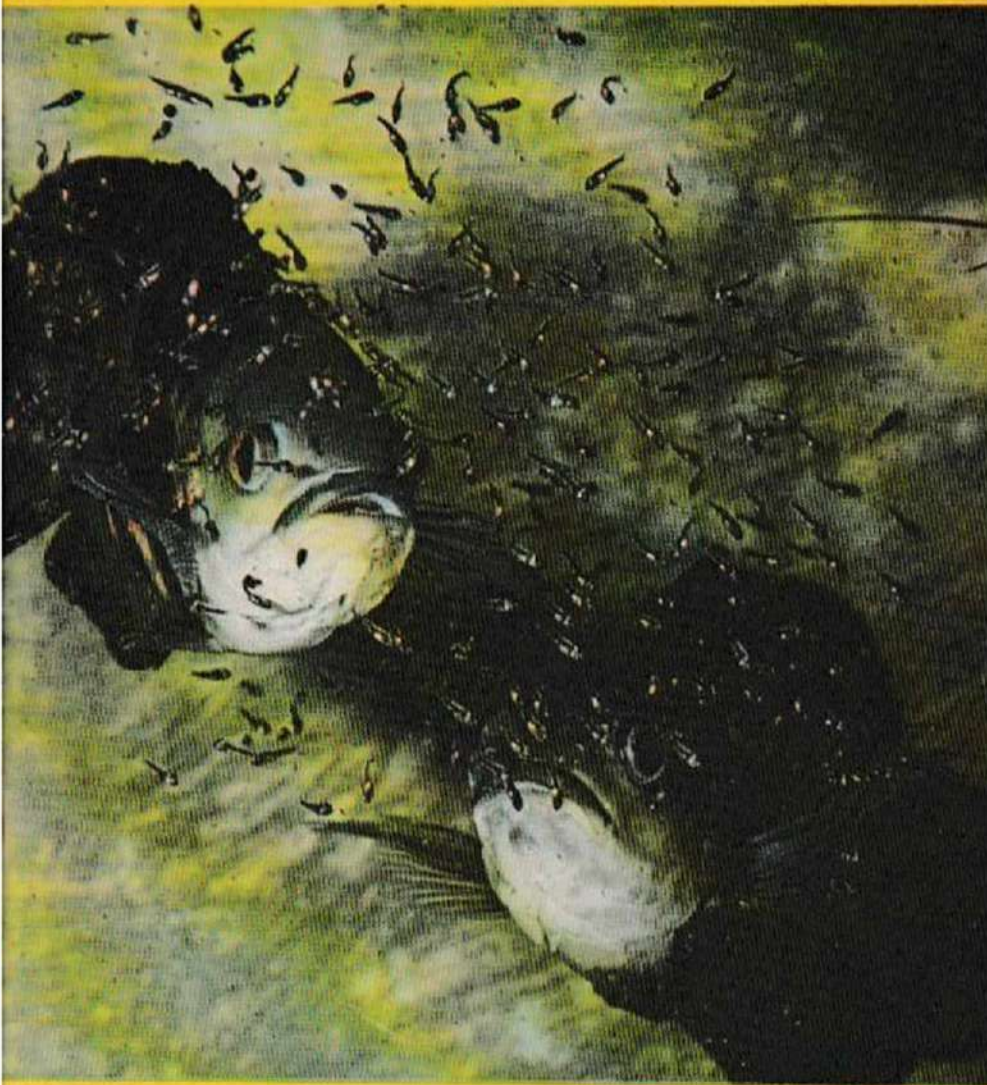


November, 1969

tropical fish hobbyist

DOMESTIC 50¢



Personality Plus

SEE PAGE 4

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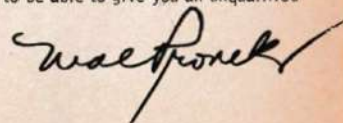
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editorial

First the bad news. If you're not a subscriber, you will have noticed that the price of TROPICAL FISH HOBBYIST has gone up a dime, from 40¢ to 50¢ per copy. We could go on and on explaining exactly why the price of the magazine has risen, but I don't think it's necessary. You live in the world, and you're not insulated from what has been happening on the economic front here and just about everywhere else you might care to mention. Prices are going up, up, up. For our part, we're going to make sure that every single issue that you receive is going to constitute good value received for money spent; we have exciting new features on tap, and we're certain you'll enjoy and profit from them. So TROPICAL FISH HOBBYIST will remain a bargain regardless of its new cost . . . we promise. In the meantime, why not take advantage of that wonderful built-in hedge against inflation that we offer in the form of a one-year, two-year, and even five-year subscription? Buy a subscription today and let us do the worrying about the inflationary spiral.

Now the good news. It's this: our work on EXOTIC MARINE FISHES is proceeding smoothly, and we expect to have this masterwork of exciting information and equally exciting color photographs published well before Christmas. So for all of you who've written to us wanting to know whether you'll be able to obtain copies for gifts at Christmas this year, we're happy to be able to give you an unqualified YES.



cover

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Pride may goeth before a fall, but it also cometh after a success, so proud the parents and prouder yet the owner of the swarm of baby oscars pictured on our cover this month. Headstrong, cantankerous, gluttonous, temperamental the oscar is, but also intelligent, fascinating, personable and charming is the oscar, definitely the most sought after of all the big cichlids that ever frustrated aquarists' attempts at fraternization. Learn exactly why it is that hobbyists have come to appreciate a fish that knocks heads with them every day of its life. Cover photo by E. A. Baumbach.

exotic tropical fishes supplements

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

rates

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Personality Plus:

The

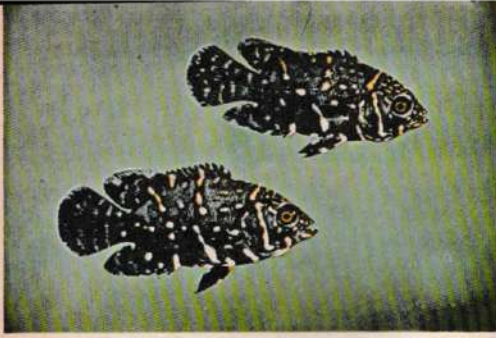
Oscar

BY FREDERICK J. KEER

Never has a fish with so many disadvantages been as popular as the oscar. A full grown pair requires a 50-gallon aquarium, will eat anything smaller than a medium-sized tuna, uproot any plant smaller than a tree, push rocks around the aquarium, move gravel from one end of the tank to the other, splash water on the carpet and bite the hand that feeds them. How does such a bundle of obnoxiousness become so popular?

Any aquarist who has encountered an aquarium full of tail-wagging baby oscars knows they are cute. In the smaller sizes, they are among the most unusually colored of tropical fishes. The basic color is a velvety dark brown variously interrupted by broken lines and dots of ivory white. The pattern is unlike that of any other cichlid. But although their color alone is enough to sell baby oscars, their personality is what moves them out of dealers' tanks. They are curious creatures and rush to the front of the aquarium every time someone approaches; the rush is accompanied by vigorous tail-wagging and eye-rolling. It's enough to loosen the purse strings of all but the most hardened cases.

As the oscar grows older, the ivory pattern on the fins tends to disappear, and those on the body tend to enlarge. In fully developed specimens the general effect is a fish with the upper half of the body velvet brown with the lower half pale, ranging from ivory white to bright orange. The conspicuous spot mentioned in the scientific name, *Astronotus ocellatus*, becomes apparent when the fish is about three inches long. Only as the fish becomes older, however, is it circled by a bright red line. The oscar is indeed a handsome fish, but how many aquarists would be willing to cater to a fish like this when with much less work he could maintain fishes which are more colorful? The answer, of course, is that the oscar is not kept for color alone. The important thing, again, is personality. The vast majority of oscars are purchased when they are in the inch to two inch range by unsuspecting



Infant oscars like the two shown here differ greatly from adults in color pattern, but not very much in behavior. Hobbyists who are inclined to turn over a large tank to five or six babies like these and let them grow up in it can derive real delight from the antics of their big cichlid pets. Photo by Harald Schultz.

aquarists. By the time the oscar starts to get large and the bad points start to show up, the aquarist is often so attached to the fish that he is willing to go to considerable trouble and expense to accommodate it. Oscars really are more to their keepers than other fishes. They almost reach the status of a pet cat or dog, which is something few other cold-blooded pets ever attain.

Personality plus, that's the oscar. If he doesn't like the aquarium background you provide, he will refuse to leave his position against the front glass of the aquarium. If you decide to plant his aquarium with five or six swordplants, he might uproot all but one, no matter how many times you replant. If one of your visitors wears a hat of which the oscar does not approve, he may go behind a rock and refuse to come out for days. On the other hand, the oscar will take an active interest in the life of your family. When you're hanging pictures, the oscar will be at the front of the aquarium looking over your shoulder. He will take an inordinate interest in your attempts to smooth the landscape in his aquarium, and in a few hours will make it clear that he prefers moon craters to flat plains. And the oscar can be trained.

An oscar soon learns to associate people with food and even seems to develop the ability to recognize the person who does the feeding, splashing water with a little additional enthusiasm when he sees him. An oscar can easily be taught to jump out of the water for food. The aquarist starts the training procedure by holding a sizable chunk of food just below the surface of the water. Practice will soon teach the aquarist how to hold the food so

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Adult oscars are very interesting display fish, combining subdued but pleasing color contrasts with their active, curiosity-provoking actions. The ocellus at the caudal peduncle is responsible for the ocellatus part of the species' scientific name and also for the occasionally used popular name of peacock cichlid. Photo by Hansen.

that his finger will not be cut by the fish's small, but very sharp, teeth. When the oscar has mastered the trick of taking food from the fingers underwater, the aquarist should start holding the food just out of the water. By gradually increasing the height from the water, the fish can be taught to jump completely out of the water. Oscars also develop the desire to be stroked by the hand of the aquarist. This usually starts with the aquarist pushing the inquisitive beast out of the way while working in the aquarium.

The aquarist who is planning to purchase one or more oscars should be realistic about the aquarium requirements of this fish. The oscar is not a community tank fish, at least not in the generally accepted meaning of the term. Although baby oscars might be an addition to the community aquarium for a few weeks, they quickly become large. When they become large, they bully all the fish that are too large to swallow. Tank size for the oscar is a big problem. Although individual oscars are sometimes kept in aquariums as small as 10 gallons, this seems a cruel practice. To be at its best, a full-grown oscar (about 12 inches long) needs a 20-gallon aquarium to itself. A pair does well in a 50-gallon tank.

