July, 1968

tropical fish hobbyist

DOMESTIC 35¢ /British Isles 2/6

..use of synthetic sea salts
..new fancy black swordtails

tropical fish hobbyist

Vol. XVI, July, 1968 (#149) No. 11

contents

Dr. Herbert R. Axelrod
President, Executive Editor
William Vorderwinkler
Publisher Emeritus
J. M. Bellanca
Managing Editor
Dr. Leonard P. Schultz
Advisory Editor
Dr. A. Viggo W. Schultz
Translations Editor
Warren W. Howlett
Art Director
Sam Seidner
Production Manager

features

Bettaphile - 21, Mail Call - 69, Guppy Corner - 79, Salts From The Seven Seas - 81.

cover

Have you heard the story about the young guy who walked hesitantly into a pawnshop, clutching a paper bag in his hand. Nervously, he said to the shopkeeper, "I have 6 **diamonds** that I want to hock. How much will you give me?" "What do you mean . . . how much do I want to give you? I've got to look at them first," shouted the close owner. Then the young man slowly opened the paper bag and even more cautiously pulled out . . . a plastic bag which contained water and . . . six small shimmering fish. Upon seeing the contents of the paper bag the shopkeeper exclaimed, "Oh a wise guy, uh! You think you're a practical joker, uh! Well, I'll show you . . . I'm one up on you; I'm gonna buy your six called **diamonds**. You see wise guy, I'm a tropical fish hobbyist and I immediately recognized those fish as being **Moenkhausia pittieri**, the **diamond** tetra!" The young man's face lit up with a huge smile. "Sure, I knew you were an amateur aquarist all along—my fish society gave me your name as a potential prospective buyer of good private tropical fish stock. Only they warned me that you might try and cut my asking price, so that's why I thought I would make this extra-special sales pitch. Forgive me if I seemed overly dramatic, but I really love these **diamond** tetras, and to me they are more beautiful than real **diamonds**. I'm asking $2.50 for each fish—they're in top-top shape because, I've spent money and time keeping them, and feeding them properly so that they would be healthy. Now that I'm successfully breeding them, I have extra specimens that I can sell." "I'm in agreement with you, too", said the shopkeeper. "They're beauties. I learned a long time ago that when I bought some fish because the price was cheap, I ended up with sick, bye-bye fish. It doesn't pay to look for bargains when you're buying fishes. You **indeed** I learned my lesson a long time ago . . . now let's see . . . you said $2.50 a piece . . . hmmmm . . . how would you like this used pocket transistor radio . . . ?" Some people never really learn. Anyway, our cover is the stunning **Moenkhausia pittieri**.
May, June, July issues of TFH designed by J. M. Bellanca.

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

35c per copy in the U. S. 35c per copy in Canada or Europe. $3.50 for 12 issue subscription in U.S. Add 60c per year for foreign subscriptions. Index available in every 12th issue.

In England and the western Sterling area Tropical Fish Hobbyist magazine and T.F.H. Books are distributed exclusively through T.F.H. Publications (London) Ltd., 13 Nutley Lane, Reigate, Surrey England. All subscriptions and inquiries should be sent directly to them.

Second Class Postage Paid at Jersey City, New Jersey. Published monthly by T.F.H. Publications, Inc. at 245 Cornelison Avenue, Jersey City, N. J.

editorial

Keeping tropical fish is so much like the rest of life. It is an almost constant fight to guess what you must do now so something will (or will not) happen later.

I suppose I learned a long time ago, thanks to my dear Evelyn, that women, racehorses and fish are much smarter than I am (and it is the rare man who knows his limitations).

But applying this wisdom to tropical fish is another question. Thirty years ago the challenge of an aquarium was to keep the fish alive. There were no heaters that were safe, practical and inexpensive. There were few pumps that were quiet and reliable. And the only fishes available were those which could be easily bred, or which could tolerate a long ocean voyage of a month or so. Almost all the rare fishes were brought in from foreign lands by sailors who had small tanks in their rooms on board ship and who discovered that they could make some extra money by selling small colorful fish to petshop owners in their next port of call. Thus Hamburg, Germany, and New York became the tropical fish centers.

The lure of the aquarium today is in breeding fishes, for certainly there is no great challenge in keeping them alive anymore. To successfully propagate aquarium fish requires much less skill today than just keeping them alive yesterday. To help the amateur fishbreeder, this magazine will publish a detailed, fully illustrated article on breeding one of the more common aquarium fish every issue. If a photographer can get fish to breed in front of a lens in a special photo tank, then you should be able to create new life without having the added problem of having to record it photographically.

Herbert R. Axelrod

Fancy Black Swordtails

The tournament crowds at King Arthur's Court are whispering amongst themselves, "Who is the **Black Knight** with ready sword awaiting to joust for Lady Gwenn's hand!" Why it's none other than our old friend . . . **Xiphophorus helleri** in another form-variation accomplished by Dr. Joanne Norton who has been tireless in her efforts to give the aquarium world some splashing new, smashing new, swordtail creations. Dr. Norton has recently experimented further with crossings of various strains of **X. helleri**; these Black Knights in shining armor are the proud results. And what is amazing is that the hobbyist can pick up where Dr. Norton left off, thereby refining, streamlining, and maybe increasing finnage size.

Fancy Black Swordtails

Very important in the development of these startlingly black fancy swordtails is the selection of the correct female **Xiphophorus helleri**; a variety of crossings are possible using different females. The lovely red lady swordtail (below) possesses ultra-finnage, and was Dr. Norton's choice original specimen in the first crossing of a red hifin, lyretail female with an ordinary black male. A gorgeous black lyretail female (above) was used in a crossing with black hifin male to produce the second generation black swordtails. Without a doubt our swordtail society now has some sharp new members.
Photos by Dr. Joanne Norton.

BY DR. JOANNE NORTON

Hi-fin swordtails, which became available about 1960, have been developed in most of the colors found in ordinary swordtails. Also, numerous colors of the lyretail sword, a later introduction, now exist. However, black hi-fin swordtails and black lyretail swords have not become readily available. In fact, I have not seen either of these listed by wholesalers.

In November, 1963, I read an article which described a black hi-fin swordtail that was developed by Larry and Eric Nishida of Hawaii. The author of that article called this black swordtail the "Nishida Helleri". He had four of these fish. They were 8 months old, and he thought that he had two males and two females. However, judging from the photographs and information that he gave, I do not think he had any males. The two fish that the author thought were males did not have gonopodium-shaped anal fins or swords on their tails, but had an elongated type of anal fin that was a little over $\frac{1}{2}$ inch long, having a pointed extension about $\frac{1}{4}$ inch long. I have observed this elongated type of anal fin in some swordtail females, as well as in some hi-fin platy females and have evidence that this is an inherited variation of the anal fin. The elongation of this type of anal fin is even more marked in some female hi-fin lyretail swords. Such a fish now swims in one of my tanks; this brick red hi-fin lyretail female, with an anal fin over an inch long, produced many young in several broods. Perhaps the two fish that the author of the article mentioned above thought were males were actually females with elongated anal fins. Another possibility is that they were "mules", sterile swordtails that develop female-shaped bodies and gonopodium-shaped final fins. Whatever the case, it appears unlikely that he had any black males.

I obtained fancy-finned black swordtails from crosses of red females, both lyretails and hi-fin lyretails, with ordinary black males. A red lyretail female mated to an ordinary black male produced 50 percent black and 50 percent non-black offspring, some of each color being lyretails. A red hi-fin lyretail female mated to an ordinary black male also produced 50 percent black offspring, including some each of low-fin, hi-fin, lyretail, and hi-fin lyretail. In this first generation of fancy-finned black swordtails there were more females than males. Some of the blacks have clear fins. About half of the blacks have red dorsal and tail fins, the intensity of red varying among individuals. The F_1, or first-generation, fish kept for breeders were the blacks with the deepest red fin color.

The second generation of black swordtails came from a black lyretail female crossed with a black hi-fin male. Since hi-fin is due to a dominant genetic factor (H) carried by the F_1 male and the lyretail character is due to another dominant genetic factor (L) carried by the F_1 female, the second generation included some black hi-fins, low-fins, lyretails, and hi-fin lyretails. Some of the F_2, or second generation, now 2 months old, have deeper red fin color than that of their parents. The next step will be to use

for breeders these F_2 blacks with the best red fin color.

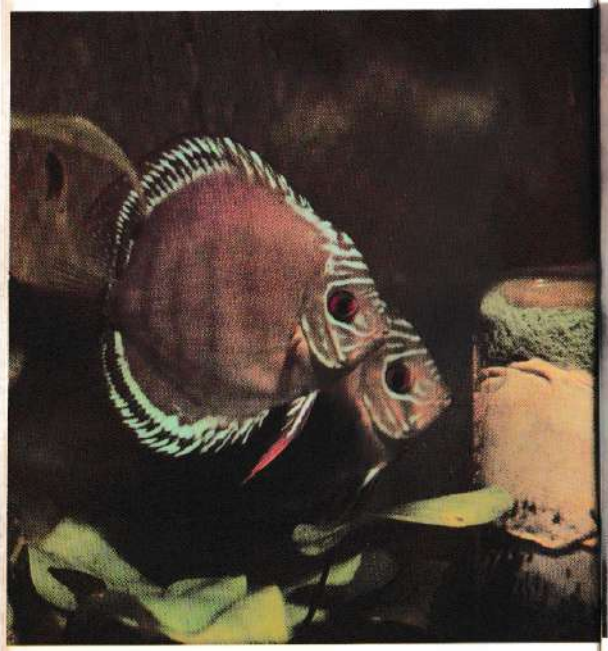
As with other strains of lyretail swords, black lyretails have tail variations. Some have one or more extra prongs on the tail. One fish had a tail with five or six thread-like extensions of equal length, appearing like the teeth of a comb. A few individuals have much of the tail filled in, resulting in a veil-tail. Lyretail swords' dorsal fins also vary among individuals, some being higher and having a thread-like extension. But the dorsal fin of a hi-fin lyretail is considerably larger than that of a lyretail sword.

