 8; pectoral i, 15 or 16; pelvic i, 9.

7. *Symphysodon aequifasciata* aequifasciata, *Symphysodon aequifasciata* axelrodi, *Symphysodon aequifasciata* haraldi, *Symphysodon discus*.

8. *Hemigrammus vorderwinkleri*, to the best of my knowledge, is not being offered at present.

9. Neon tetras are *Paracheirodon innesi* at present; cardinal tetras were named *Hyphessobrycon cardinalis* in German publications but are now officially *Cheirodon axelrodi*.

**Causes of fish deaths**

Q. For several years I have had the same trouble with my fish. For a time they do well in the aquarium, then half of them die with no particular reason. I wondered if you knew what causes this. The last time this happened the aquarium did well for 4 months. It is a 20-gallon aquarium with two sub-gravel filters. I had a pair of bettas, a pair of

red swords, a female angelfish, a pair of waltails and a pair of gold moon. The temperature was 78°F. Do you have any idea as to what caused this, and how to prevent its recurrence?

Garry Jenkins, Mimico, Ont., Canada.

A. There could be any number of causes. Here is a little stunt that works fairly well against any number of problems that develop over a period of time: about once a month, change about 4 or 5 gallons of your 20-gallon tank. Be careful that the water you add is of the same temperature; it can be fresh tap water, if you like.

**Unusual survival**

Q. About 4 weeks ago I placed four very young (about 8 weeks old) zebra danios in my young piranha's tank. He is only about two inches in length. The tank was 10 gallons in capacity, 78°F., slightly acid and well-planted. As far as I can tell, he ate the babies. Just about two weeks ago I removed two

adult zebra danios which the piranha either couldn't or didn't wish to eat. Yesterday as I was feeding my piranha I noticed an extremely small fish swimming near the surface. Then I saw that there were two. I removed those two baby fish to a 3-gallon tank that had conditioned water in it. They are doing

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fine. About 6 weeks ago I had bought new Amazon swordplants. Do you think that the zebra laid eggs or could they have been carried in on the plants?

Jeffrey Buena, Floral Park, N.Y.

A. Piranhas have some strange habits. We once had one about 4 inches long in our office. Thinking to give him some tidbits we put in about six baby guppies. Next day the baby guppies were untouched and swimming on one side of the tank, while the piranha was on the other side, covering in a corner. No doubt your adult zebra laid eggs and a lot more than two hatched, but the rest were eaten either by the piranha or by the parents.

**Chinese evergreen**

Q. In a 20-gallon aquarium I had three zebra danios, four baby angelfish, five

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neon tetras, three cardinal tetras, three white clouds, three rasboras and a catfish. Ever since putting in these fish I have been losing rasboras, white clouds, neons and cardinals one by one. I can't understand this as I feed brine shrimp and a variety of prepared foods and the water is on the acid side. Could you please tell me what I am doing wrong? Recently I purchased a plant that the dealer told me was a Chinese evergreen. Could you tell me more about this plant? Congratulations on a fine column in a fine magazine.

Franz Vail, Shelby, Ohio.

A. Everything else you did seems all right, but you did make a mistake getting that Chinese evergreen. This is not an aquatic plant and dies in the water, causing a lot of trouble.

**Bleeding heart tetra**

Q. 1. Is there any possible way of sexing pearl gouramis (*Trichogaster leeri*) when they are about 2 months old?  
 2. Has the pencil fish (*Poecilibrycon auratus*) ever been bred?  
 3. I bought a fish which the man at the pet store called bleeding heart tetra. I looked into several books and couldn't find it described. Is it a recent importation? It has a blood-red spot on its body about a half inch behind its head.

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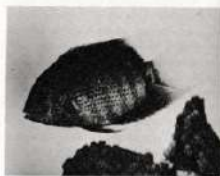
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4. I have a pair of black-striped fish called severums. Are these young *Cichlasoma severum*?



*Cichlasoma severum*

5. I have two red-tailed sharks. How long would you estimate it would take for these 1/2-inch specimens to reach 3 inches, and how aggressive would they be at that size?

Anthony B. Ford, Salem, Oregon.  
 A. 1. Not with any amount of accuracy. When they begin to show sex, the males develop a longer, more pointed dorsal fin.  
 2. Yes, frequently.  
 3. It is possible that the works in which you looked were published before the fish

first came in and were identified (1858). The scientific name is *Hypbessobrycon rubrostigma*; it is described in Exotic Tropical Fishes on page F-350.00.