The aquarium for an adult oscar must have several additional features. It should have a power filter to clear the water of the sediments stirred up by the oscar's digging. The aquarium should also be provided with a weighted cover, because *A. ocellatus* is prone to jumping at times. Unfortunately the average aquarium cover is not heavy enough to withstand the force of a jumping oscar. A brick gives just about the right weight.

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Tropical Fish Hobbyist

Food becomes an unexpected problem for oscar fanciers. The baby which so enthusiastically ate a dab of frozen brine shrimp soon grows to be a monster that will send his owner to financial ruin if the diet is continued. Fortunately, inexpensive food is available in the form of hamburger, dog food, snails, live fish and earthworms. Some individuals are especially fond of raw liver.

Food is a problem for two more reasons. The first is water pollution and the second is indigestion for the fish. An adult oscar can consume a huge amount of food and, as a result, produce a huge amount of waste, which makes a power filter highly desirable. It is also good practice to siphon off waste and uneaten foods after each feeding.

Gluttony is very much a part of the oscar's personality. He simply will not quit eating if there is food available, and his over-indulgence results in a colossal bellyache for the aquarist as well as the fish. The oscar may start swimming erratically or hug the top or bottom rolling his eyes. When this happens, one tablespoon of epsom salts per ten gallons of water is sometimes helpful.

Another ailment of the oscar is that it sometimes goes into periods of panic in which the slightest disturbance will send the fish dashing about the aquarium like an aquatic nut. The best cure seems to be covering the tank for a few days with a blanket and withholding food.

Oscars are more often bred accidentally than otherwise. Pairs are difficult to distinguish; several aquarists who have resigned themselves to the idea that they had two of a kind have been surprised when presented with a clutch of fertile eggs. Males tend to be more colorful and aggressive, but this is not always the case.

True love usually runs a rough course with oscars. There is generally a great deal of jaw-locking and body-slapping. If one mate becomes too enthusiastic and damages the other, it may be necessary to put a partition in the aquarium to separate the combatants for several days or weeks. If there is gravel in the aquarium with the breeding pair, it will be moved with great energy and excavated into pits and mounds. The pair may spawn directly on the bottom or on a large stone. Oscars are good parents, and artificial hatching is seldom necessary. The fry will accept newly hatched brine shrimp upon becoming free-swimming.

The oscar is found in the Amazon river and parts of Florida. Naturally it is not native to the United States, but it was introduced into the waters of Florida by an aquarium dealer who was going out of business. From the original hundred fish has developed a population of such a size that the Oscar is now considered to be a game fish in that state. It is reported to be an excellent fish for eating. So, if your oscar finally tries your patience and your pocketbook to the limit, take one cup of flour and add a pinch of salt. . .

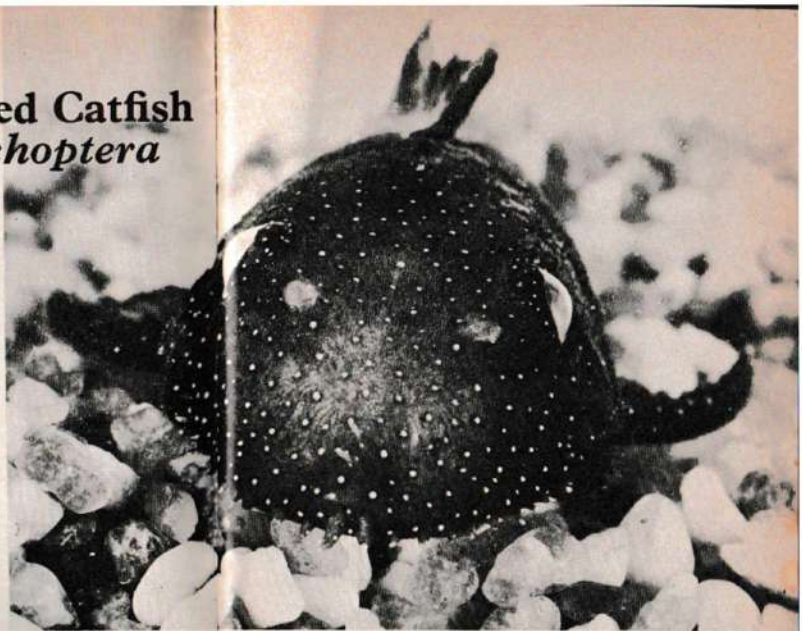
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Hungry is the word for oscars big or small, and *A. ocellatus* specimens respond even better than most other aquarium fishes to the prospect of getting a meal. These three almost-adult oscars were raised by their English owner to the size at which they are pictured on chopped garden worms, snails and water beetles, but it is not strictly necessary to provide a diet of live foods to grow good oscars. Photo by Laurence Perkins.

The Blue Armored Catfish *Xenocara dolichopectera*

The grotesquerie of its head somewhat exaggerated by this head-on view, this young male *Xenocara dolichopectera* exhibits the beginnings of the bristly appendages that will cover its entire head when it matures.
Photo by Dr. Herbert R. Axelrod.



BY FRED BEIER, GERMANY

In my forty inch long South American tank I keep a few species of the genus *Corydoras*. So far I have succeeded in breeding *Corydoras paleatus*, *C. hastatus*, and *Loricaria filamentosa*.

Two-and-a-half years ago, at a wholesaler's shop, I saw some young catfish, 1½ inches long, which at first I thought were some species pertaining to the genus *Otocinclus*. Arriving at home, I placed them in my South American tank where they lived together with the *Corydoras*, some blue *Xiphophorus variatus*, some blood-red *Xiphophorus maculatus*, and some *Heterandria formosa*. They spent the next eighteen months growing up. After this time the females measured 2½ inches, the males 3½ inches. They would eat everything I offered them, tubifex worms with special relish, and also lettuce which was kept down at the bottom with a piece of lead sheet.

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The temperature was constantly kept at 75° F.

After the male was clearly identifiable by his antennae, I placed him together with two females in a 24 inch tank without covering on the bottom and only a few plants planted in ceramic dishes. As spawning substratum I set up a few pieces of slate, stood up at an angle. During the next half year the most diversified tricks were used in order to induce the fish to spawn: daily changes of water—often up to half the whole contents of the tank, raising and respectively lowering the temperature, and so on. Despite the fact that the females showed strong signs of being full of roe, no spawning was to be noticed. Finally, I gave up hope and placed 50 blue *Xiphophorus variatus* into the tank in order to have them develop colors.

Then I had another idea for creating a spawning possibility. A piece of

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Tropical Fish Hobbyist



The mouth of the blue armored catfish is a very efficient mechanism for removing algae from the aquarium glass and decorations, including plants. In this regard *X. dolichopectera* and other members of the family Loricariidae make good cleaners for a tank that grows a lot of algae... but prospective owners should keep in mind that some of the sucker catfishes from South America get very large and need big tanks.
Photo by Peter Chlupaty.

Under conditions that are to their liking, some of the armored catfishes are comparatively easy to spawn, and they make good parents. Photo by the author.



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November, 1969



Fully grown male *X. dolichopectera* are easily differentiated from the females because they are larger and have the full set of head bristles. With younger specimens, however, sexing is not easy. Photo by the author.

the bark of a cork oak about three inches wide and eight inches long was stuck across the tank so that it formed a cave about two inches above the bottom. Eight days later I could not believe my eyes! A lot of *variatus* were picking at a ball of roe the size of a pingpong ball. The eggs were strongly adhesive to each other, and the *variatus* did not succeed in prying off even one single egg. Meanwhile the male *Xenocara* was lying under the cork bark. I immediately removed the spawn and the male and transferred them to a 1½ gallon whole glass tank without bottom covering but with aeration. The eggs were the color of egg yolk. The male did not let the transfer ruffle his calm. He immediately resumed fanning the eggs.

After two days, I noticed another ball of spawn under the piece of bark in the breeding tank, which still contained the *variatus*. Could I have missed it at first? Or had the male spawned with both females? This spawn was transferred to another whole glass tank, obviously without any male, since the one I had was already taking care of the first batch of roe. In order to make up for his absence I placed a small-bubbled air stone near the eggs.

In the first tank, the first young catfish hatched after seven days, under the care of their father. They showed a large yolk sac, but after another two days this had been completely consumed. In the tank without male, one-third of the spawn became fungused. The remaining eggs also hatched after eight days. The freshly hatched young measured one-quarter of an inch.

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Tropical Fish Hobbyist

After the yolk sac had been used up, the first food I served were algae-covered rotting leaves, which I had gotten from a near-by pond. After another three days, I offered three daily helpings of a commercial fry food. Soft thread algae too were served and eaten eagerly. The leaves were nibbled down to their nervures. From the sixth day on, the fish were fed additionally on a commercially prepared dry food which is pressed into tablets and contains a large percentage of vegetable contents. On the tenth day, the first chopped micro worms were taken, and after the fourteenth day I was able to feed whole micro worms as well as finely sifted cyclops.

Both spawnings yielded a total of 96 young catfish. Two of these died on the third day. After eighteen days the remaining had grown $\frac{1}{2}$ inches long. About 10 percent of the fish were of retarded growth, while the others developed normally and steadily.

In the hatching tanks were small internal filters packed with gravel. The catfish fry relished "grazing" off the algae and micro-organisms from these surfaces. After four weeks both hatchings were distributed over several tanks that contained plants and gravel.

After this experience, which also goes for *Loricaria filamentosum*, one should pay attention to the following important points when trying to breed these species:

- 1.—The age of the breeders must be at least 2 to 2½ years.
- 2.—Offer them all kinds and shapes of spawning possibilities.
- 3.—Use vegetable food (detritus, tender thread algae, etc.) for rearing the young.
- 4.—Provide for cleanliness in the nursery tank (use internal filters and renew half of the water every third day).

After the demands posed for breeding by a freshly imported species of fish have been discovered, procreation ceases to be a "problem." This is what happened with the Blue Armored Catfish.

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November, 1969

Imported Diseases

BY DR. GOTTFRIED SCHUBERT

Photos by the author

Fish are not free of parasites just because they were swimming in their native habitat a short time ago. Fish bred in Hong Kong or Singapore (they are sold as "imports," too) may have diseases not found in the USA.

Is this a real danger?

A short while ago *Pterophyllum scalare* brought an unwelcome guest with it, a hair-worm, *Capillaria pterophylli*. This parasite lives in the midgut of the angelfish. The females reach a length of about 2 cm but are only 0.07 mm in diameter. Males are much smaller. If you have good eyes you may sometimes see such a worm hanging like a fine thread out of the anus of the fish. The females lay eggs which, together with the feces, sink to the bottom and are eaten by other fish, which in turn will harbor these worms. Those who own a microscope will easily detect the eggs in fresh feces. They have a very peculiar shape and it is nearly impossible to mistake them for something else.