Fancy black swordtails may be obtained from lyretail, hi-fin or hi-fin lyretail females, as all of these can be fertile. Since the fertility or breeding ability of lyretail and hi-fin lyretail males is in question, it is advisable to use either hi-fin or ordinary red-finned black males. The kinds of offspring from the possible types of crosses are:

1. Low-fin female X hi-fin male: hi-fins, low fins.
2. Hi-fin female X hi-fin male: hi-fins, low-fins.
3. Hi-fin female X low-fin male: hi-fins, low-fins.
4. Lyretail female X low-fin male: lyretails, low-fins.
5. Lyretail female X hi-fin male: lyretails, hi-fins, hi-fin lyretails, low-fins.
6. Hi-fin lyretail female X low-fin male: hi-fins, lyretails, hi-fin lyretails, low-fins.
7. Hi-fin lyretail female X hi-fin male: hi-fins, lyretails, hi-fin lyretails, low-fins.

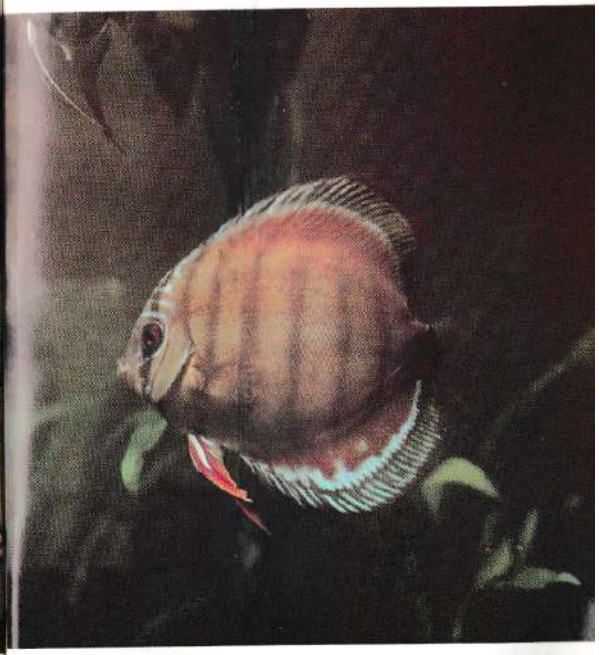
Fancy-finned black swordtails have a blue iridescent sheen like that of ordinary black swordtails. The color of red-finned black swordtails is beautiful even in fish with ordinary fins. In black hi-fins, lyretails, and hi-fin lyretails, the larger fins enhance the effect of this red-black color contrast, resulting in swordtails that are even more colorful and graceful.

At breeding time the behavior of **Symphysodon aequifasciata axelrodi** requires special consideration on the part of the aquarist: the discus should be given complete privacy and should not be disturbed, for they have become extra-sensitive to everything within their immediate environment. This sensitivity is a **mechanism** for protecting the eggs and young from any possible outside interference and harm. Photo by Taborsky.



Another Viewpoint on Breeding Discus

Within the tropical fish hobbyist's realm there are many varied approaches to the breeding of this superb species **Symphysodon aequifasciata axelrodi**; some are more successful than others, and there are those so-called formulas that don't work at all. But there definitely do exist some common sense rules which will definitely assist in facilitating breeding a kind of **systematics** of discus breeding. Photo by Jiri Taborsky.



BY HEINZ LINDNER HOHENSTEIN-ERNSTTHAL, GERMANY

For 40 years I have been engaged in breeding aquarium fishes. In all of this time my hobby has never let go its hold on me, and I do not intend ever to give up this spare-time occupation. I have read with interest articles in this magazine which give hobbyists much valuable information. I, too, would like to offer readers the benefit of my experience.

I have been working with discus for the past 12 years. In all these years I have had some setbacks and staggering losses. Often I was tempted to forsake these fish. But like so many others who have even once kept and bred discus, I could not return to other, more mundane, fishes.

I think I can safely say that the main fault in breeding discus today is the present state of our knowledge or, rather, our lack of it. As for what you should know, the following five factors pretty well cover the problem:

1. The conditions under which these fish are kept are very important. These should be brought as nearly as possible to those found in the Amazon River before spawning takes place. This would mean a large and tall tank with naturally soft, acid water (a pH value of 3.0 to 5.5). The biological balance of the aquarium should not be disturbed either by the addition of substances or their removal by filtration. I have gotten many letters on this, some of them from foreign lands. The sum and substance of these are that the writers' discus have become acclimated to harder water. They eat well, spawn, and at times even raise their young. Assuming that the pH readings given are correct, it can be seen that over a period of years, discus have acclimated themselves to a variety of water conditions. In spite of this, a successful breeding is dependent on good biological breeding conditions. And I believe that the best conditions you can provide are those of the natural habitat.

Acidification of the water by filtration through peat moss, or artificial softening by the use of a resin or other softening agent is not advisable. This is because in these cases the already slightly acid water gets an exchange of hydrogen ions for metallic ions, a chemical reaction which would have a damaging effect on the adults, eggs, or youngsters.

2. Feeding is an important factor which could have many consequences. Discus which are being raised with a view to breeding them should be fed sensibly, abundantly, and in great variety. For safety, all foods should be warmed before use, or else we may be faced with chilling, which frequently leads to discus losses.

In Germany the basic foods are well-rinsed tubifex worms and daphnia. In addition there are all sorts of fly larvae as well as white worms. *Gammarus* are accepted with especial eagerness. From the accounts of Dr. Sioli, a well known Brazilian scientist, the basic nourishment of discus in their native waters consists of small ostracods, a species of which he discovered in the Amazon, which are closely related to our *Gammarus*. The more varied the discus diet, the greater the chances of raising any successful spawning.

The reason for this is that the baby discus, from the time they hatch until the time when they are no longer dependent upon their parents, eat only the parental secretion. The quality of this secretion is determined by the quality of the food given to the parents.

Experiments with vitamin feedings, as well as the addition of natural and sex hormones and other water-soluble hormones to the parents' tanks brought no positive results to myself and my colleagues, and resulted in the loss of many breeders.

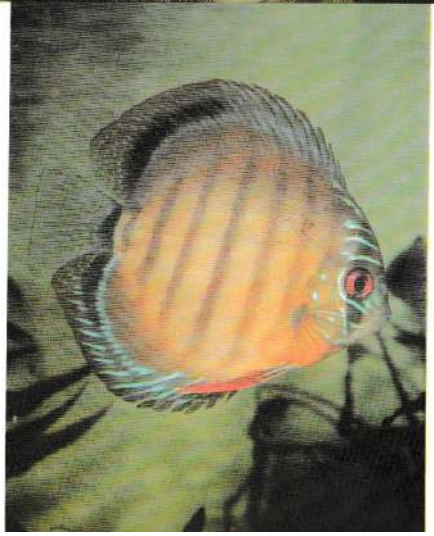
3. Water temperature is the third factor. In the waters where the *Symphysodon* species are found there are some natural hybrids as well as various subspecies and mutations. There are references made to black, yellow, and red varieties. There has even been a report of the capture of a dwarf form that is 2½ inches long at maturity. Whether this is true or not remains to be seen. One thing, though, seems certain: they all need the same or very similar water conditions.

The temperature of the Amazon River, the natural habitat of the discus, is between 85 and 88° F. These we may assume to be the correct breeding temperatures. Of course, there have been spawnings at lower temperatures, but here we can figure on infections, particularly ich and parasitic diseases of the stomach and intestinal tract which could result in the slow-but-sure death of the fish. Dropsy also occurs among discus, often following a chill. All of these infections which can befall a fish weakened by chilling must then be controlled by a gradual boosting, over a period of a week, to temperatures between 95 and 104° F. Combined with stronger aeration and tetracycline this treatment has an excellent therapeutic effect, working over a very broad spectrum, and in almost all cases leading to complete recovery or a visible improvement. In addition, there have been attempts for some time at treating these ailments with malachite green. Much remains to be done, however, before the effectiveness of treatment of discus with this drug can be reported with any accuracy.

4. Selection of breeding pairs is especially important with discus. When discus have been inbred for generations the tendency is for them to become always smaller, less colorful, and more sensitive to disease. The tendency toward brood care also often is lost. Hybrids, on the other hand, are sometimes very quick-growing, more ready to eat, healthy, and willing to take care of their future eggs and fry. For instance, a Heckel discus hybrid female was mated to a pure Heckel discus male. While the female had the youngsters feeding from her body, she took care of a second batch of eggs. Also, this same pair once accepted and raised the young from another pair of discus that did not get along. It is, therefore, always a good thing for discus fanciers to exchange fish among themselves to keep the strain fresh. For this purpose I took from a friend specimens of *Symphysodon discus* Heckel. Acclimation difficulties accounted for the death of two of these. As has been men-

Continued on Page 84

1



2

Indicative of the many "moods" of discus behavior are the many different color changes that discus will exhibit; you might almost say that they express themselves with color. Of course the work and research is in determining what these various color changes signify. Most of our readers who write to us about discus are concerned with the quick disappearance and reappearance of the dark brown color bars that **Symphysodon aequifasciata axelrodi** possess. The three magnificent color photographs on these pages are examples of only a few color expressions of this particular species. If you are a discus fancier, you've probably seen many more of these discus **color happenings** that are clues to understanding the four species of the Symphysodon genus. Photos 1 and 2 by Taborsky. Photo 3 by Horst Mueller.

3

Concerning Dropsy

BY ROBERT A. SHAURIS

Of the many fish diseases that confront the hobbyist, perhaps the most perplexing is dropsy. One of the internal symptoms of this disease is the accumulation of a liquid substance in the tissues of one or more of the internal organs. The disease can be recognized in a fish by the swelling of the victim's abdomen region. Such swelling can reach a point at which the fish appears ready to burst. However, he usually dies due to great amounts of pressure long before actually exploding.