4. Let's get this business of "stripes" and "bars" cleared up first. On a fish, a stripe runs horizontally and a bar runs vertically. Your fish probably have bars and not stripes. These are very prominent in *Cichlasoma severum*, especially when young.

5. With the best of care, about 6 months. These fish are usually aggressive only toward their own kind. You might get two fish which are perfectly friendly and get along well, or two which would act like mortal enemies.



*Labes bicolor*

**Catfish change**

Q. 1. Some time ago I purchased two *Corydoras*, which I took to be *C. aeneus*. Now it seems that one has a longer snout and higher back. Is it of the species *C. aeneus*? If not can the species be hybridized?  
 2. Is there any way to sex young catfish?  
 3. Do you know of a company that ships live tubifex or daphnia?

Don Bailey, Northport, Ala.

A. 1. I have seen it often: *Corydoras aeneus* and *Brochis coeruleus* look very much alike when young, but when they get a little older the *Brochis coeruleus* becomes higher in the body and its mouth is longer. Don't waste your time trying to hybridize them: they are two separate

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*Brochis coeruleus*

genera, and it is highly unlikely that you will have any luck.  
 2. I presume you mean the *Corydoras* species. This will work only on fish that are at least three-quarters grown: look down at them, the males are slimmer.  
 3. No, your dealer probably has some arrangements that will get them shipped to him in season.

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**Betta dilemma**

Q. I am having a bit of a dilemma with my bettas. I put a male and a female in a 10-gallon aquarium to breed and the female nearly killed my best male! I couldn't understand this because the female was bursting with eggs. I put in another male who really proved who was master and they bred. The male built a nest about 5 inches in diameter, including some plant leaves. Now when I try to catch the female I almost ruin the nest. The pair don't seem to fight now, but what's going to happen later? Will the male kill the female or will they work it out until the fry are free-swimming? I have plenty of bushy plants floating around and a couple of sword plants. I am told that if the temperature is lowered the bettas will become lazy and not tend to fight. If I did this would it harm the development of the babies? The present temperature is 81°F.

Mike Fox, Detroit, Mich.

Spawning bettas



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A. When you put out a pair of fish to spawn, both must be ready, the male with his sperm and the female with her eggs. In your first attempt the female was ready and the male was not. In such a fix a frustrated female can become almost as nasty as a male. The second male was ready and was therefore accepted. Catching a female after spawning is a bit of a test of patience and perseverance. If you feel that you cannot, remember that the bubble-nest is no longer required once the fry can swim and take both parents out slim; brooklets in the male is very nervous when guarding a nest and can mistake his well-meaning mate for an intruder.

**Gold to silver**

Q. Can you help me? My goldfish has gone silver. I've fed him a number of things: daphnia, aquarium plants, lettuce, etc. Is he too old to stay gold? He's 10 inches long and very fat. Does he need to go on a diet? Is this natural?

Kathleen Pool, Newton, N.J.

A. I've heard of countries going off the gold standard, but fish! There are color changes that take place in young fish, but a 10-inch fish usually holds its color. Probably he has become fat not only because he has gotten plenty of food, but because he does not get much exercise in his aquarium. Keep his water clean and fresh and do not feed him more than he can clean up in 5 minutes. Maybe he'll go back on the gold standard in time.

**Success with blue gouramis**

Q. I have a pair of blue gouramis. Both are about 4 inches in length. They are the last survivors from a spawning I had two years ago, and have never been separated. Recently I decided to try for another generation. The pair was conditioned and put into a 10-gallon tank with an undergravel filter and water spritz for plants. To my surprise the male was not aggressive and allowed the

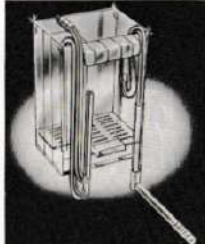
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By Paul Hahnel

### Crossbreeding vs. inbreeding

I raise veiltail guppies and came up with something unusual. I took a male Hahnel guppy and crossbred it with a female blue delta guppy. The results were successful. In these broods there were about 35 babies. Some of the babies were white on the bottom and the rest of the body gray. I would appreciate it if you could answer these questions:

Q. 1. After each crossbreeding will the babies get smaller and not grow to a large size?

2. What should I feed them besides very fine dry food, frozen baby brine shrimp and frozen daphnia?

3. Do the baby guppies have to be sexed so the males will have large veiltails and lots of color?

Tim Verity, Palos Heights, Ill.  
A. Guppy babies are always white and gray and colors do not appear until later months.