Today a high percentage of all angelfish in our tanks are infected with hair-worms. But other fish may get these worms, too. Especially endangered are, of course, all fishes which take their food from the bottom, as such fishes easily swallow worm eggs. Therefore the different species of *Corydoras* are frequently found infected. Fishes that live in the middle zone of our tanks, like tetras, rarely show *Capillaria* infection. Those snatching their prey from the surface of the water are never infected.

A few hair-worms in a fish usually don't matter much, but if there are thousands of them they may kill their host. This occurs rarely, so *Capillaria* is mostly unknown to hobbyists. But we ought to watch the future, because the different species of the genus *Symphysodon* (discus) seem to be very sensitive to hair-worms. *Symphysodon* kept in the same tank with angelfish are nearly always infected. In freshly imported *Symphysodon* I have never found *Capillaria*. *Symphysodon* reacts strongly to hair-worm infections, even if there are but a few worms. Another disease found in a high percentage of all *Symphysodon* turns worse by a simultaneous worm infection. A small flagellate with the Latin name *Spiromucleus* is present in all *Symphysodon* living in their natural habitat. Usually this parasite occurs in small numbers only and does little harm. But under the less than optimal conditions of captivity the flagellates multiply enormously, and soon there are millions and millions of them. They primarily live in the gut but may spread to other organs. This wandering is advantageous to *Capillaria*. The worms are inclined to puncture the intestinal wall and thus open pathways for *Spiromucleus*. An infection of the kidney by *Spiromucleus* means death to *Symphysodon*.



Plate 1. Eggs of the hair-worm *Capillaria pterophylli*.

A parasite mostly unknown to hobbyists but present in many tanks (both freshwater and marine, fresh- and sea-water) is the gill worm. It isn't quite correct to speak about *the* gill worm, for there are a lot of different species. We have found 37 of them in the last few years. Some may have come into our tanks with live food, but some have doubtlessly slipped in with imported fish.

We in Europe have suffered infections with *Ichthyophthirius* (ich) in the last years which didn't respond to the usual treatment. We are not sure, but it seems possible that new tropical diseases may have invaded our tanks.

If recognized in time the spreading of a new disease can be prevented. Let me give you an example. Imported *Ctenopoma kingsleyae* showed spots on their fins. The owners suspected ich, and if you look at plates 2 and 3 you'll agree that the general appearance supported this assumption, but usual treatment for ich didn't show any effect on the spots. Closer investigation under the microscope revealed that the spots were motionless and therefore couldn't be ich (*Ichthyophthirius* is constantly turning around). Also, the typical horseshoe-shaped nucleus was missing. When we pressed the white nodule until it burst, millions of tiny spores of a sporozoan were to be seen. The parasite proved to be unknown to science. It was later named *Henneguya pinnae*. If the fish had been allowed to die in the tank or to live until the nodules would have burst by themselves, other fish,

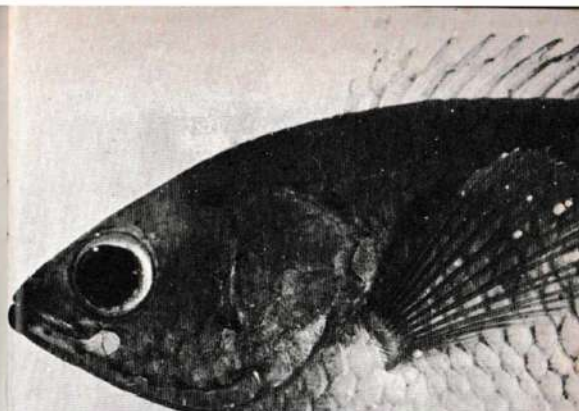


Plate 2. *Ctenopoma kingsleyae* with white spots on the fins.

Plate 3. The fins at close range. The spots look like "ich" but aren't.

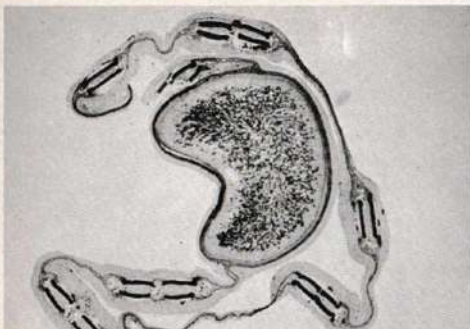
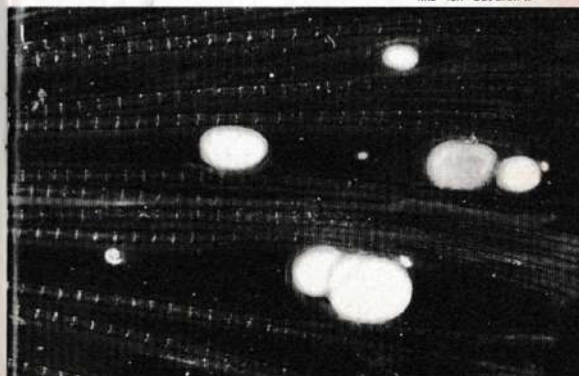


Plate 4. A microscopic section through a white nodule of plate 2 and 3. The tiny black dots are spores of a sporozoan.

especially anabantids, could have been infected. We have also learned that imports from West Africa often are infected by sporozoa.

Certain parasites are harmless in our tanks. If I dissect a *Symphysodon* I can tell whether the fish was bred in captivity or caught in its native river. All wild *Symphysodon* have larvae of flukes in their organs, but these parasites cannot infect our tanks. The fish is but an intermediate host for the fluke. The adult parasite lives in a fish-eating animal (bird, crocodile, bigger fish). In tanks there is no chance for the fluke to find its final host and become an adult animal.

How could we prevent importing diseases together with our fish? I see two ways: we can appeal to the dealers. They usually don't import single fish but quite a number of a given species at any one time. It seems possible to dissect and check, let us say, one out of a hundred. If it proves necessary the fish must be treated or even destroyed. But since this involves loss of money, I am not very hopeful about it. The other possibility seems more favorable. The breeders among us could take care of it. In many instances it is possible to breed healthy offspring from diseased parents. A little knowledge of the diseases the fish suffer from is necessary to achieve this. Since many hobbyists have turned into veritable chemists and engineers in order to have fine fish in their tanks, why shouldn't they become amateur veterinarians, too?

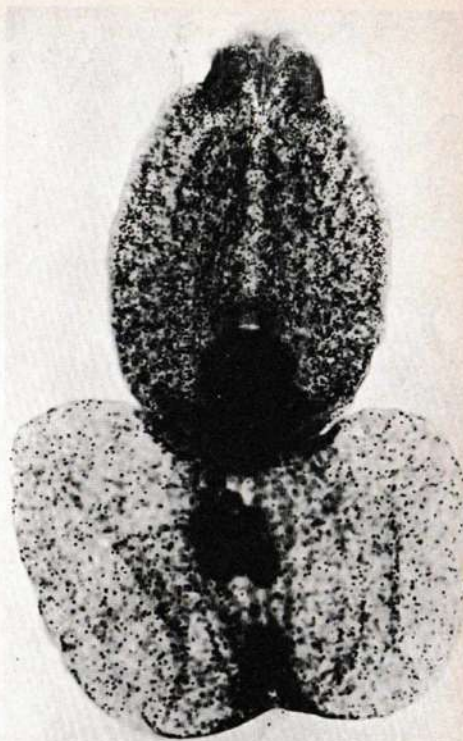


Plate 5. Larva of a fluke found in an imported *Symphysodon*. Such parasites are never found in tank-bred fish.



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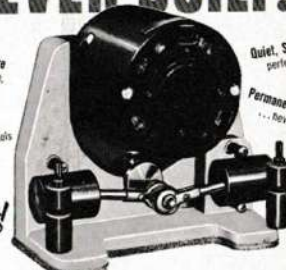
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Sometime between joining a society of tropical fish fans and the testimonial dinner given for 60 years of outstanding service, a hobbyist may expect to be elected or appointed to the post of Publicity Director. This questionable honor is a bit confusing at first, and by the time he attempts to write his first press release or draw the fifth

meeting is important! But so is the meeting date and program of dozens of other clubs in the reading or listening area. As PR, (press representative, in news lingo) you are in competition with other hobby groups, garden clubs, political organizations, and the news of the day. And no one knows this better than the people who work in the

How to Get PUBLICITY For Your Fish Club

By Dudley Campbell

poster, a feeling of panic usually grips him somewhere in the neighborhood of the dorsal fin. The feeling is well known to those who have tried to write a story for the local newspaper the weekend before the next meeting. Needless to say, some get published—most don't.

Publicity is not as tough a job as many people think it is. It is, simply, getting all the facts to the news media on time. The key word is TIME. Bear in mind that no editor, broadcaster, or reporter can, or will, accept a release that pushes him for time. Sure, your club

news services. All news is perishable; it has been said that over-ripe tomatoes will move faster than yesterday's news. Recognizing this fact and establishing a program to meet the "deadlines" of the news media will not only get the job done with the least amount of stress but will also endear the PR agent to the club and the editors.

To know how to get the publicity, it is better to first explain *what is publicity?* The meeting of your club is NEWS. No other word can describe the importance of the event.

The level of interest generated by a publicity announcement is usually determined by *how* the news is presented. This is where the club's press agent comes in.

"Who wants to know?" you might ask yourself. Well, the fact that people can out-curious the proverbial cat has made a mighty empire of the news services. A lot of people who don't know a *Corydoras* from a cardiac will show up at a gathering if they are tempted by an interesting write-up.

How to write the press release: Here we run into all sorts of questions. Spending hours trying to glamorize the mediocre meeting would probably do more harm than good. Writing a five-page history of the club every month would have the same effect. The best approach is to "blurb" (short paragraph or two) the average monthly get-together; "plug" (longer paragraphs, 6 or 7, maybe a photo or two) the better meetings; and "full coverage" (the works, stories, photos, interviews, all media) the special events. To get an idea of the material that would be most ac-

ceptable, examine the format of the media that you intend to approach. Newspapers can use newsworthy material of all lengths, human interest stories, features, general announcements, photographs in black and white and occasionally even in color, etc. Radio and television are more limited; radio can use only short (one to two minutes reading time) announcements and maybe, once in a while, an interview. Television is even more limited by the demands made on it by network shows. Unless your area has a community service program or special channel, the only time a TV station could be approached would be during a show or top news event.