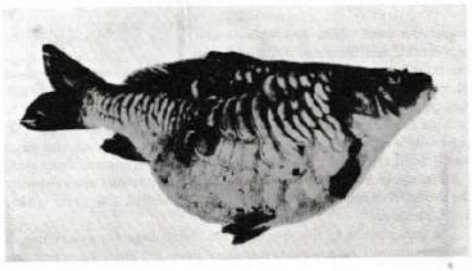
When an infected fish was dissected and examined, it was found that the intestines were inflamed and the liver showed some damaged areas. After extracting the liquid in the affected areas, it could be seen to be yellow in color and rather dense. Also, it had a disagreeable odor.

In general, dropsy can be regarded as a non-contagious disease which singles out an individual specimen as a victim. However, it is a fact that if the liquid should spread, an epidemic may follow. Once I noticed a female guppy that was infected with dropsy. I immediately removed her to a small tank. I also took out four other females and one male and placed them in another small tank. With a syringe, I extracted some liquid from the infected female. The amount was a little less than 1 cc. This fluid was then injected into the water of the tank containing the other five guppies. Within a week's time, three of these guppies began to show signs of distress. After 2 more days the fish had begun to swell.

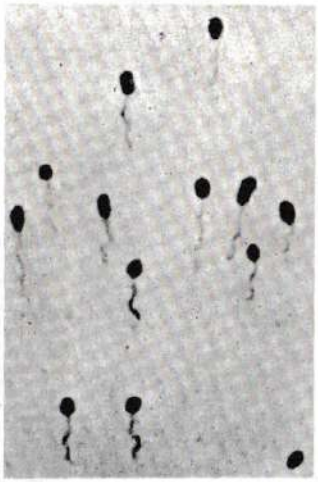
The exact nature of dropsy was described by Dr. Wilhelm Schaperclaus. He stated that the cause of dropsy is a bacterium, *Chromobacterium punctatum* (also called *Pseudomonas punctata*). This bacterium is approximately 1 to 1½ microns long, is rod shaped, and has a single tail-like flagellum.

As mentioned before, dropsy is contagious only if liquid from an infected fish is allowed to spread through the water. In the aquarium this happens when a dropsical fish dies and begins to decay or is picked at by its tankmates.

As for a treatment for dropsy, I know of no direct chemical method that can be relied upon completely. However, chloromycetin or aureomycin in strengths of 40 to 60 mgs/U.S. gallon of water have been recommended. Since chemicals prove not to be too effective, I had tried the following method and gotten good results: Remove the fish from the community tank, and place it in a container of water into which some chlorotone (a sedative) has been added. When the fish becomes completely inactive, remove it from the solution, and place it on a wet gauze pad. Now, with the use of a hypodermic with a short, thin needle, you may proceed to drain the liquid. Insert the needle carefully from a point just in front of the anus and pointed



As can be seen from these photographs these fishes have developed the symptoms of body-swelling and scale protrusion, symptoms supposedly manifestations of an infection of fishes known as **dropsy.** The lower photograph exhibits a fish in the late stages of this disease—the scale protrusion is quite severe. Diagnosis of course at this late stage is easy, and too late to be of any help to the fish. The trick is to be able to recognize and be aware of the fish's illness, when initially infected.



These innocent looking little spots are really big trouble to our aquarium fishes for they are in reality bacteria, **Pseudomonas punctata,** which bring about secondary infections to fishes who are suffering from dropsy.

toward the head. Now pull back slowly on the small plunger of the hypodermic, and the liquid will drain into it.

Next it is best to place the fish in a bath of a 2% salt solution for about 20 minutes. During this time the fish will regain consciousness. The fish may then be returned to the aquarium; however, for added protection, a bath in either aureomycin or chloromycetin in the amount mentioned previously is highly recommended. Let the fish bathe in this solution for at least ½ hour, after which the fish may be returned to the community tank.

In using my method, it is most important to be careful when inserting the needle. Damage to the vital organs would prove fatal, so never jab the fish haphazardly.

The cure effected by this treatment has always been permanent, and of the many fishes I have treated, only three have died from the experience.

BettaPhile

Frederick J. Kerr

Some months ago this column pledged itself to the support of any group which seemed to have the potential of becoming a national organization devoted to the improvement of the betta. Such an organization was in existence, unknown to the writer, at the time of that writing. The name of the group is the International Betta Congress.

According to the IBC's bulletin, the history of the congress may be divided into three parts. The group finds its origin in the TIFAS convention held in Milwaukee in May of 1963. Here a very impressive betta show was held largely through the efforts of betta fancier Bunny Lorbiecki. Two years later the Cleveland Betta Associates held their first all-betta show. An important feature of this show was a meeting of betta fanciers called for the purpose of starting a national or international betta society. The group agreed that their initial efforts would be devoted to improving breeding methods, correlating standards, show rules, and color classifications. In 1967 a group of fanciers, called the International Betta Congress, held its first annual convention under the sponsorship of the Splendid Betta Fanciers of Milwaukee. This meeting was held on the Labor Day weekend of 1967 in Waukesha, Wisconsin. Over two hundred bettas were shown with the grand champion going to John Gallagher of New York City.

At this convention the IBC elected officers: Stan Smith, Grove City, Ohio, President; George Torres, Bronx, New York, Vice President; Sharen Chappell, St. Paul, Minnesota, Secretary. Aquarists interested in joining this organization and receiving the several benefits of membership should send $5.00 in check or money order to Treasurer, Bob Lorbiecki, 1845A North Pulaski St., Milwaukee, Wisconsin 53202.

The IBC is developing a slide program aimed at clarifying color classes and standards as proposed for the upcoming IBC betta shows. When completed the program will become available on loan to aquarium societies and members of the IBC. Additionally, the IBC publishes an informative bulletin devoted to information on the genetics and husbandry of the betta.

The Congress's second annual convention will be held in Columbus, Ohio June 21–23, 1968 at the Imperial House North Motor Inn. The group hopes for an entry of about 900 bettas in the shows upcoming. Those interested in entry should contact show chairman George E. Landis, 3687 Bethel Road, Columbus, Ohio 43221.

Betta Species

Q. 1. Can you tell me where I can get *Betta bellica*? I am anxious to get hold of them. Petshops and aquariums use them to feed meat eating fish.

2. How can I get information on *Betta fasciata, B. picta, B. pugnax* and *B. taeniata*?

B. Davis
Glen Burnie, Maryland

A. *1. I have no idea where any of the species bettas you mention may be obtained. Dr. Gene Lucas of Drake University is importing wild* B. splendens. *Hopefully some of the other species might be included accidentally. In any*

case these would not be available to aquarists for some time. I would be very surprised if dealers were feeding B. bellica *to other fishes because I don't believe this species has been imported in quantities.*

2. There are some rather reliable articles on B. brederi (=B. pugnax) *in the May 1953 issue of TFH. The March 1960 issue of TFH contains an article about* B. taeniata.

Feeding problems

Q. 1. I have bettas 12-months old which I raised. These fish have not reached the size of the parents. I feed frozen brine shrimp and prepared foods. Any suggestions?

2. What is the reason for the high mortality rate among my fry? I have enclosed my tanks and keep the temperature constant. I use commercial infusoria sold in tubes and baby brine shrimp, but I have managed to raise less than a dozen bettas.

George F. Robinson Jr.
Washington, D.C.

A. *In my opinion the answer to both of your questions is food. For your adults, try supplementing the diet with emulsified beef heart which should be available in your area. The fry are a little bigger problem. A proper infusoria culture is essential. One breeder uses a pinch of yellow cornmeal in a gallon of water from an established aquarium. It is recommended that this water contain settlings from the bottom. This is said to produce a good culture in 24 hours. Another method used it, the same type of water with the addition of about a dozen pellets of rabbit food.*

Raising Fry

Q. 1. How can you tell if your infusoria culture is rich enough?

2. When can I raise the water level in the tank?

3. How should the level of the water be raised, by inches or all at once?

Sheila Scott
Alameda, California

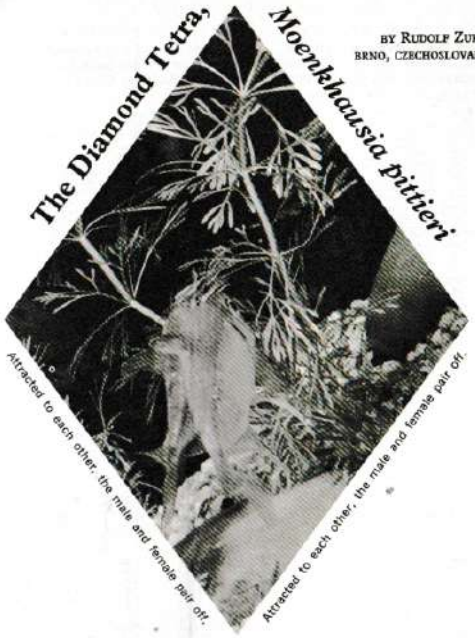
A. *1. The culture should be clear and preferably odorless. Aeration helps here. To check the richness of the culture, place a drop on a piece of glass or clear plastic. Hold this over a dark background and check with a 10-50 power magnifying glass. Paramecia are easily visible as moving flecks. Experience will soon tell you when a drop is concentrated enough to feed.*

2. The primary reason for shallow water is to allow for added water when feeding infusoria. Another reason is to give the male a break when he is retrieving fallen fry.