1. Crossbreeding will not make the fish smaller, but I think you mean inbreeding. Inbreeding for many generations will result in a smaller sized guppy.

2. Try not to feed extremely fine food, as baby guppies will not eat it and the smothered food will pollute the water. There is a great variety of frozen foods

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female to help build the nest. Even after spawning, both fish cared for the eggs side by side. I thought this was unusual

so for experimental purposes I left the pair in the tank for 48 hours after the fry had hatched. Neither parent made any attempt to eat their young. Two days after I removed the pair they regained their deep blue breeding color and began an act of "kissing" similar to that of the kissing gourami. I believe the actions of this pair is out of the ordinary. Do you have any comment on this? Can you explain their strange behavior?

Robert E. Steiner, Jamaica, N.Y.

A. The only comment I could make is that you did everything properly and used a pair of fish that were well acquainted with each other. Their behavior is not strange, merely a normal spawning by healthy fish under good conditions.

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on the market as well as many different kinds of proper sized dry foods. If live foods are available in your neighborhood perhaps like babyfish worms, baby and adult brine shrimp, or white worms, add them to the diet of your guppies.

2. The usual procedure is to separate the sexes and use only the best ones for further breeding. Size and color depend on the parents and on the conditions and food you are able to give the guppies you raise.

### Tank capacity

Q. 1. How many females and how many males can I have in a 10-gallon tank?

2. How long after they are born can you put guppy babies in a big aquarium with the other guppies?

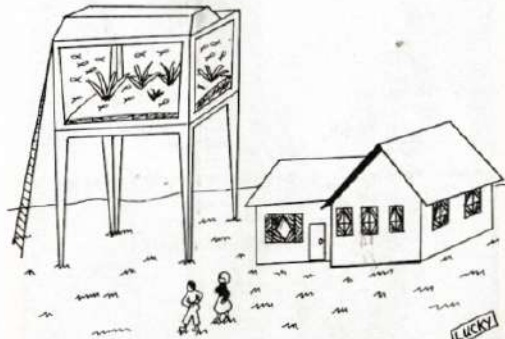
3. I have been waiting 2 to 5 weeks after the guppies are born to put them in the larger tank, yet I'll find a dead guppy about once a week after trans-

ferring them to the large tank. What is happening?

David Rupert, Kensington, Md.

A. 1. People say 1 inch of fish to 1 gallon of water. I recommend 4 males and 10 females for your 10-gallon tank. However, if you use gravel and the water level does not reach the very top of your tank, you may have only 6 gallons of water. If you know enough about your fish to give them the very best conditions, you can double the amount of fish in your aquarium.

2 & 3. There is no set rule. Two-week-old babies should be strong enough to be transferred to a different tank, providing the water conditions in this tank are very close to those in the tank where they were born. If the water differs too much all or some of the babies may die and this may be why you are losing a few after each transfer.



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## Salts From The Seven Seas



By Alfred A. Schultz

Q. I have raised freshwater tropical fish for 2 years but recently I have become greatly interested in keeping marine fishes. I live within walking distance of a beach where I find all the marine fish I can use including clown fish, Moorish idol, blue tang, four-eyed butterfly fish, etc. I thought I would have no trouble raising them. I bought a 15-gallon stainless-steel-framed tank and coated the inside seams with asphaltum varnish and installed a good outside filter as well as an undergravel filter. I took pains to avoid contacts with metal when I transported sea water from the ocean and I waited 2 weeks before I put the fishes into the tank. The water in the tank was crystal clear after it had been filtered for 2 weeks. I put six 1-inch fishes into the tank. They spent their first week in the tank quite well. In about 10 days, I discovered that all the fishes were staying in the top half of the tank and their respiration rate was much higher than usual. Soon afterwards they died one after the other. The hydrometer reads 1.025 and the thermometer reads 75° F. There is no sand, gravel or plants in the tank. I only put a piece of disinfected coral atop the undergravel filter. I have read the book "Salt-

Water Aquarium Fish" (old edition) so many times that I can almost recite it, and have ordered the new edition of this fine book written by Dr. H. R. Axelrod and William Vorderwinkler, hoping it will give me more information and encouragement. I have the following questions:

1. Can you tell what I have neglected or should have tried, after reading my account?
2. Since sea water contains microscopic life which we take pains to filter out, would it be safe to use a commercially prepared salt instead of sea water to keep marine fish? Which is better?
3. Is a plastic tank an absolute necessity in raising marine fish? Can I use stainless steel tanks with the inside corners coated with rustproof red primer and asphaltum varnish?