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 Press Sec.—Dudley Campbell—037-0572 Contact

"Community Aquarium" To Be Shown Headline
 The popular slide-show, The Community Aquarium, will be shown at the June meeting of the Huntsville Aquarium Society 1
 2 7 P.M. Wednesday night at Brown Engineering. The show, which consists of 100 slides and commentary, was produced by the Society and has received acclaim from many civic groups and schools, as well as those in the aquatic hobby.
 In addition to the slide-lecture, there will be a competition of Angel fish and a short lecture on the breeding of Angels by Society President Manfred Segwitz. 4
 Hobbyists, interested in becoming members of the Huntsville Aquarium Society, may write c/o P.O. Box 5151, 35805, or call 037-0572 for more information. 5

Thank you for your consideration.

SUGGESTED FORM FOR PRE-MEETING RELEASE (FOR NEWSPAPERS)

1: Club requesting publicity; 2: date and time of meeting; 3: location of meeting; 4: program; 5: contact for information.

The basic lay-out of the standard press release should include the following information written in a clear, non-cluttered fashion: name of the organization; date, time, and place of meeting; subject of the program; name of any guest speaker or special guest. If a movie or slide-show is the main feature of the program, a short synopsis of the film may be included. In presenting

this information, the novice reporter should stick to plain, unvarnished facts. The re-write of the news will take care of the final make-up. As you gain more experience, you might try your hand at properly composing your article.

On the matter of illustrations, most editors will welcome a good tie-in picture to run alongside the announcement. As a matter of fact,

an excellent black and white photo can boost the allotted space and give your club even more status on the hobby page. Any size print will do, but better acceptance sizes are 8 x 10 and 5 x 7 glossies.

For radio announcements, the same information should be composed for fifteen to twenty seconds reading time. This sounds like a mighty short time, but it is about all the time that you may expect. Television is even more picky about

time and material. Check with your local station to see (1) if they will run your announcement, and (2) what material they need (slides, copy, etc.).

If you are ever lucky enough to be called on for a broadcast interview, collect enough material for a short discussion—anything from five to fifteen minutes is about average. Again, your contact at the station will advise you of the props that will be needed.

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Ed Gralewicz

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Tropical Fish Hobbyist

Often overlooked in the day-after-the-meeting collapse is the potential of a good follow-up story. Who won the bowl show? (picture of the winner accepting the ribbon, showing the winning fish, etc.). Generally, only the newspapers will show interest in this sort of release.

Now that you have a pretty general idea of how to write the news, it is time to talk about presenting the copy to that omnipotent being in his holy of holies—the

editor at the city desk. Few editors eat PR agents for breakfast—most have ulcers—so your best approach on your first foray into the whacky world of journalism is to call the city desk, explaining that you have a news release from your aquarium society and would like to know the best time to bring it in, and to whom you should deliver it. Nine times out of ten, it will go to a reporter whose job is to "sift the wheat from the chaff, then print

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION (Act of October 23, 1962; Section 4369, Title 39, United States Code)

- Date of Filing: September 10, 1969.
- Title of Publication: Tropical Fish Hobbyist.
- Frequency of Issue: monthly.
- Location of known office of publication: 245 Cornelison Avenue, Jersey City, New Jersey 07302.
- Location of the headquarters or general business offices of the publisher: 245 Cornelison Avenue, Jersey City, New Jersey 07302.
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- Owner: Miracle Pet Products, Inc., 245 Cornelison Avenue, Jersey City, New Jersey 07302; Dr. Herbert H. Axelrod, Pres., 245 Cornelison Avenue, Jersey City, New Jersey 07302.
- Known bondholders, mortgages, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities: none.
- Paragraphs 7 and 8 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the names of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs above the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 7 and 8 when the interests of such individuals are equivalent to 1 percent or more of the total amount of the stock or securities of the publishing corporation.

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest To Filing Date
10A. Total No. Copies Printed (Net Press Run)	50,000	50,000
B. Paid Circulation		
1. Sales through dealers, agents, etc.	32,794	23,418
2. To term subscribers by mail, carrier delivery or by other means	19,448	19,681
C. Total paid circulation	42,242	43,099
D. Free distribution	3,435	3,490
E. Total distribution	45,677	46,589
F. Office use, left-over, unaccounted, spoiled after printing	4,323	3,405
G. Total (sum of E and F)	50,000	50,000

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the chaff." Call this reporter, briefly explain your situation, and arrange an appointment. This is not necessary if you are familiar with the deadline times. Each morning, (or evening, depending on when they go to press) there is a mad rush to put the paper together. Within an hour or two, all the news of the moment must be written, double-checked, composed into type, and sent to the printers. Now you can appreciate the necessity of appearing in the office during the slack periods. If any questions are raised about your copy, you will have plenty of time to discuss the material. Once you have submitted two or three notices, you should have a general knowledge of the deadlines.

Rules you must follow if you want to stay on good terms with the media:

- (1) Never be late turning in a meeting notice.
- (2) Never say that you didn't see it in the paper (even if you didn't).
- (3) Handwritten copy makes a very poor presentation . . . type your copy. And double space it.
- (4) Never try to expand your space by getting pushy or pestering the editors. Take what they give you and appreciate it.
- (5) At shows, banquets, installation of officers, etc., if you invite the media to send a reporter, photographer, or TV cameraman, stay with these

people and help as much as you can. Get the names and official club titles, if any, of the people in photos (and check the spelling of their names); the order of people in the picture, direct them to outstanding displays, etc. In other words, help them do their job and, unless they wish to stay, be on their way to other assignments as soon as possible.

- (6) For outstanding display or a well-written article, a thank-you note from the secretary will show the organization's appreciation.

Keeping Ahead of the Game:

Advanced planning is the only way any good club press agent can expect to keep from tripping over his own feet. Volunteer help may be forthcoming from the other members, but don't count on it. The best source of man-power is the junior members of the society. The kids are often left out in the scheme of the programs. With the right approach, you can have a legion of hard-working, dependable assistants who can paint the posters, pass out leaflets, even gather the material or make pictures for the release.

A club newsletter is usually tossed to the publicity chairman (as if he didn't have enough to do already!), and in doing this job the publicity chairman *must* have help. Contributions from the other members are mandatory. If he can't depend on a monthly instalment from each officer, an article on the fish-of-the-

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month, or aquarium tips and other tid-bits of information, the club can just forget about a major publication. The single mimeographed or Xeroxed sheet containing the monthly meeting notice and order of programs will suffice until the members of the society decide

that they want something a lot fancier . . . and decide that they're willing to do the work necessary to get what they want.

In conclusion: it can only be said that even though the best laid plans often go astray, the only way to play the game is to plan ahead.

Note: Club publicity chairmen and others who want to get free representation in the press and other news media are missing a good bet by not taking advantage of the tendency of public officials to tie in with popular activities.

In Cincinnati, for example, the Greater Cincinnati Aquarium Society worked with Robert Johannigman of Loveland Pet Products and with the Pet Industry Distributors Association, a group of pet products wholesalers, to gain the cooperation of Cincinnati mayor Eugene Ruehlman in proclaiming the week of July 6-13 Tropical Fish Week in Cincinnati. The GCAS was therefore able to garner extra attention for its international tropical fish show and was able to receive important recognition for the good work done in maintaining aquaria in Cincinnati hospitals and in a residence for homeless boys. And in Florida, the Aquarium Society of Broward County was able to obtain Governor Claude Kirk's approval for naming the week of May 1-7 as Tropical Fish Week in Florida. The ASBC members were no doubt helped by the fact that fish farming is an important commercial operation in the state (a fact noted in Governor Kirk's official proclamation). But whatever reasons mayors or governors may have for cooperating with tropical fish clubs, the clubs stand to gain. Not only do they receive attention that otherwise might not have been obtainable, but they also usually receive credit for public services rendered, and this is always worthwhile.

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Three adult male *Aphyosemion bivittatum* from three different areas in West Africa, illustrating the natural differences between geographically separated populations of the same species.



November, 1969

Spawning *Aphyosemion bivittatum* *bivittatum*

Photos by Col. J. J. Scheel.

BY RUDOLF ZUKAL

Most of the representatives of the large family of the egg-laying tooth carps are gorgeously colored and generally peaceful; many hobbyists like them because of their very interesting manner of living and of procreating. *Aphyosemion bivittatum bivittatum*, known to European hobbyists since 1906, is no exception.

This species demands warmth, so I keep it in a small to medium-sized tank at a temperature of 70°F. Planting should be abundant, rounded out with floating plants. The fish does well in soft, slightly acid water (pH 6.5-6.8). *A. bivittatum bivittatum* is peaceable, generally keeping to the middle reaches of the water. Specimens often jump out of the water, for which

This adult male, a result of a cross between a male and female *A. bivittatum* from different areas, was sterile.



Tropical Fish Hobbyist

reason tanks should always be kept well covered. They are best kept with their own kind and should be fed almost exclusively with live foods.

Breeding for the species resembles that of *Aphyosemion australe*. Use a temperature of 76°F, a small tank, soft, slightly acid water, and fine-leaved plants therein. The male is very passionate when chasing, which often results in getting the female killed. For this reason the females should only be set up for spawning when really full of roe. It is best to place two or three females with one male. About one hundred eggs are released during the spawning period. After the spawning, remove the parents. In case it takes



Another beautiful but sterile male, this one produced by a cross between a male of the western Nigerian delta country and a female from Dahomey.

November, 1969

the fish several days to spawn, siphon off the eggs by means of a glass tube every day. The eggs are rather large and easily visible. Place them in small, clean dishes. The water should show the same composition as that in which the fish have spawned. It is advisable to use water from the same tank, topping up the aquarium with fresh water thereafter. The water level in the dishes should be low ($\frac{1}{4}$ " to $1\frac{1}{4}$ "). Cover the dishes and place them in a cupboard, for the eggs are sensitive to light. You will have to remove the infertile eggs daily. In case the eggs were collected during several successive days, you will need several dishes, each provided with a date tag. The fry



The difference in size between the anal fin of this adult male (non-hybrid) *A. bivittatum* and the one shown on the facing page is considerable, illustrating just one of the reasons hobbyists and ichthyologists alike have had difficulty in the classification of some of the rivuline species that interbreed readily.



Wild-caught specimen from western Niger delta.

hatch after about 14 days, when they should be transferred to a nursery tank with the utmost care.