3. It is best to add water by inches.

The Diamond Tetra, *Moenkhausia pittieri*

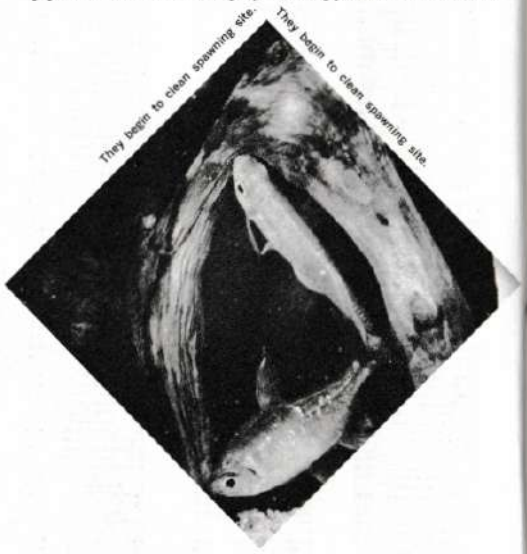
BY RUDOLF ZUKAL
BRNO, CZECHOSLOVAKIA



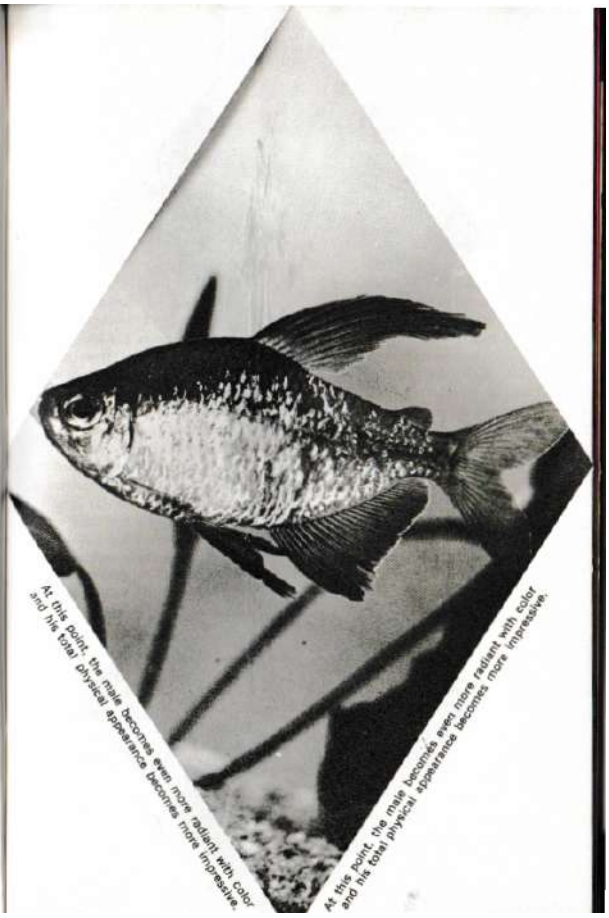
It would certainly be interesting to find out which species and kinds of fishes are kept most by fanciers. I personally am convinced that the general number of really popular tropicals is not great. I have often seen that in petshops the same species of fishes are always offered and bought. It would really be hard to play umpire in deciding which fishes should be sold, for different people have different tastes. Each species shows its own distinctive beauty or curious and interesting behavior that might endear it to a particular hobbyist. But despite the important role that beauty plays in fish popularity, the gorgeous diamond tetra is rarely seen in the tanks of fanciers.

Why? Could the cause be the light coloring of the fish? Is red the only hue that is favored by popular demand? Or could it be that in the petshops the fish is offered under unfavorable lighting? I cannot think of another explanation.

When I watch the species in my densely planted tank, I know that the popular name of the fish was rightly and fittingly chosen. The sides of the



fish's body are specked with metallic green dots. The fins are gray and translucent with white edges. The upper part of the iris of the eyes is red. The male has more strongly developed fins, especially the dorsal. Keeping the fish poses no special problems. Use a medium-sized, well planted tank. The water should be 70° F., semi-hard, and slightly acid. The fish are peace-loving and should be kept in schools of their own species or in



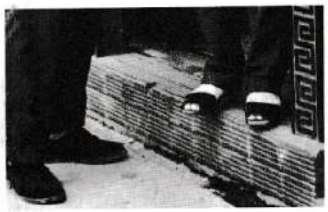
communities with other Characins, because otherwise they turn shy. They come from Venezuela (Lake Valencia), Rio Bue, and Rio Tiquirita. The first importations came to Europe in 1932.

The fish may reach a length of 2½ inches. The males stage beautiful but harmless battles. The species is not choosy as to feeding, but one has to offer them nutritious live, frozen, or freeze-dried foods in sufficient quantities.

Spawning the species is reported to be difficult, but if a pair is well matched, reproduction offers no difficulties. I prepared a 5-gallon all-glass tank, taking part of the water from the fish's former aquarium and one third tap water. The water mixture showed the following characteristics: 150 ppm hardness and a pH value of 6.8. The temperature was raised to 84° F. A few days before this, I had watched a beautiful young pair flirt repeatedly. I now placed this pair in the all-glass tank in the evening. The fish were very shy and hid among the plant thickets. It took me a few days to find out and correct my great mistake and to place the tank with the breeding pair in a spot where the light was subdued. Very soon the male, followed by the female, made a tour of inspection around the tank. Then the male spread his beautiful fins and lured the female into the plant thickets. During this courting and impressing process, the female was often chased. The chase was frequently quite vigorous. Then things came to the point where the male followed the female into the plants. Shortly before reaching the plant chosen for spawning, the fish pressed together. Then there was a lightning swift turnabout, and the fish separated.

What had happened during this last moment? Things had gone on quite quickly, but I wished to find out. So I kept quiet and at ease to watch the procedure once again. The male follows the female. There is a quick flirting motion. The fish turn swiftly around each other in the same manner often seen among neon tetras. Now the female follows the male. Without paying attention to the plants, the fish swim towards each other, start a lightning-swift turnabout, and during this turn the eggs are expelled and fertilized. After each encounter, the fish separate. Some 6 to 10 pale yellow eggs measuring about 1.5 mm have been laid. The eggs sink to the bottom or stick in the plants. In all, about 100 eggs are expelled. Since I knew that these fish are roe eaters, I removed the pair after they had spawned.

The fry hatched within about 30 hours and became free swimming on the sixth day. The very shy little fish should be offered small live food. The young grow quickly and are relatively easy to rear.



Fish Lover in Singapore

BY RODNEY JONKLAAS

Sometimes technological progress is the enemy to the picturesque and the romantic. We who live in cities where all the modern buildings look like just a row of children's play blocks, yearn for what the modern architect disdainfully refers to as gingerbread, i.e., little bits of decorations and detailed carvings on the facades. The Orient abounds with the picturesque, since technology and the empty modernistic theories in architecture haven't taken over as yet. Even commuting in the Orient is still not as slick as here in the U.S.A. The vehicle in this photo is only a hopped up version of the old rickshaw. If you have a yearn for the romantic, join us in this TFH issue, in our **Salute to Singapore**, for in these pages you can enjoy the picturesque and after reading, go back to the comforts of your refrigerators, cars, and washing machines.

A heaven-sent opportunity to visit Singapore gave me a chance to go to as many of the Singapore aquarium shops as I could. I was told that there were over 300 of them, and to the dismay of my hosts Johnny Johnson and Jack Fisher, the sea-shell moguls of Malaysia and Singapore, and to the delight of various taxi-drivers, I set about trying to explore all of them. Naturally I failed to achieve this end in the short time at my disposal in between diving expeditions up North in the South China Sea, but I guess I did pretty well anyway.

The fish shops of Singapore are all quite attractive and boast exotic names like South Seas Aquarium, Blue Sea Aquarium (matched by Green Water Aquarium in an area where the water, as a matter of fact, was green due to excessive sunlight and the resulting algae formation), Mayfair

The love of things ornate is expressive of the oriental spirit. It is natural, then, to these beautiful people, to respond to the patterns, myriad colors, and exotic forms of tropical fishes. The Chinese developed the art of keeping fishes within the home. In fact, their experiments with goldfish breeding by now is legendary . . . so much so that in the orient the goldfish, such as this Lionhead, has become a symbol of the occult.

Aquarium, etc. But, of them all, the one that impressed me most was Red Sea Aquarium, one of several hotly competing establishments on Dhoby Ghaut Road close to the Cathay Hotel.

I had learned of Red Sea Aquarium in Ceylon months before I went to Singapore and had also exchanged correspondence with the management. In addition, I had seen some of the fishes exported by this concern. The fishes were splendid, so, naturally, the Red Sea Aquarium took a high place

in my list of things to see. And I was not disappointed. The discus trade mark of Red Sea Aquarium is no phoney "come on." The Red Sea Aquarium boys really do specialize in discus (and other rarities). In fact they breed discus, the Heckel, or red species, not the common browns, in commercial quantities and with great success.

Now this street is saying something. At last the scenery is beginning to feel and look like what we thought the mysterious Orient would be. This is the famous street in Singapore called Dhoby Ghaut—a wondorous mixture of the old and new worlds. If you haven't already noticed, this photo is a charming study in windows—in fact, you can peek into the windows of these quaint little houses. Ah . . . what wonderful old world char . . . hey, who sneaked in those air conditioners while we weren't looking? Get 'em out of here, you're killing our story. Photo by Rodney Jonklaas.