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4. Is a pH tester a necessity?
5. Can I use a gounfish as a scavenger in a marine aquarium?
6. How can I tell if the fishes die of water pollution or overcrowding?

Philip Huang,  
Okinawa, Ryukyu Islands.

- A. 1. I would have changed the water at the first sign of trouble.  
2. I prefer to use artificial salts at all times.  
3. No, a plastic tank is not necessary, and you can use a stainless steel tank, but not with a primer. Apply the asphaltum varnish when the surfaces are thoroughly dry.  
4. Not an absolute necessity, but it's a good idea to have one.  
5. Yes.  
6. Water pollution can be seen by a discoloration on the body of the fish. It is a sign that the tank is overcrowded if the fish gasp near the surface.

Q. 1. Would I be able to keep clown fish with *Actinia equina*, a species of anemone?  
2. Would I be able to keep a pair of beau gregories with clown fish and anemones?  
Douglas Strange, Harrisburg, Pa.

A. 1. Yes; although clown fish and *Actinia equina* come from different parts

of the world, they have been found to get along well together.

2. No; sooner or later the beau gregories would come in contact with the tentacles of the anemone and be severely injured or killed.

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This is one of several color variations of the King Cobra Guppy developed at Mac Guppy Hatchery. Note the clear snake-skin body markings and black-spotted veil tail. Photo by Dr. Herbert R. Axelrod.

The story behind . . .

## The King Cobra Guppy

BY MIKE REED

Another prize-winning strain of Guppies can now be added to the credit of the talented owners of Mac Guppy Hatchery in Long Island City, New York. These men, Mac Kalichstein and his partner Jano Cardillo, have named the gorgeous new veil-tail the King Cobra. Mac's wife Paula explains it this way . . . "The fish earned its title, for it is truly a 'king' in color and beauty. The 'cobra' part comes from the snake-skin markings that cover the entire body. These markings have been developed to show through our beautiful blue, green, red, or yellow strains. The resulting Guppy is really a hobbyist's delight." The accompanying photos should convince you that Mrs. Kalichstein's enthusiasm is justified.

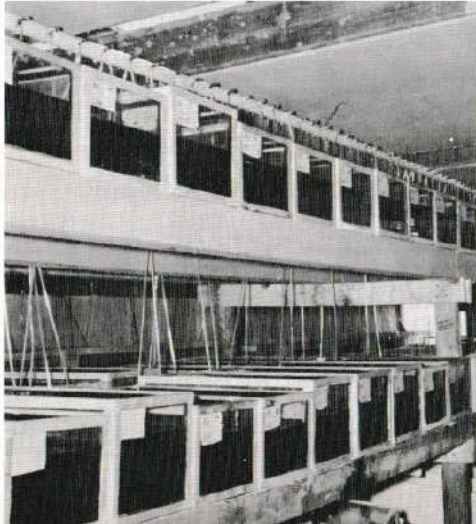
The strain began with a three-quarter black male with unusual markings. This fish was brought into the United States from Europe by the well

Tropical Fish Hobbyist

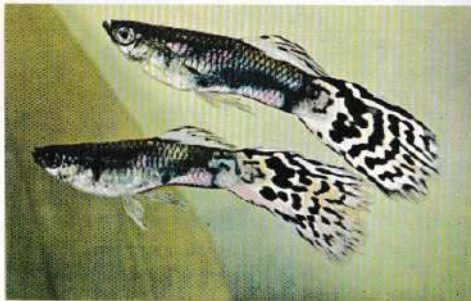
known Mr. Paul Hahnel. Mr. Hahnel presented the male to another Guppy enthusiast, Mr. Fred Reitz. After working awhile with the fish and partially developing some of its potential, Mr. Reitz gave some of his stock to his friends at the Mac Guppy Hatchery. The rest of the story should be of particular interest to the many amateur Guppy breeders who constantly seek information on how to develop or maintain a strain of fancy Guppies.

Fifty-five tanks were allotted to the new project. The finest of the new males were crossed with many virgin females of various fixed strains. Tanks were marked and watched and careful records were kept which showed which strains of females gave the best results. More crosses, always using the best specimens, constantly produced increasingly better markings, color, and size. After many crosses made over a period of 18 months, the strain was developed to the point shown in the accompanying photographs.