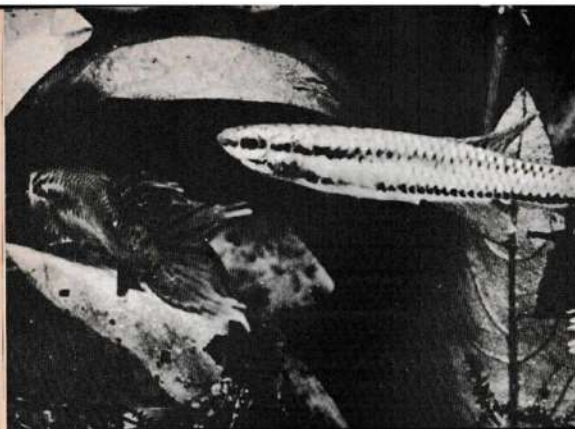
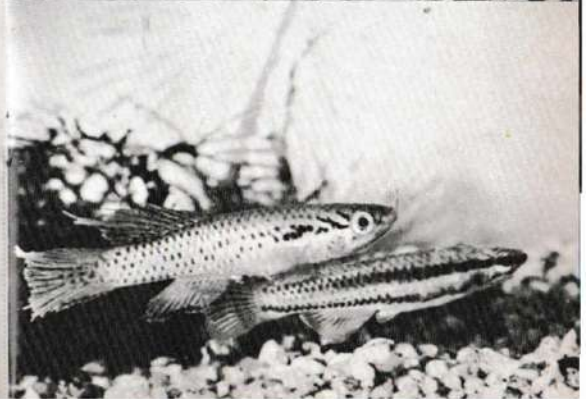
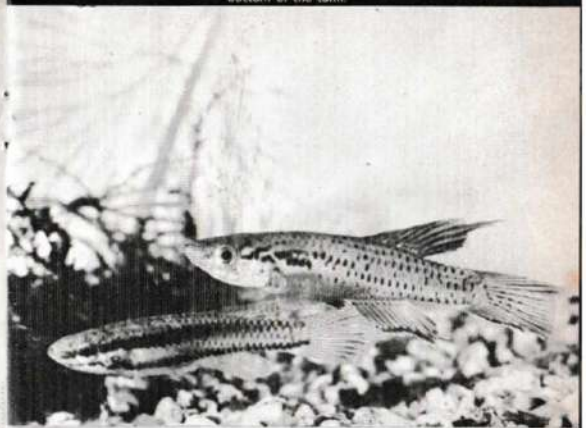
After about three weeks of rest, the females are full of roe again and spawning may be repeated. The young are sexually mature in six months.

The sub-species *A. bivittatum hollyi* was introduced in Europe in 1920. It differs from the typical form by a more elongated body and a bluish coloration and is a little smaller than its near relative.

Wild-caught specimen from Beko in western Nigeria.



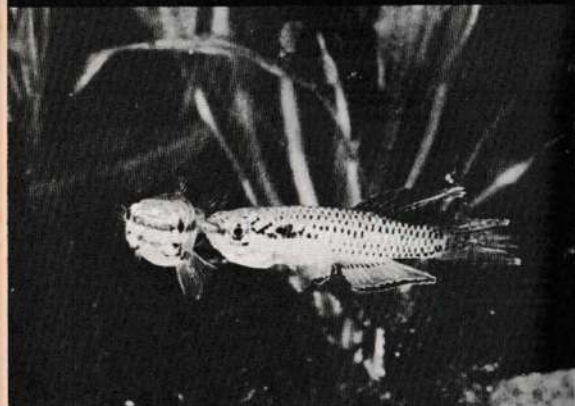
The male begins the spawning chase by approaching the female and trying to lead her in the general direction of the spawning site, which in the particular spawning illustrated here was a clump of Fontinalis at the bottom of the tank.



The male, more insistent now, blocks the female's path and spreads his fins and quivers in an effort to impress her (top); below, he nudges the female along to the spawning site by tapping her around the head and mid-section. Females that fail to respond to the males' efforts are sometimes treated very roughly.



The female has accepted the male's attentions and has approached the plant growth; notice that at this time her longitudinal bands are still easily visible, whereas in the lower photo, taken at almost the exact instant of egg-expulsion, the bands have almost disappeared.



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MEET THE HOBBYIST . . .

Kappy Sprenger

BY LEE QUARNSTROM

Kappy Sprenger didn't get much sleep when her youngest child came home from the hospital six years ago. The newborn infant insisted on crying through the night and Mrs. Sprenger, a dutiful mother, stayed up with her daughter. In situations like that many mothers take up knitting or tune in the all-night movies on television. Not Kappy Sprenger. She got herself an aquarium.

Tropical Fish Hobbyist

"I wanted something that would hold my interest," she says.

Well, the aquarium certainly did hold her interest. Today Kappy, who lives in Los Gatos, California, has a roomful of aquariums, a backyard pool stocked with African cichlids, and a 50-gallon tank housing a rare Central American cichlid, in her kitchen. She writes a column for a hobbyist newsletter and does artwork for several hobbyist publications.

What's more, Kappy Sprenger today, six years after she purchased her first aquarium, is a noted breeder of Nyasa cichlids.

Her husband, Don, is an engineer for the Lockheed Corporation. "He bowls and plays golf for fun," Kappy says. But Don Sprenger is more than tolerant of his wife's interest in tropical fish. He did most of the work on the backyard pool, although Kappy helped mix the cement.

"The only things that bother my husband are the treefrogs," Kappy says. "They chirp all night and sometimes keep him awake."

The treefrogs are kept as delicacies for a five-foot gopher snake kept by the Sprengers' three children and some of their young friends. The treefrogs do indeed chirp. I heard them several times during my visit.

The snake, by the way, is but one of many pets in the Sprenger household. There are five cats ("strays," Kappy calls them), and a dog.

One of the cats is obviously interested in the fish living in the backyard pool. But the pond is deep enough and wide enough that the fish have no trouble keeping out of harm's way.

The fish in the pool include *Pseudotropheus elongatus*, *Pseudotropheus tropheus*, *Haplochromis burtoni*, a fish Kappy has been calling *Petrotilapia tridentiger* (more on this later), blue gouramis and guppies put in the pool to devour mosquito larvae. There are also hundreds of tiny tadpoles clinging to the bottom of the pool.

When I visited the Sprenger home late in March the fish had been in the pool about a week. Kappy says she first put them out earlier, thinking that the first bright rays of spring sunshine meant warmer temperatures. She was wrong. The fish, especially the Nyasa cichlids, were obviously distressed by the cool water, so they were returned to their indoor homes until the mercury rose. Kappy says she is thinking about installing an outdoor heater in the pool. At present, however, she is experimenting to discover what works best in the pond.

Teddy, the resident of the 50-gallon aquarium in Kappy's kitchen, is a rare *Cichlasoma dovii* cichlid from Central America.

Kappy says there were only four *C. dovii* in the United States, including hers and those owned by well-known aquarists Gene Wolfshiemer, Guy Jordan, and Dick

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Kappy shows off Teddy, whose bare 50-gallon tank is housed in the kitchen, along with others. Photo by Dean Quarnstrom.

Stratton, until quite recently. But seven young specimens have recently been brought back by Dr. George Barlow, of Berkeley.

Kappy adds that managuense cichlids, another cichlid from Central America, are being sold as the dovii, which they resemble, by some dealers. She says the managuense, one of which has a tank in her fishroom, is neither so rare nor so beautiful as the dovii.

The dovii certainly is beautiful. It has a blue-green sheen to its body, with a pinkish cast over the rear portion. With its dark spots on the lighter blue-green background it almost resembles a Jack Dempsey in reverse.

Teddy joined Kappy's aquatic family when he was only three inches long. That was two years

ago. He was brought back from Central America by Dr. William Bussing.

Teddy is as aggressive as he is beautiful. The Bulletin board hanging on the wall behind his aquarium has become his own "property." He becomes quite perturbed whenever strangers go near it. When the bulletin board is disturbed Teddy rushes toward the offending party, mouth open, teeth bared. At such times it is reassuring to realize that he cannot escape the confines of his tank.

She feeds her dovii every three or four days, mostly on live minnows, beefheart, and scallops. The fish likes to play with his minnows, occasionally spitting them out in order to continue the chase.

The temperature in the dovii's

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aquarium is 68-70°, considerably cooler than the 83° of his native Lake Managua. Kappy has tried to warm the tank with a heater, but Teddy doesn't like any thing unusual in his aquarium and makes short work of the heaters, pushing them out of his home and onto the floor.

In her fish room Kappy has, besides the managuense, many aquariums filled with the Nyasa cichlids.

"Actually, they're not called Nyasa cichlids any more," Kappy points out. "Lake Nyasa is now called Malawi, so people have begun calling the fish Malawi cichlids. The native name for the fishes is 'Mbuna,' and hobbyists are beginning to call them Mbuna cichlids, too."

Kappy's first cichlids were oscars and angels. She says she became interested in the more unusual Nyasa cichlids when oscars and angels started to become more commonplace at tropical fish stores.

She raises the African cichlids in conjunction with a local fish dealer. She says she is now making enough money to support her interest in tropical fish.

African cichlids in the fish room aquariums include, in addition to more of the types kept in the pool, *Pseudotropheus auratus*, *Pseudotropheus zebra* (of both the striped and solid blue cobalt varieties), *Labeotropheus fülleborni*, and *Labeotropheus trewavaseae*. Other fish in the room include geophagus, angels and guppies.

At the time this photo was taken, Kappy's *Cichlasoma dovii* was fourteen inches long and still growing; in a tank big enough, the fish could grow to almost two feet long. Photo by Dean Quarnstrom.

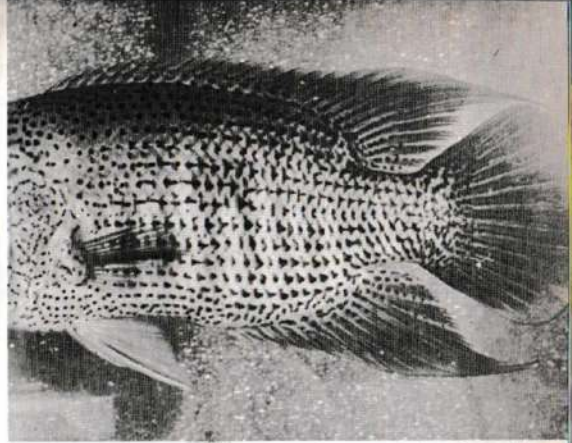


"I keep the guppies so I can have some live plants," Kappy says. "The Nyasa cichlids are terrible ruffians, so I can't keep live greenery with them for long." She uses plastic plants to great advantage in several of her tanks.