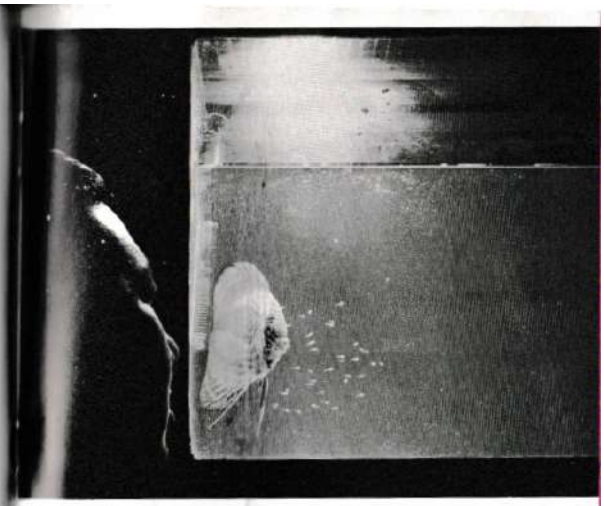
The Red Sea Aquarium has a neat appearance. It faces Dhoby Ghaut Road, and few people can resist at least a glance at the dazzling inmates of the many tanks on view. It was here more than anywhere else that I saw the largest variety of freshwater fishes in Singapore. They included some of the rarest and most costly species. It was here, too, that I was introduced to Gro-Lux fluorescent lighting. I know that Gro-Lux bulbs are available to North American hobbyists, but I had never seen them before. There was a tank crammed full of fishes, including red platies and flame swordtails, and, of course, I fell for these breath-taking livebearers as most everyone does who first sees them under Gro-Lux bulbs. Within a few days of returning to Ceylon, I had Gro-Lux tubes flown in from Amsterdam at great cost. When I installed them and showed the results to some of our local fanciers, their eyes nearly popped out of their sockets.

Red Sea Aquarium had several large pairs of Heckel discus on sale, and also piranhas, electric eels, and a marvellous plecostomus-type of fish with a deep indigo color with white, spotted, sail-like dorsal. In addition there were many, many freshwater tropicals I had never seen alive before. I was enchanted with the place and was soon a firm friend of the boss, Mr. Tan, who is now a valued client of mine. Tan runs his establishment with typical Chinese thoroughness, hard work, neatness, and business sense. The place is spotlessly clean and always a hive of activity. No diseased or dead fishes, no foul water, no mess. Such a contrast to some other places I had seen! Customers rushed in and out, and there was always brisk business. Vast numbers of plastic bags containing daphnia and mosquito larvae were sold to customers who stopped their cars, tooted their horns, and drove away with their purchase to feed their pets. I saw a cycle-rickshaw pull up literally full of plastic bags filled with live fishes delivered from a nearby farm. I have seen fishes travel in vans, trains, aircraft, ships, motor-cycles, ordinary bicycles, and even push-carts before, but a cycle-rickshaw fish carrier was something new, so I had to take a picture!

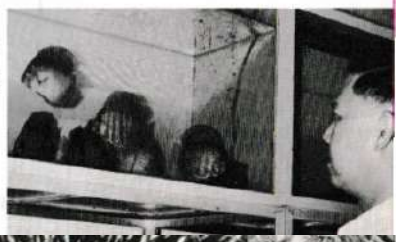
I paid many visits to my friend Tan's lovely shop, and there was seldom anything I wanted that he could not get for me. I placed huge orders for all the exciting fishes I had seen, and subsequently they were shipped to me in Ceylon to my great satisfaction. In return I shipped Mr. Tan monos and black ruby barbs for which there is a constant demand in Singapore. Especially popular there are *Monodactylus argenteus* which are sold by the thousands every week.

Tan's shop always contained at least 50 different species of popular aquarium fishes. Many of these were bred in Hong Kong and shipped to Singapore; these fishes included beautiful varieties of fancy goldfish. The best selling baby goldfish, said Tan, come from Japan. One day I saw a tankful and was very impressed. They were Japanese fantails—only an inch long in body-size, but perfectly proportioned, and brilliantly colored, and

Continued on Page 52



Do you want to see and hear a real love story? Well . . . Tan Buck Yang of Singapore is so fascinated with **Symphysodon discus** (Heckel)—the red discus—that he has spent a small fortune in time and money to become an expert with this species. He is supposedly, the authority in Singapore when it comes to breeding this difficult species. Moral to this is: better to spend small fortune on discus than to spend small fortune on cookies.
Photo by Rodney Jonklaas.



"Confuscius sey, that man who desires to talk to discus must speak right language." Since Tan Buck Yang is a successful breeder of this species, and he speaks Chinese . . . maybe Chinese is the lingo that discus best understand.
Photo by Rodney Jonklaas

If an aquarist were granted just one wish, what more could he ask for than a hazy, lazy afternoon under swaying palms, netting Oriental aquatic species, such as Chocolate gouramies which really abound in this winding stream outside Singapore.

they had fine finnage. They were also very fairly priced, and, naturally, they sold like hotcakes. The *ranireni* I saw here were fine, large, healthy specimens bred and raised in Singapore. *Jordanella floridae* were there aplenty, and there were also many species of *Corydoras*. From Bangkok, Tan imports redtailed black sharks (*Labeo bicolor*), tri-color sharks (*Balantiocheilus*), and flying foxes (*Epalzeorhynchus*), all of which sell well. Neons come in from Hong Kong, where they are bred by the hundred-thousands, and cardinals come in from Amsterdam.

Tan also stocks a huge variety of fancy imported foods, aerators, filters, and aquarium accessories. The plastic SCUBA diver air-releaser was a hot item at the time I was there. I had never seen such a wealth of aquarium accessories before in Ceylon or in India, so I spent hours examining everything.

Naturally Tan is an extremely busy man. His shop not only handles local sales and purchases but also controls his growing export business.

As and when he had time, Tan would take me out to see other establishments. An unforgettable experience was a visit to the farm of Singapore's famous lyretail molly tycoon, Mr. Ong. The farm is in a less populated part of the island and therefore had no electric power. Shallow concrete ponds neatly built in rows accommodated thousands of choice livebearers, mainly lyretails. There were also fine swordtails and a few cichlids. I estimated that at least 10,000 fishes a month were born and raised to maturity here. The whole farm occupied less than an acre. Ong uses galvanized metal mesh cages in the centre of each pond for his breeding stock. The babies swim out and grow in the ponds and are harvested from time to time . . . simple, fool-proof, labor-saving, and inexpensive!

I also visited the goldfish centre and was shown some of the finest round-bodied fantails I have ever seen. Naturally I wanted some and was promised a few. In 2 or 3 weeks some real beauties arrived in Ceylon and made me the envy of all my friends.

But the best thing about my association with Red Sea Aquarium happened later. A few days before I was due to return to Ceylon, Tan invited me to visit his brother's home, which was not very far from Red Sea Aquarium. I had often met Tan's brother, Buck, who did not speak very much but was obviously a "dark horse" in tropical fish breeding techniques. I was told that he was the only successful breeder of Heckel discus in Singapore, and that, of course, is really something. I could hardly wait to see his place. It was a neat small home with a well locked gate. Buck's charming wife opened the gate for us and I was ushered in graciously. In a few seconds I saw an unforgettable sight. One of Buck's bedrooms had been converted into a fishroom (something which is unheard of in Ceylon and which, if done there, would almost certainly start divorce proceedings). But what a fishroom! There were three rows of tanks set up on angle-iron racks, and the cleanliness of the place was quite amazing. The floors were spotless and polished, and, naturally, I left my shoes at the entrance. The tanks, like the racks, were made of angle iron, and their frames were painted in gold. Each tank was painted and darkened with blue paint on the rear glass. The top row had Heckel discus, mostly in mated breeding pairs, and each tank was fitted with a light, filter, heater-thermostat, and air-line hose. The only decoration in each tank was a beautiful ceramic vase. The discus would obligingly lay their eggs on these and raise their babies in the approved fashion. I saw discus breeding in all stages, eggs being laid and fertilized, babies hatching, babies feeding off the parents' bodies, babies growing independently on brine shrimp and then tubifex, young adults pairing off . . . everything. It was an education in flawless technique, cleanliness, and efficiency which I shall never forget.

Buck told me he buys the wild discus at low prices from South American ships' crews coming into Singapore. How I yearn for similar crews to touch at Colombo, but they never do. He also told me something vitally important: that occasionally he would wean the baby discus from their parents by giving them a liquid fry food. I do not breed discus myself, but it would be interesting to find out whether others more fortunate can duplicate this technique of Buck's.

Other fishes at Buck's place were some breath-taking fancy guppies (the offspring of which are now doing famously here in Ceylon), cardinals, clown loaches, and some rare tetras. This then was Red Sea Aquarium's secret treasure trove.

After seeing Buck's discus, nothing else in the aquarium activity in Singapore really mattered to me. My departure from Singapore was really reluctant, and when I eventually flew back to Colombo, more than anything else, the vision of those gorgeous Heckels was with me more clearly than my memories of all the other tropicals I had seen and admired during my trip.

MAIL CALL

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

Glass Cats

Q. Recently I purchased four glass catfish and I was wondering if you would give me some information on them?

1. Would you please give me some information on them pertaining to food requirements?
2. What is the necessary pH, and their temperature tolerance?
3. What size tank would my fish require, and what size will they grow to?

Pat Lang
Santa Fe, New Mexico

A. *1. Your glassfish* Kryptopterus bicirrhis *should be fed live foods when possible. Daphnia, tubifex worms and white worms will be eaten by them with great gusto. They will also relish feedings of freeze-dried foods such as Miracle's Freeze-Dried Brine Shrimp or Freeze-Dried Daphnia. In the old days of the aquarium hobby you had to go out yourself and collect the troublesome daphnia. Today you can purchase it in handy to use form.*

2. Your Kryptopterus bicirrhis *prefer a slightly alkaline water; a pH of 7.2 or 7.3 should be satisfactory. Tempera-*

ture tolerance is from about 72° to 78°F., using 75° as the happy medium.

3. Since this species will mature to a size of about four inches, at their full grown size they would be properly maintained in a tank of 20 gallon capacity. If you've purchased younger specimens, I would still recommend the 20 gallon tank so that you can raise these fish to the full body proportions possible.

Kryptopterus bicirrhis

Miraculous Fishes

Q. I am not sure that this letter is in the categories normally answered, but I am writing it anyhow.

Two years ago while on vacation on North Carolina's Outer Banks, we had stopped at the National Park's visitor service center at Buxton Lighthouse. I had gone for a walk along the beach when I suddenly came upon a small pool in the sandy beach. I could see small fishes of several types darting about in it. I returned to our car for a large two gallon jug and a small hand net. After checking with park service employees, I returned to the pool and captured nine small fishes. On closer examination, they proved to be mosquitofish! This pool was filled mainly by salt water as the tide came in while I was netting the fish and nearly caught me. Besides, there was stale tidal foam on the surface. The only source of water would have been any fresh water that seeped through the dunes.