Many tanks must be used to establish a new strain such as the King Cobra. Note stickers on corners of tanks for recording pertinent data. Photo by Dr. Herbert R. Axelrod.



Tropical Fish Hobbyist



Guppies somewhat similar to the King Cobra strain have been developed in the past. The two above (Photo by Dr. Herbert R. Axelrod) have snake-skin patterning in their tails but not in their bodies. The one below (Photo by Dr. Edward Schmidt) is marked much like the King Cobra but does not have its broad veil tail.



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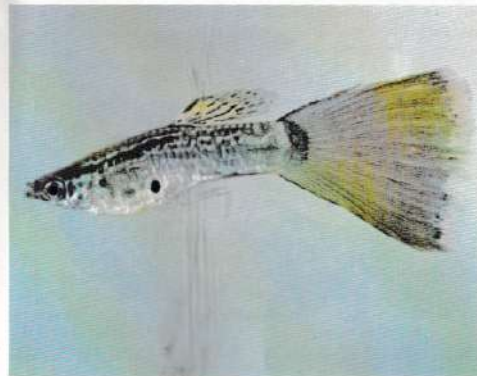


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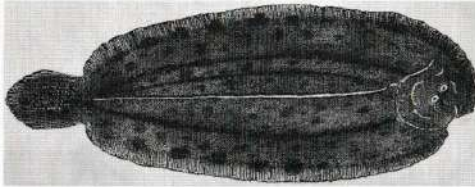
This King Cobra Guppy male is more subtly marked than the one shown at the beginning of the article. Photo by Dr. Herbert R. Axelrod.

Feeding at the Hatchery is standardized at five times per day; foods include newly hatched brine shrimp, powdered food, liver paste, beef heart, and, occasionally, well cleaned worms. All tanks are kept spotlessly clean through the use of regularly changed filters and catfish as scavengers.

Water is kept at about 76 F., and the temperature is never allowed to drop or rise suddenly. The pH is kept at the level of the tap water supplied by the city, slightly basic. Readings are not taken regularly, for there are 350 tanks at the Hatchery. Constant pH is assured, however, by both the extreme cleanliness of the water and by weekly changes of at least one gallon of water for each tank. To carry out this program, a minimum of 500 gallons of aged water at the proper temperature is always kept on hand.

No more than two Guppies per gallon of water are ever kept in any tank. This not only assures maximum health and growth but also reduces greatly the possibilities of tail damage.

The owners of Mac Guppy Hatchery started as hobbyists, just as you and I did. The difference is that they not only know all the rules of proper care but also follow them *scrupulously*. Do the rules work? Mac can show you any number of trophies and prizes to prove that they do. And you know the old saying—"You can't argue with success!"



A specimen of *Achiroipsis nattereri* Steindachner captured near Iquitos (Amazonia peruana) in 1959. Drawing by Dr. K. H. Lulling.

Biologically, the Soles are very interesting from two points of view. For one thing, the bodies of young specimens undergo a complete re-organization when going to the ground. Secondly, there very often is a remarkably prompt ability to change their colors and patterns according to various kinds of bottoms.

Larval Soles show the same body structures as those of other fishes. Their backs are always upwards. Developing ground-life abilities, the fish "fall onto one side," right or left, depending on the genus. This side then becomes the physiological lower part, held downwards also when the fish is in motion. During this process, one eye gradually moves to the opposite side of the body, which in turn now becomes the upper part.

Many fishes, through special mechanisms, are able to vary their coloration according to the shades and colors of their environments. "Psychic" impulses with fishes are also accompanied by marked changes in coloration. The aquarist knows about the "sleeping garment" of some fishes; he also knows that changes of color may be observed when he is about to net his fishes. But a great many Soles can do more than only change their shades and hues. They are also sometimes capable of exactly assuming the structure of the ground.

When I recently visited the Aquarium of London Zoo, I saw one large public aquarium tank whose bottom had been divided into two differently colored parts. The patterns of both parts were also different. The visitor got a strong impression of how the very patterns of various Soles in this aquarium changed according to the structures beneath them.

In all chromatophores (color-producing cells), the pigment (coloring matter), conducted by plasmic structures, can switch the state of spreading in the cell-extensions to a state of accumulation around the center of the chromatophores, and vice versa. This process may take place with variable

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