Most in evidence in the fish room during my visit were several tanks of the fish which Kappy has been calling *Petrotilapia tridentiger*.

Kappy is quite certain now that they are not, in fact, *P. tridentiger*. She points out that there has been a great deal of confusion among hobbyists and scientists regarding the proper names of the Nyasa cichlids.

"They may be *Pseudotropheus fuscoideis*," she says. "But I'm waiting for the people at the British Museum to decide what they really



are." She says the British scientists are considering four different possibilities. Until Kappy hears from the scientists she is referring to the fish as tridentigers. *

Kappy gave me several tridentiger babies when I left. I have them in a 50-gallon aquarium and am looking forward to using Kappy's tips on breeding them.

She says the tridentiger, which is a mouthbrooder, lives and breeds in an unusual community manner. She prefers to have females at the ratio of two or three for each male in her tanks.

Females spawn at intervals of six to eight weeks. When one spawns Note: Drs. Fryer and Trewavas of the British Museum have tentatively identified the fish in question as a *Melanochromis* species.

it starts a rash of spawning by other females in the same tank. A second female will spawn within three to five days of the first and another within three to five days of that.

Kappy doesn't know the reason for the peculiar spawning schedule. She says that perhaps a hormone is secreted during the excitement and the others are affected by it.

Although she doesn't know the cause of the peculiar tridentiger behavior, Kappy does take advantage of it. She says she has had great success with this mouthbrooder.

The mothers incubate the fry for almost three weeks, including a week before the eggs hatch. They are extremely close-mouthed about it, too. A female with a mouthful of young never once let any of her brood escape during my visit.

Tropical Fish Hobbyist

Kappy says the mothers might release a few of the fry occasionally to determine when it is time to let the babies fare for themselves.

She also says that some mothers refuse to have anything to do with fertilized eggs, spitting them out and ignoring them.

When the mother finally releases the fry she watches to see if they can move about on their own. If they are unable she takes them back into her mouth for a while longer. If she is satisfied with their behavior she permits them to start getting along on their own.

When a mother is obviously done caring for her fry Kappy puts her back into her tridentiger community tank. Before the female is replaced, however, Kappy removes the rocks from the aquarium to confuse the other tridentigers and take their attention off the recent mother, whom they might otherwise bully because of her weakened condition.

The tridentigers like to stay partially hidden in caves among the lava-like rocks in Kappy's aquariums. But being inquisitive fellows they poke their heads out from their holes and follow each movement in the room. A rich, golden brown, they blend perfectly into the shadows in the rocks.

Several tanks in the fish room were darkened the day I visited. Kappy explained that a friend is in Costa Rica on a fish-hunting expedition.

"I'm hoping he'll bring me back some fish," she told me.

What kind?

"Maybe some cichlid species that haven't been brought into the country yet."

Lucky girl!

"Scrappy Kappy," a column of reviews and opinions, appears in the San Francisco *Anchor*, the bulletin of the San Francisco Aquarium Society. Kappy also does art work for the bulletin, as well as for *Aqua Jewels*, a hobbyist publication in Fort Lauderdale, Florida, and for the identification of illustrations of tank inhabitants of Marine World in Redwood City, California; she also contributes to the newsletter of the American Cichlid Association.

As if her fish and her family and other household residents didn't keep her busy enough, Kappy spends a lot of time talking with other hobbyists who have problems with their fish. She also finds time to care for the fish of friends who are unable to handle their charges while on vacations or for other reasons.

While I was visiting the Sprenger household a dozen neighborhood children were running around the yard, most of them interested in the gopher snake in a plastic terrarium. The dog was opening the sliding glass door from the back yard and running through the house. One cat, Ratfink, was eyeing the fish in the backyard pond, unhappy that they were beyond his reach.

It was a happy household and one that I hope to enjoy visiting again.

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Q. I've been a salt-water hobbyist off and on now for a few years and have had a good degree of success with four or five different species, mostly damsels and clown fish, but every single butterfly fish that I ever bought (4, always one at a time) has died within a few weeks of my buying it. Is there something special that you have to do

to keep butterflies alive? Friends of mine are able to do it without going to any great trouble, but even they don't know why they succeed and I don't.

William Ronzer
Brooklyn, New York
A. Most of the butterfly species are a bit touchier than damsels and clowns, so it's generally con-

ceded that they're harder to keep. The big trick in getting butterfly fish to adapt to life in your tank is to get them to feed regularly, and the way to do this is to provide them with plenty of hiding places, because they're "scary." Once they're over the hump as far as feeding is concerned, they'll usually do fairly well. . . . but it is definitely true that as a group the butterflyfish are more difficult to keep than other popular marine species.

Q. 1. If you boil sea fans to remove the flesh, would they be safe to put into the marine aquarium?
2. Will you please print a picture of an adult black angelfish, *Pomacanthus arcuatus*?

Gary Gehwat
Melrose Park, Illinois

A. 1. Yes, but make sure that all organic material from the fans is

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Pomacanthus arcuatus

off, and cure them by setting them out in the sun for at least a few days.

2. Yes (see accompanying photo). Q. Why don't more people who would like to keep marine species but don't want to spend the money for salt-water exotics use some of the cheap and always available brackish water aquarium species that can be converted to life in regular sea water as "guinea pigs" to see whether they can get

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them to live in a marine setup? In this way they could gain some valuable experience in maintaining a marine tank without going to the expense of purchasing salt-water fishes.

Harvey Glover
Oconomowoc, Wisconsin

A. You've outlined a pretty sensible arrangement for trying your hand with marine tropicale without spending too much money, and I frankly don't know why the method isn't used very often. I think that at least part of the reason is that although converting brackish water fishes (wollies are

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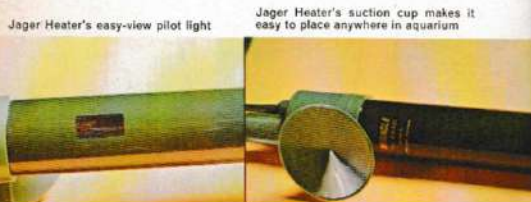
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Commercial Operation

Q. If a serious tropical fish hobbyist would like to enlarge his hobby into a large scale commercial hatchery operation, how would he go about obtaining the necessary information to help him start the business?

Ed Kosol

Alamogordo, New Mexico

A. I don't know of any books in this line. Experience would seem to be the best teacher. This can be gotten by either starting small and growing as you learn, or by going to work for a large commercial hatchery to gain experience. The major problem is finding a market and locating in an area from which air transportation is excellent.

All Male

Q. If I decide to have only male fish in my tank will the fishes survive? Since the males are more

attractive than the female, I do not want to crowd my tank with relatively unattractive females.

S. Bhatt

Manchester, England

A. You seem to assume that the only thing that makes a fish attractive is color and finnage. If you

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stock your aquarium only with males, you will miss the very interesting behavior that comes about with the interaction of the sexes. I am sure your males will survive, but I doubt they will be very "happy"!

Discus Hatch

Q. I recently bought ten large discus with a 140-gallon aquarium from a man who had raised the discus from babies in water that was softened by peat moss and was highly acid. When I brought them home, I put them in hard alkaline water. A few weeks after I got them, two of the discus paired off and laid about 200 eggs. Two days later all the eggs but about ten turned white. When the babies were free-swimming, the parents ate them. Two weeks later the fish went through essentially the same procedure. What can I do to prevent the parents from eating the fry and to increase the percent of hatch?

Ronald Robey
Richmond Heights, Ohio

A. It is fairly characteristic of discus pairs to produce a large percentage of infertile eggs at first. The percentage of good eggs usu-



Discus tending eggs on leaf; one egg has already fergusoned

ally increases with time. As for raising the fry, I would say that the first thing to do is to give the parents privacy. Even in a large aquarium such as yours, eight intruders will keep the parent fish in an uproar all the time. It would also be a good idea to use a good percentage of rain or distilled water for breeding.

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November, 1969

Electric Affair

Q. While cleaning the tank my eight-inch *Clarias* catfish is kept in I moved him to an aquarium containing a seven-inch electric catfish. After having bumped into each other accidentally, the *clarias*



Electric catfish

was left lying on his side. Since they bumped into each other accidentally, would it be safe to keep

the *clarias* with the electric catfish in a ten-gallon tank?

Ralph A. Ardito

Weehawken, New Jersey

A. It would be very difficult for two large fishes to avoid "bumping" into each other in a tank this small. This combination cannot be recommended.

Fat Kuhlis

Q. I have four kuhli loaches, two of which have bulging, light blue stomachs.

1. Are these loaches egg-laden?
2. If they are, how do I breed them?

David Siegel

Miami Beach, Florida

A. 1. It sounds as though you have two females which have filled with eggs.

2. I would try an aquarium with soft water, plenty of hiding places, and a peat bottom.

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Angel Problems
Q. We raise angelfish commercially and we have three problems: incomplete gill covers, crooked spines and enlarged stomachs. This last problem occurs when the fry are about to become free-swimming. They can neither swim nor eat. Any suggestions you could give would be appreciated.

Hilda Brown
Pendleton, Indiana
A. Whenever I get letters like this from a commercial operation I can be fairly certain that the problem comes from inbreeding. The only cure is new breeding stock. The prevention is to introduce new blood into your breeding lines several times each year. This should be from strains which are not related to yours.

Sodium Poisoning
Q. The water in my area is very alkaline and hard. I can control the pH but I am having problems with DH. One aquarium store keeper says not to use resin exchange filters because they take out all the calcium and magnesium and replace them with sodium. He recommends using distilled water. Although I respect his much greater knowledge of aquariums, I have

read many books which recommend the resin filters and say nothing about the sodium problem.
Bob McCoy
Palos Verdes, California

A. As is often the case, both of your authorities are right. The sodium concentration can become

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excessive when the resin method is used to soften water which is extremely hard. The same method used on moderately hard water is usually completely safe. Under any circumstances, it is better to soften your tap water by diluting it with rain, distilled, or snow water.

Fire Barb
Q. I recently bought a fish called a fire barb.
1. What is its scientific name?
2. What should it be fed?
3. How is it bred?



Rasbora vaterifloris

Bruce Maitland
Richmond, Virginia

Sand Fungus
Q. I have a 55-gallon aquarium equipped with an undergravel filter which runs constantly. I have seven large fish in the tank. My problem is a white algae-like growth which forms on the sand, glass and heaters. Six months ago I completely cleaned the tank and replaced the gravel, but this stuff has returned. Is there any way of destroying this pest?