When I returned to the pool three days later, it was completely washed full of sand with no fish or water visible. Last year we returned to North Carolina. Out of curiosity I checked the pool. There it was full of mosquitofish again!

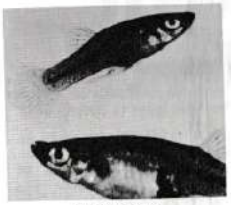
My questions are:

1. Where did the fish come from in the first place?

2. How did they get back in the pool after it was filled in?

I think that your magazine is the best.

Truman Eyler Jr.
Gettysburg, Pa.



Gambusia affinis

A. *The mosquitofishes are a very hardy group of fishes. Gambusia affinis holbrooki can live under a thin sheet of ice all winter. It has even been known to hibernate in the mud during the wintertime. And they can tolerate an extreme temperature range from above freezing to 88°F. Members of the Gambusia genus have been used by many countries as a mosquito control by introducing them into the intermittent bodies of waters such as stagnant pools and marshes which are some of the favorite breeding spots for the aquatic larvae of the mosquito. Their salt tolerance may also be higher than before thought possible. That pool by the ocean may also have had its salt contents diluted with an occasional rainfall.*

Persistent Fungus

Q. I am having quite a problem with a fungus. It rages through my tank for no apparent reason. It begins on the fins and tails, and coats the bodies, then makes a white blob on the eye. It begins and reaches its peak in about one to one and a half days. It hits every fish. It seems to hit the silver dollars first, next the angels and other cichlids and last, the kissing gourami (pink) and catfish. It seems to make a fungus slime that peels off. Could it have any relation to the spots that resembled ick on the silver dollars, that were black instead of white. I don't know why it flares up; it does every 3 or 4 weeks, and I have a loss of fish. I have six tanks and it only occurs in one, a fifty gallon that was quite unpopulated. Until this siege, I had all of seven angels, two scissors, two Geophagus, one firemouth, one red tailed shark, two silver dollars, one sucker cat, and two regular cats. It is quite repulsive and very sad. The poor fish even have it inside their mouths, not to mention their whole outside. They will all look fine in the morning or afternoon and that same very night, they will have the fungus.

Mrs. Thomas Urquhart
Morgantown, West Virginia

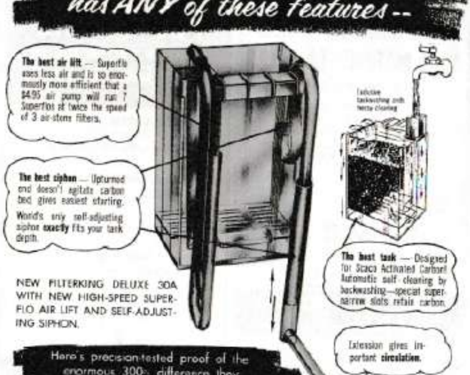
A. *The identification of the disease that affected the fish members of your large tank is at this stage a secondary problem. What you should concern yourself with is the prevention of this disease from happening all over again. And since your letter did not state any data as to your treating the large tank before using for another new fish population, it becomes obvious that this was an important factor contributing to the reoccurrence of the disease. Any aquarium and aquarium equipment, including fish nets, filter boxes, and decorations, should be disinfected after a sickness has taken over in the tank, and fish have died. Diseases which can be controlled with the fishes still in the tank are not the problem under discussion. But certain fungus diseases, where cures are not always certain, and the fishes progressively grow worse to the point of death, these are the kind of diseases which require a tank's treatment, before establishing new fishes in that same tank. Potassium permanganate is excellent for this purpose of disinfecting a tank after everything inside is removed. But as with all chemicals, one must be extremely careful to use just the proper dose. One gram of potassium permanganate to 10 liters of water should suffice. Stir frequently, allowing the solution to stand in the tank 4 or 5 days, adding fresh water later. Any subsequent problem with resulting brown deposits can afterwards be removed with a weak dilute solution of sodium bisulfite.*

Ignorant dealer

Q. I liked your editorial in the September TFH that said hobbyists should appreciate dealers and think you are right. However, how about writing one to the petshop people about knowing what they are selling. So many times I have gone into a shop and asked about a fish or plant in one of the tanks and got an answer like "I don't know", or "I guess it's a ——". For heaven's sake, if you are going to sell something, find out what it is, please.

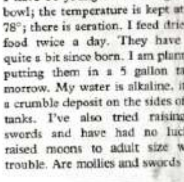
Mrs. Judy Swatkowski,
Chicago, Ill.

A. *Your contention that retailers (and I would apply this to sellers of just about everything, from fishing tackle to washing machines) should know a lot about the products they sell is correct. It makes sense from all angles for dealers to know what they're talking about. But the sad fact is that many retailers . . . even retailers of specialized-interest materials . . . don't know as much as they should; this lack of product knowledge, incidentally, is by no means the exclusive property of pet dealers. As a matter of fact, I believe that many dealers in tropical fishes have a better knowledge of the tropical fish hobby than other retailers have of their fields of specialty. Also, the dealer who answers "I don't know" is a bargain compared to the man who through foolish pride dishes out misinformation in place of an admission that he doesn't know. Besides, you're not completely at the mercy of anyone else for information; you can always buy some good books and become your own expert.*



Mollie Fry

Q. I am desperate. I have tried to raise black and marble mollies babies, and do not have very good luck. When they reach the age of 1½ to 2 weeks they start dying till the whole brood is gone. I have 14 young in a three-gallon fish bowl; the temperature is kept at 76° or 78°; there is aeration. I feed dried baby food twice a day. They have grown quite a bit since born. I am planning on putting them in a 5 gallon tank tomorrow. My water is alkaline, it leaves a crumble deposit on the sides of all my tanks. I've also tried raising baby swords and have had no luck. I've raised moons to adult size with no trouble. Are mollies and swords hard to raise? I asked my dealer about this and she said she has no luck with mollies either and she said a water test kit wasn't necessary because they will live in just about any water. By the way my



water comes from a spring we have. I hope I've given you enough information and hope you will answer this soon, as I am expecting two broods of High Fin Lyretail swords. Is it alright to use an undergravel filter with baby fish. I enjoy your articles very much and can't wait each month for more.

Faye Hale
Wakeman, Ohio

A. *One of the reasons that you are not able to raise your fry to a further stage of development is that 3 gallon fish bowl you are using. An aquarium has more opened top surface area, allowing for a better release and entrance of gases. Also as the fishes grow they require different foods. Newly hatched brine shrimp would benefit your young mollies. If your dealer told you that mollies will live in any kind of water, then that's probably why she has no luck raising mollies either. Mollies need an addition of salt to their water. These fish also need a water that is somewhat hard and on the alkaline side. Yes, an undergravel filter is O.K.*

Show Standards

Q. 1. I purchased a pair of King Cobra guppies. The male has a scarf tail which is black with yellow and white markings. A couple of weeks later, I bought another pair, and this male has a flowing veil tail which is black with white edging. Both males have beautiful body markings. My question is . . . what does an ideal King Cobra look like? I have read everything I can find concerning guppies, but I can't find anything at all on King Cobras. Presently, I am raising 2 broods from these two pairs, and I want to keep my eye open for any resulting exceptional specimens.

2. Concerning German black guppies, what is the ideal description for this charming little fellow? I have been told by several hobbyists that the tails of this fish become ragged with age. But I have a nice male which seems to be an exception to this rule, because his tail is

very well formed. His coloring though, concerns me; his tail is half red and half white with black spots and edging. The body is black with a gray head and red splashes over the pectoral fins. All his other fins are white.

Mrs. Shirley Lynch
Medway, Ohio

A. *1. I would say that there is no set standards for "King Cobra". In a guppy show, the fish are classified according to their color in their tails such as, red, black, yellow, multi, and . . . anything goes. I brought this fish into this country originally from Europe, and gave it away to some breeders in New York area. One called this type of fish, "snakeskin", and the other called it "King Cobra", just to give them good selling names. In Europe this fish is called "leopard strain". Also in a show, fish are judged on their deportment, condition, and the vividness of their colors. It stands to reason, that you will not find much written about this fish in aquarium literature, since this particular strain was only introduced about 3 years ago.*

2. The problem of ragged tails is not exclusive with half-blacks, for I have noticed this problem with other types of aging guppies. You did not give the age of your fish. The most outstanding feature of a half-black is, a dark red tail and dorsal, which is here to attract the eyes of the judges and hobbyists in any show.

Salts From The Seven Seas

By Alfred A. Schultz

Q. I am in the process of setting up a marine aquarium and have a number of questions.

1. Which type of filter system is best for a marine aquarium, an outside filter with glass wool or an under gravel filter?

2. What marine fishes can co-exist with anemones?

3. Must a light be continually illuminating a marine tank?

4. I am planning a trip to the Virgin Islands and would like to bring back a selection of anemones. Is there any customs constraint against this, and will they survive the trip?

Edward Speck, Jr., Arlington, Va.

A. 1. *Why not use both. I do.*

2. *Pacific clown fishes, all of the Amphiprion species.*

3. *No, too much light is harmful to the vision of marine fishes.*

4. *There are no customs restrictions that I know of. I have brought in many bags of fishes that I have collected and never never had any difficulty. The trip is relatively short and your fish should survive the journey. Bring large plastic bags and when you close them, leave plenty of air space.*

Q. When dwarf seahorses are born, should the young be removed and separated from the parents?

Nancy Wolf, Shaker Heights, Ohio

Hippocampus species

A. *They may be left with the parents, they will not harm the young.*

Q. How large do batfishes, *Platax pinnatus* grow and how large an aquarium do I need for them?

William Whitney, Flint, Michigan

A. The largest batfish that I have seen was about two feet from top to bottom and about six inches from head to tail. It was housed in a special fifty gallon high tank. If you can get young specimens they can be started in a twenty gallon high tank.