Lee Hoerchner
St. Paul, Minnesota

A. This sand fungus is most likely to be a problem in aquariums without plants and which have a lot of waste products produced by either a large number of small fishes or a relatively few large fishes. Changing about one quarter of the water each week will keep this material down, especially if it is accompanied by a vacuuming of the sand to pick up waste materials.

Dwarf Cichlids
Q. I have bred both *Nannacara anomala* and *Apistogramma ortmanni*. Everything went well until the eggs hatched. Shortly after the fry were eaten even though the parents had tubifex available all the time. How can I prevent this?
Ed Tyberghein
Lincroft, New Jersey
A. One thing that may cause dwarf cichlids to eat their fry is a



Apistogramma ortmanni, male

disturbance outside the tank. Many aquarists cover the glass with paper, leaving only a single peephole. You may want to try hatching the eggs artificially, as is done with angelfish, or removing the parents after the fry become free swimming.

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Firemouth Cichlid
 Q. I have been going over some material on firemouth cichlids (*Cichlasoma meeki*) and I am very confused about one thing. One book says you can keep them with fishes not smaller than themselves, another book says they are vicious and yet another book says they get along with all fish. What should I believe?
 2. At what size can they be bred?
 3. Is it safe to keep the eggs with the parents?

S. Ferguson
 Worcester, Mass.
 A. 1. You should believe all of your sources. The apparent contradictions are a good indication that the fish acts differently under different

conditions. They are more to be trusted in large aquariums than small ones and in large numbers than in small numbers.
 2. At about two inches.
 3. It depends a great deal on the individual pair. Most are good parents.

Indian Pen Pal
 Q. I am a hobbyist interested in the hobby for more than 14 years. I am the president of the local aquarists' society. I have five twenty-gallon aquarium, one 50-gallon and five ten-gallon aquariums. I have successfully bred gouramis, bettas, golden barb and goldfish. I am interested in getting into contact with other hobbyists to exchange views and fishes.

P. B. Krishnamurtty
 4, Balakrishnaiyer Rd.
 Valmikinagar
 Madras-41
 India

A. We are publishing your entire address so that interested hobbyists may contact you.

Over-Stuffing
 Q. I have an aruana and a snakehead in the same aquarium. The snakehead is such a glutton that he grabs up all the food before the



Snakehead, *Ophiocephalus* species

aruana can get more than one or two fish. If I feed the snakehead enough to satisfy him so that he will let the aruana eat, he becomes literally bloated. Would this excessive stuffing be hard on the fish?

Terry Sandrom
 Goleta, California
 A. The old rule of moderation in all things would seem to apply here. While fish may stuff themselves in nature, this does not happen very often, and a continual opportunity to do this is probably not good for the fish. You might try putting a partition into your aquarium when you are feeding to separate the two fishes.



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Pop Eye
 Q. We lost a particularly beautiful male ram from pop eye. This disease has plagued us throughout the three years we have kept tropical fishes. No book seems to give an answer as to a cause or a cure. We have tried both salt treatment and darkness, neither of which seems to work. What can we do?

Cathy Nace
 San Diego, California
 A. I am of the opinion that pop eye is caused by a bacterial infection. For this reason, salt and darkness will have little effect on the disease. Unfortunately, there is no substantiated report of a cure. If a cure is to be found, it will doubtless be an antibiotic. You have mentioned having several cases of this disease. It might be well to treat the aquarium with tetracycline to kill any free-swimming bacteria that may infect future fishes.

Killifish
 Q. What exactly are killifish? They seem to come from several different genera. Can you tell me what they have in common to justify this common name?

Ronald Vincent Smith
 Surrey, England

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A. The term killifish is used as a general term to include all the fishes of the family Cyprinodontidae, just as the term livebearer is used for the family Poeciliidae. The word killifish is derived from a Dutch word referring to small bodies of moving water.

Pygmy Gourami
 Q. I have a pair of pygmy gouramis in a ten-gallon community aquarium that is heavily planted with hornwort. The fish are rather shy, but quite comfortable among the dense foliage. Recently I noticed something very strange. The fish began to circle each other with spread fins and brilliant colors. At intervals the male would shake his body and produce a definite clicking sound like a lead wrist watch. This has happened many times.

1. What is this sound?

2. What is the proper scientific name?
 3. How is this species bred?

David Sadewasser
 Hammond, Indiana
 A. 1. There has been some argument whether the fish should be placed in the genus Ctenopoma or the genus Trichopsis. In the not too distant past many authors assumed that the genera were synonymous and used the name Ctenopoma for all the croaking gourami group. It has been recently demonstrated that there really are two distinct genera. The genus Ctenopoma should contain only the species nobilis, which has not to the best of my knowledge been kept in the aquarium, and the genus Trichopsis is the proper genus for all the other croaking gouramis including vittatus, schalleri, and your fish pumilus.



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2. All the males of this genus produce sound when courting. There is a good chance that your pair had built a nest which you did not notice because of its small size.

3. This species is not difficult to breed if given a small well planted aquarium. The male builds a small bubble nest in which the fry are



Trichopsis vittatus

deposited. They hatch in about two days and require infusoria as a first food.

Gnathomemus

Q. I recently purchased a two-inch elephant nose and I would appreciate any information you can give me regarding:

1. Mature size.
2. Food requirements.
3. Habitat.

Jeff Moore
Chicago, Illinois

A. 1. Nine to ten inches.
2. Healthy fish will eat nearly anything that will sink to the bottom. Fish which do not feed should

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YOUR FISHES' HEALTH

ANCHOR WORM

BY ROGER LEE HERMAN

The so-called *anchor worms* are parasitic copepods. They are closely related to the copepods which fishes eat and distantly related to such forms as crayfish, shrimp, and even insects. These all belong to a group of animals which the zoologists call the class Arthropoda. This group of animals is characterized by having a hard, chitinous shell (exoskeleton), jointed legs, and compound eyes.

Copepods develop through a series of stages involving considerable change in shape so that the adult does not look like the larvae. *Lernaea cyprinacea*, which is the most important of the anchor worms, hatches from the egg as a nauplius, molts (sheds the exoskeleton) to become a metanauplius, then passes through four copepod stages, molting each time. During the last copepod stage the male and female mate. The male then dies

and the female penetrates the skin of the host and grows to the adult form. Thus, the anchor worms one sees on fish are always females. They appear like small spaghetti hanging from the center of a reddened area on the skin of the host. *Lernaea cyprinacea* females may grow to a length of 1/2 of one inch. When mature, two sacs, containing eggs, are found at the posterior end of the animal. By this time, the head of the female has developed cephalic horns which serve to anchor her in the flesh of the fish. These account for the common name of the anchor worm.

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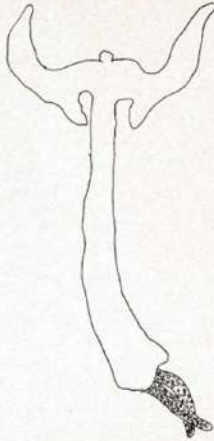
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Lernaea is usually a parasite of warm-water fishes. The optimum temperature for the animal is between 73° and 86° F. The entire life cycle takes from 2 to 3 weeks at 75° to 82° F. Adult *Lernaea* may tolerate brackish water up to 1.8‰ salt. The larvae are less tolerant of salt. It is interesting that this parasite does not seem to occur in water with a pH of less than 7.

Like any other parasite, *Lernaea* causes reduced growth by stealing food from the host. The place where the female penetrates the skin is a site for infection by fungus or bacteria. The increase in size of the copepod, particularly the cephalic horns, causes tissue damage by pressure. This is very dangerous in small fish when the parasite penetrates into the abdominal cavity. Here the vital organs may be so compressed that they cannot function properly. Heavy infestations can result in the death of the host.

Lernaea cyprinacea was said to be the most important species in



Adult female anchor worm, showing egg sacs at posterior.

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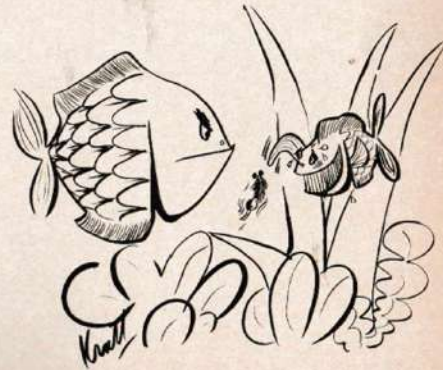
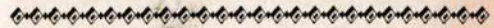
this group. This is because it can attack almost any species of fish and will even parasitize tadpoles and salamanders.

The large size of the parasite makes it easy to see. In addition, one's attention may be drawn to the fish by "flashing" as they try to scrape off the irritating parasite. Heavily infested fish will become

lethargic and may lose their sense of balance.

Preventing the parasite from getting into your aquarium or pond is, of course, the best cure. As with other diseases, quarantine of new fish is desirable. In this case up to a month, depending on the temperature at which they are held. Quarantine tanks, as well as infested tanks, may be treated with chemicals. The larval forms are easily killed by dipping the fish in 3 to 5% salt for a short time or by placing them in 250 ppm of formalin for 30-60 minutes. This should be

repeated in 3 weeks. Potassium permanganate kills both larvae and adults. It may be used as a short bath (10 ppm for 30-60 minutes) or an indefinite bath of 2 ppm. Insecticides such as Gammexane and Dipterex have been used against this parasite but these are highly toxic to fish and humans and should be used only by experienced workers. When only a few fish are involved, it is perhaps best to simply remove the adult parasite with a pair of forceps (tweezers). The wound should be dabbed with a disinfectant.



The Stripecy

BY GERALD R. ALLEN
Department of Zoology,
University of Hawaii, Honolulu, Hawaii.

Nearly all of the popular marine tropicals exported to the mainland from Hawaii are captured by professional collectors, often with the aid of scuba gear. But the stripecy, *Microcanthus strigatus*, is a local favorite that is accessible to even the most inexperienced collector. This fish is an ideal species for the beginning marine hobbyist because of its attractive appearance, pleasant disposition and hardiness in captivity.

The stripecy bears a strong resemblance to the butterfly fishes of the family Chaetodontidae. In fact, when ichthyologists first described the species in 1831, it was included in this group. Subsequent researchers have shown that the stripecy actually belongs to the family Scorpididae (not to be confused with the scorpion fishes of the family Scorpaenidae). Important characters which separate stripecys and the butterfly fishes are the structure of the skull and mode of attachment of the ribs.

The stripecy is found in other areas of the Pacific as well as Hawaiian waters. It is distributed on the fringes of the south and central Pacific faunal region and has been reported from the Queensland coast of Australia, the Philippines, the China coast, the Ryukyus and southern Japan. It seems likely that the stripecy has become established in Hawaii via the warm extension of the Kuroshiro Current, which swings eastward from the coast of Japan in the general direction of the Hawaiian Islands.

The juveniles of this species are of special interest and are easily collected in rocky tidepools on Oahu from December through April.

They can be caught at low tide during either the day or night. Night collecting is especially productive. I can vividly remember one April night when my brother and I went stripecy collecting at Diamond Head Beach Park in Honolulu. We had just purchased a small shrimp seine and were eager to give it a try. We located a large tide pool about 10 feet in diameter and 2 feet deep with a connecting outlet to the open sea. Sure enough, the rays of our flashlights picked up a school of stripecys darting around the pool. These fish seem to prefer the larger pools which have an abundance of loose seaweed, and they are sometimes hard to spot as they swim in and out of the floating weeds. One end of the pool narrowed down into a shallow channel, so we positioned the seine across this channel and then waded through the pool, gradually herding the stripecys in the direction of the net. After several minutes we managed to drive the majority of the school into the seine. The result was a catch of nearly forty 1 to 2-inch stripecys



The stripecy normally adopts a slightly angled position in the water, with the head held down; in older individuals, this tendency is less pronounced.

along with juvenile convict surgeon fish (*Acanthurus sandvicensis*), small goat fish (*Parupeneus prophyreus*) and a variety of damsel fishes. On this particular outing we were only interested in the stripecys, so we sorted out the best-looking specimens and turned the remaining fish loose.

When the young stripecys first make their appearance in Hawaiian waters during the latter part of December, they are less than half an inch in length and grow to a size of between 1½ and 2 inches during the first four months. Provided with the proper care and feeding, aquarium specimens will closely approximate this rate of growth. At the age of four or five months, the young stripecys move out of the tide pools and take up an existence in the shallow surge area just outside the pool zone. When the fish reach a length of 3 to 4 inches (at an age of approximately one year), they move out into deeper water. The adult fish attain a length of about 5 inches, and although they are equally as attractive as the juveniles, they are a bit large for the average home marine aquarium.

In their natural habitat, young stripecys feed upon small crustaceans and a variety of algal materials, so it is wise to include some plant matter in their aquarium diet in addition to feedings of frozen and live brine shrimp, baby guppies and dry flake food.

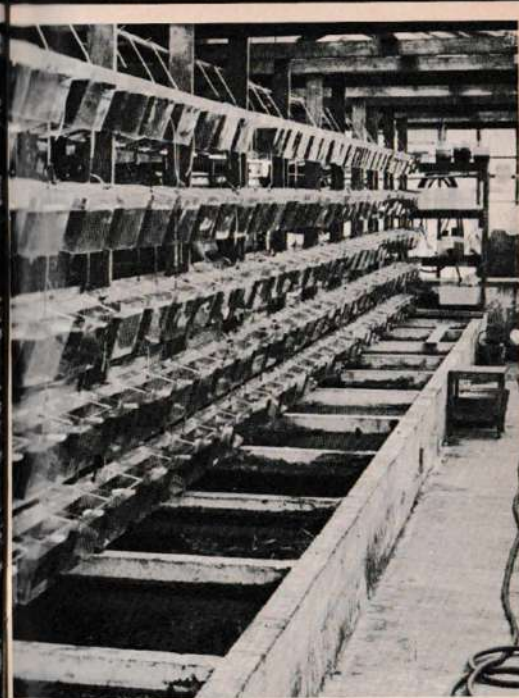
After keeping this species in aquaria for nearly four years, I can strongly recommend them to both beginning and experienced marine aquarists.

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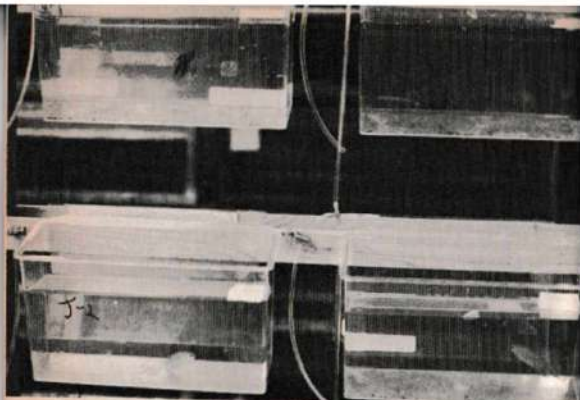
BY DR. HERBERT R. AXELROD
Photos by the author

Thousands of plastic tanks are used for spawning small fishes. Plastic tanks (one gallon capacity) have few advantages over glass tanks, but these are rejects from Hydramatic filters and no other use could be found for them!



My mail is heavy these days, and it is impossible to answer the 100 or more letters which arrive every day. But most of the letters have the same theme . . . from hobbyists: "Where can I buy a certain fish?" And from dealers: "Where can we buy fish?"

In Florida today there are hundreds of fish farms which breed tropical aquarium fishes. Very few of the farms raise a complete "line" of fishes for



Gulf raises many bettas and paradise fish. They use a piece of floating styrofoam in each small plastic tank instead of a floating leaf so the entire equipment can be sterilized and cut down loss of eggs.

Francis Buzby, one of Gulf's breeders, inspects spawns of thick-lipped Gouramis. Normally Francis will set up 200 pair to spawn at the same time and raise all of the fry together. He uses the light to view the eggs in the bubblenest.



The office crew. The gentleman on the right is Dwain Meredith.

the aquarium, and fewer still import fish to complete their "line." Gulf Fish Farms, which is owned by our company (Miracle Pet Products, Inc.), breeds 5,000,000 fishes a year and imports about 2,000,000 fish. There are several other farms in Florida which have "lines" as complete as Gulf's, but I don't have access to their facilities so I don't know much about them.

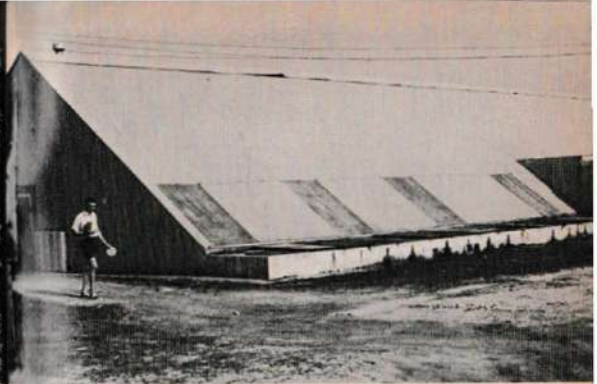
Gulf is probably a typical fish farm, so I thought I'd show our readers what makes a fish farm "tick," and perhaps cut down the mail a bit.

Gulf is located in Palmetto, Florida, about 40 miles south of Tampa airport. Gulf is actually 5 fish farms spread over about 10 miles. The total acreage under cultivation is about 200. The payroll is about \$150,000 per year for full-time employees, and about 65,000 boxes a year are shipped from the farm. A great many of our fishes are sold locally to other farmers who use them either for breeding stock or to sell to their customers. Runts and mis-colored fish are sold to certain customers who specialize in the 5¢ and 10¢ store trade. There is a market for every fish bred.

The 200 acres on Gulf are split into about 2,000 pools. The pools when dug are about 40 feet wide, 100 feet long and 12 feet deep. Each pool is equipped with an overflow pipe and running water from one of the deep wells which supply the water to the whole farm. The sulfurous water coming from 600 feet deep in this part of Florida is poisonous unless aerated prior to use, so small amounts are sprayed into the pools on almost a continuous



The dragline bucket digs out the banks between the pools so the pools can rotate their position annually, giving the pools fresh dirt which supports more life than washed out sand.



A typical fish building at Gulf is aluminum-clad, fully insulated with minimum airspace to heat. Square buildings are too costly to heat and the roof too easily leaks. This type of building has proven to be perfect for fish farmers. The building measures about 50 x 300 feet long.

basis. As the pools get older, their bottoms fill with muck and they become more and more shallow; the shallower they become the less productive they become, so Gulf tries to drain, re-dig and pump each pool once a year.

A normal pool is stocked with 500 fish; 400 females and 100 males. If the pool has been stocked in April or May, as it should, we can expect to harvest from the pool in October when the 500 (let's take *Xiphophorus variatus*, for example) fish have produced almost 25,000 babies. It's not just that easy, of course.

Even if the fish live through attacks by birds, snakes, crawfish, huge frogs and air pollution, as well as wild fish which get into the pools every now and then, they might be stolen or poisoned. I would guess that 75% of the fish born never are shipped. That's what makes them expensive.

But let's get back to the pool. Once the pool is ripe for harvesting, traps are put into the pool to catch the larger fish. Fish of all sizes are trapped and professionals have to sort them out according to size and color. Because Gulf has such a large farm to manage, individual observation of each pool is impossible, so pools are scheduled months in advance to be emptied and the fishes sold from these pools represent everything in the pool. For this reason Gulf has the least expensive fish . . . not the biggest ones!

After the fish are trapped and sorted they are put into holding vats where they are treated for a few days to rid them of any disease and to acclimate

them to smaller surroundings. They are then shipped directly to pet shops all over the world. Any pet shop can buy from Gulf directly. Gulf does not sell to individuals and will not answer any letters from individual hobbyists . . . they just don't have the manpower available.

Inside the 40,000 square feet of buildings, Gulf raises 2,000,000 fish per year. Mostly egglayers are raised inside during the winter; in the summer, the egglayers are spawned inside and outside as well. Spawning is done in small plastic tanks as well as regular glass aquariums. Such species as zebra danios, pearl danios, *Brachydanio frankei*, bettas, black tetras, *Megalomphodus*, angels, ghost convicts, oscars, kissing gouramis and all the other gouramis are just some of the more than 60 varieties of egglayers raised regularly at Gulf fish farms. Gulf has about 5,000 aquariums in which imports are maintained and breeders conditioned.

While I cannot extend an invitation to all to visit the farm because we don't have enough people to show you around, any pet shop owner can visit with as many of HIS customers as he wants to bring along. Just write or call for an appointment: Contact Mr. Dwain Meredith, General Manager, Gulf Fish Farms, Inc., P.O. Box 817, Palmetto, Florida, or call (813) 722-4575. The farm is closed weekends and only the breeders and maintenance crews are normally available then, so please don't plan on visiting the farm on a weekend.

Contest Winners



(Landscape) Harold Riddle, Long Branch, New Jersey
(Closeup) Joseph M. Bellantoni, Port Chester, New York



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