Q. Is it true that all glass tanks should be used for keeping marine fishes?

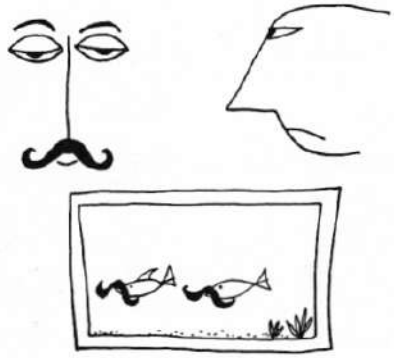
Alexander Zale, Walden, Mass. and D. J. Krametz, Woodbridge, N. J.

A. Marine fishes can be kept in either glass or stainless steel tanks. By using glass tanks you save yourself the trouble of coating all the inside metal parts that may contact the salt water, but once you take the above precautions, you won't have any more trouble. Most of my tanks are of stainless steel construction.

Q. Why are salt water fishes so expensive?

Rick McClure, Akron, Ohio

A. Mostly because salt water fishes do not breed in the hobbyists aquariums and the other reason is that they are difficult to collect and expensive to ship. They come from far away places and must have a lot of room in their containers. All this combines to make the price of salt water fishes high.



" I say old boy, we'll call them " handle-barbs"

Continued from Page 11

tioned in much written work, breedings of two unrelated fish have often resulted in extremely colorful hybrids. We assume that these youngsters get their beauty by developing colors ordinarily found only in wild specimens. In 5 months the black middle bar as well as the blue horizontal stripes were readily visible on the body. The youngsters impressed me with an enormous appetite and quick growth, especially when some fresh water was added every day. In 7 to 9 months full color was attained.

It can be said that discus do not take long to attain sexual maturity from the time they get their full colors. On the other hand, we have had fish that did not reach their full growth until their fifth spawning. My largest specimens attained a size of 7 inches. (As discus become older and larger, however, their colors fade noticeably.) The oldest fish from which we have gotten spawnings were 4 years old.

5. The location of the aquarium is very important. It must be in such a spot that there are no disturbing outside influences. It is best to have only one pane of glass clean, allowing the other three to become overgrown with algae. This growth will help nourish the youngsters after they finish feeding from the body secretions of the parents. They pick at the algae even before they eat their first brine shrimp nauplii. The viewing glass of the aquarium should be shielded from any kind of noise, tapping, and movement. There should be no light at night from automobile headlights and the like and no other sudden light flashes into the tank. Discus are naturally timid and easily get panicky. For this reason there should be no rocks, tubes, or other impediments for them to collide with in the tank.

The spawning tank should have no plants, gravel or other decorations. The tank's cleanliness is of the utmost importance, especially the bottom and the filter. Decay gases and acids should not be given a chance to accumulate.

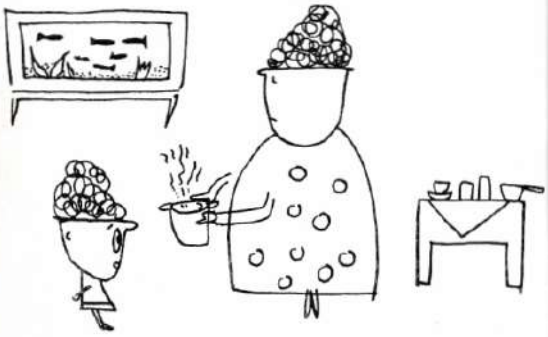
With touchy pairs it is advisable to avoid approaching the tank after the eggs have been laid and to shield the glass sides while leaving the reflector lighted. When a quick spawning is desired, I add 5 gallons of fresh water daily to my 150-gallon tank. This fresh water stimulates the hormones and appetite in such a way that the ripe pair soon spawns.

The willingness to spawn can be seen for some time previous to courtship activity by the appearance of the rear diagonal stripes. There are usually four which extend from the caudal base to the middle of the body. If discus, no matter what species they belong to, do not show this stripe pattern, it cannot be assumed that they will spawn in the near future.

Of course, the successful raising of a spawning is always dependent on a harmonious relationship of the two fish. If they do not get along well after spawning, it is best to take one out before they injure each other. As a rule, 80% of even compatible discus pairs will eat some of their eggs by the second

evening after spawning. Very often they eat as much as $\frac{3}{4}$ of the spawn and then take loving care of the rest. This cuts down the number of fry in most cases to between 20 and 40. Broods that number between 60 and 80 are much rarer. Lucky instances that resulted in more than 100 youngsters have been observed by me in only five cases in the 12 years I have bred discus.

The question often comes up as to how long the fry should be left with the parents. This is quite simply answered. For the first 6 days they pick off the gray secretion from the bodies of their parents. From the fourth day on I have observed that they also frequently graze on algae-covered surfaces and thereby derive additional nourishment. Between the sixth and seventh days the first fine infusorian foods are accepted. Frequently we are forced to take out youngsters that are no longer tolerated by the parents as early as the sixth day; these can be raised by themselves without any trouble. Other youngsters which were tolerated were observed to be still busily picking at the parents' bodies when they were up to 4 weeks old. My findings show that wherever possible the youngsters should be left with their parents for at least 6 weeks. They feel themselves better protected while in the care of the parents and grow considerably faster. It also achieves the result that the parents do not spawn as frequently. The longer the intervals between spawnings, the greater the chance of a successful spawning when it does occur. There is also a beneficial result in the health of the parents if they do not spawn too frequently.



"Watsa matter.... dey no like meata balls....?"

THE USE OF SYNTHETIC SEA SALTS IN MARINE AQUARIA

CHARLES O. MASTERS
Aquarium Systems, Inc.,
Wickliffe, Ohio

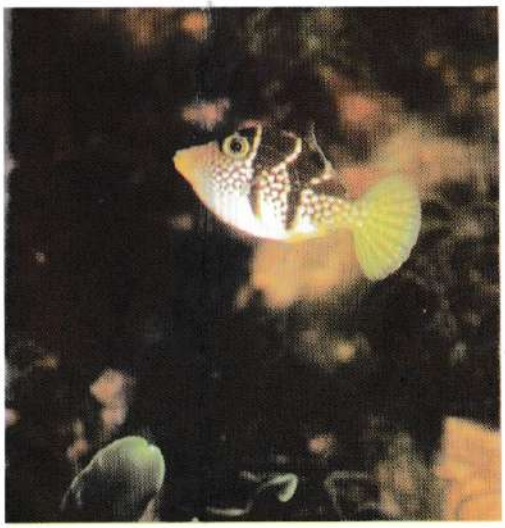
In many cases where the use of a synthetic sea salt in order to prepare seawater for use in aquariums has resulted in failure, poor management rather than the salt has been responsible. One should remember that good sea salt alone will not keep marine organisms alive!

The aquarium market is presently well supplied with synthetic salts, some of which are quite unsatisfactory, some good, and some of outstanding merit. One which will produce water capable of keeping delicate marine invertebrates alive for indefinite periods, even through life cycles, as well as sustain saltwater fishes in home aquaria, has been described by Segedi and Kelley.

Natural seawater "spoils" in storage after its removal from the ocean, no matter what is done to prevent it. Storage in the dark does not prevent these changes which eventually make the water less fit for maintaining living things, but does tend to slow down the rate of change. Even freezing the water kept in storage does not help entirely. Immediately after water is brought in from the ocean for use, it starts to undergo striking changes, especially after the introduction of the larger animals such as fish into the aquarium.

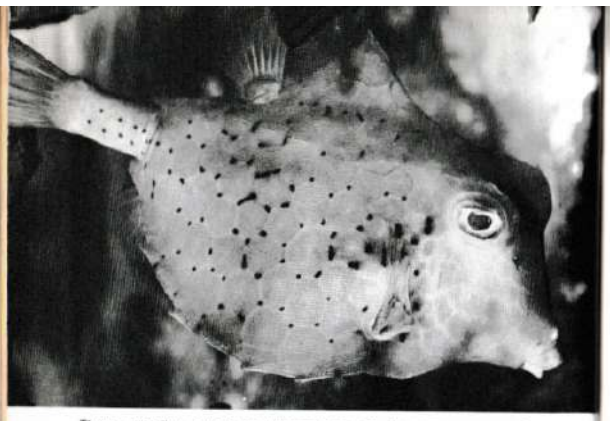
The alkaline reserve of the water starts to decrease with a commensurate gradual lowering of the pH. Nitrogen compounds, especially ammonia, which is extremely toxic, begin to appear in solution. Nitrifying bacteria on suspended particles of matter, attached to the sides of the tank, on the bottom, or scattered in the filter bed, oxidize the ammonia to nitrite and then finally to nitrate (relatively harmless), which gradually increases in quantity. The total organic content of the water also builds up, sometimes with a corresponding increase in the bacterial population. Even the chemical structure of the water changes; magnesium content decreases, while that of potassium, calcium, phosphate, and sulfate increases.

Young and spritely, this specimen of **Holacanthus tricolor** is living proof that our own U.S.A. waters do contain some charming salt-water species. In the ocean surrounding Florida, you can find mature forms of this species that have attained a size of two feet. Photo by Hansen.



Through this exquisite photographic study some of the delicate markings and interesting forms of this sharp nose puffer are revealed. Previously seen photos of this species usually showed **Canthigaster valentini** with a folded caudal; there is a decided improvement in the appearance of this species when it unfurls its caudal fin. Patience is a definite requisite in obtaining excellent photographs of fish, as this distinctive photograph demonstrates. Photo by Marcuse.

One of the larger, more hardy species of seahorses, **Hippocampus kuda**, is a native to the waters of the Indo-Pacific. In one of its color phases, this extremely long snouted seahorse seems to almost be posing for our photographer, Hansen. If you've decided to try your luck with seahorses, they'll do very well in synthetic salt-water.



These appealing aquatic creatures always get the same response from people who see them for the first time. "That's a fish!" Everybody cracks up with laughter while watching a tankful of species of this **Ostracion** genus. It's worth setting up a synthetic salt-water tank just to observe these happy little fellows: combined with some of their nutty little cousins, the cowfishes, your tank would be a funnier and cleaner show than any "Laugh In."

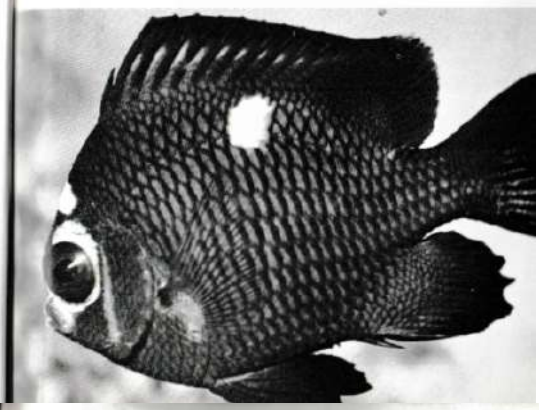
These changes, some of which are disastrous to marine animals, take place also in synthetic seawater, but at a much slower rate, possibly due to its relatively limited microbiological population when newly made up, especially insofar as bacteria are concerned. There is a growing opinion that synthetic seawater is more easily kept in storage over long periods of time, perhaps because of its relatively low organic content as compared with natural seawater. The quality of its organic content, too, may be of some significance.

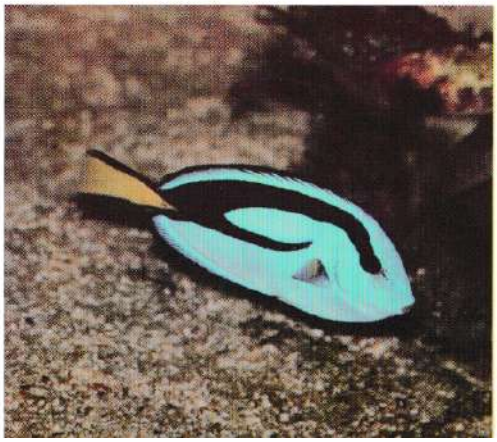
Other advantages of the synthetic material are as follows: the ease with which dry salts can be stored as contrasted with the storage of natural seawater, freedom from particulate contamination by materials such as silt, clay or even industrial wastes, relative stability of the water's physical characteristics, avoidance of possible fluctuations in salinity, savings in travel time and inconvenience necessary by trips to coastal waters, and the distinct advantage in knowing exactly what is in the prepared seawater when the recipe is published by the manufacturer.

Some of these synthetic sea salts do create the proper saltwater solution needed to maintain marine organisms in aquariums of proper design. The outstanding cause of failure, then, in many cases, has been the lack of proper design of the systems and poor management. In general, the greater the volume of water used, the slower the rate of water change and consequently the easier it is to maintain animals. There are other factors, however, which are important.

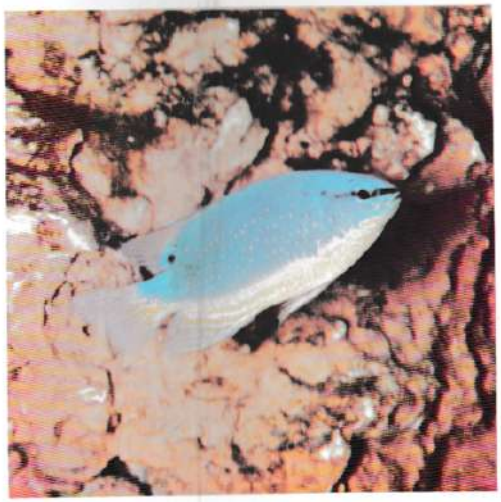
The filter bed should be of a calcareous nature so that the water is kept alkaline (pH 8.0–8.3). The aquarium should function as a "semi-closed system" with an internal circulation of water allowing for its satisfactory aeration as well as for a continuous passage through a filter bed where bacterial oxidation of nitrogenous waste products takes place. Temperatures, either above or below ambient, should be controlled by means of a refrigeration unit or heater and thermoregulator. Construction of the aquarium and all components should of course be entirely of non-toxic materials.

The controversy of natural seawater versus synthetic salt-water probably isn't completely over. But many experts prefer synthetic seawater, and as far as hobbyists are concerned, synthetic seawater is the most practical solution. **Dascyllus trimaculatus** is a species that seems to do quite well within synthetic salt-water aquaria, except for its quarrelsome, competitive nature with members of its own species.



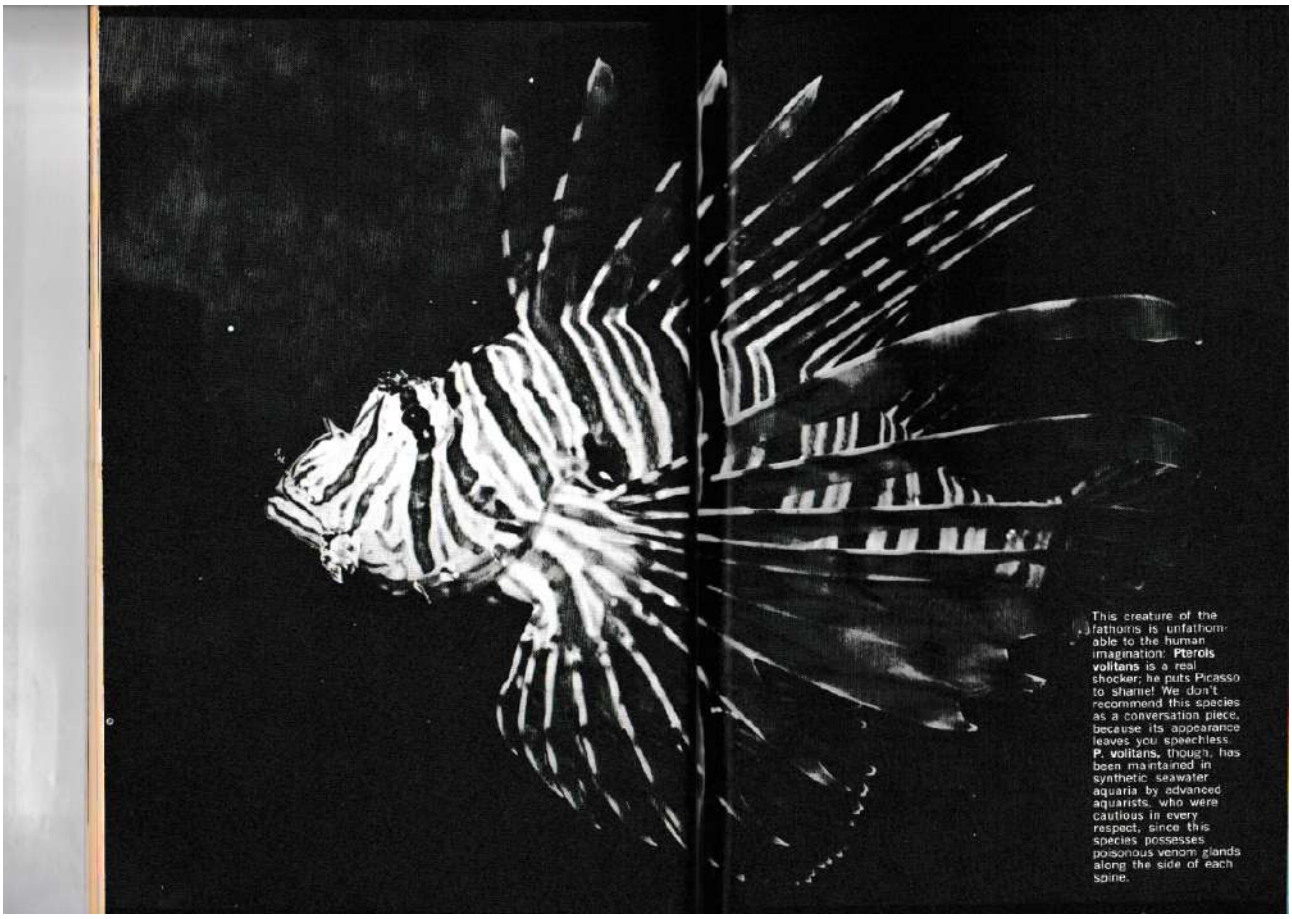


A personality fish comparable to the freshwater Oscar, this marine toughie dressed in his "Sunday Best", is **Epinephelus flavocaerulus**. He's one of those gregarious grouper fishes that is always befriending the skin diver. A member of the Serranidae family which contains species that can grow to very large sizes, E. **flavocaerulus** can be maintained in a synthetic sea water marine setup in its juvenile form. Photo by Hansen.



Another most suitable selection for salt-water aquaria, **Abudefduf saphirus** is a radiantly lovely creature belonging to the family of fishes known as **Pomacentridae**, affectionately known as damselfishes. Ichthyologists usually point out a morphological similarity to freshwater cichlids in that they also possess only one nostril on each side of their snout. Photo by Hansen.

In a marine setup using synthetic sea-water **Paracanthus hepatus** would make an ideal choice for an inhabitant for such a tank: the visual interest derived from its uncommon body structure combined with its rather peaceful temperament are characteristics which should make **Paracanthus hepatus** a more frequently seen species within the tropical fish hobbyist's world. Photo by Marcuse.



This creature of the fathoms is unfathomable to the human imagination: **Pterois volitans** is a real shocker; he puts Picasso to shame! We don't recommend this species as a conversation piece, because its appearance leaves you speechless. **P. volitans,** though, has been maintained in synthetic seawater aquaria by advanced aquarists, who were cautious in every respect, since this species possesses poisonous venom glands along the side of each spine.