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cover photograph

The ancient B-25 World War II aircraft which carried
Albert J. Klee and members of his expedition to Peru
in search of tropical fishes, is shown being fueled before take-
off from Port Columbus (Ohio). Photo by Mr. Klee. More
about the trip starting on page 57.





Barely space for members of the expedition in this vintage B-25!

A Peruvian Adventure

PART II

Nine Nuts in Search of a Bolt

WE HAD ARRANGED to have Jerry Anderson arrive in Cincinnati one day before take-off and to stay overnight with Zeke. On Sunday morning, Win Rayburn picked up both Jerry and Zeke and proceeded to my house. Although my wife prepared a robust breakfast for all of us, we really were too excited to taste the food. All equipment was transferred to my station wagon, and off we went to Columbus. Our equipment juttred from the rear of the car, poked out of windows and spilled

Albert J. Klee

Cincinnati, Ohio

over to the luggage carrier on top. We came as close to resembling gypsies as we ever would that day!

Upon arrival at Jon Krause's hatchery in Columbus, we and our equipment were transferred to one of Jon's trucks, and then we proceeded to Port Columbus airport. Missionary cargo was being loaded into the plane and a score of

Photo: Looking out from the nose cone of the B-25 just after liftoff from Columbus airport. All photos by author.



well-wishers were there to see us off. Although Win, Zeke and I had already seen the plane, this was Jerry's first look at it. What Jerry saw was an old B-25, some 20 years old to be exact, that looked as if it had flown around the world about a million times. The paint (what there was of it) was flaked, the seats in the pilot's compartment were worn down to the springs, and the general interior suggested a scene in the Cincinnati workhouse rather than, shall we say, United Airlines. Jerry seemed a bit concerned about a few oil leaks here and there but we told him that after all, nothing was perfect. He then disappeared for a while, muttering something about a last will and testament.

At this point in the proceedings, Jerry could have killed me, if looks could kill, that is. After loading our own per-

Photo: One of the parrots at Hope Zoo, Kingston, Jamaica.

sonal baggage and equipment, it remained to ascertain who would occupy what space in the aircraft. Jon Krause (pilot) and Bill Kretschmer (co-pilot) were automatically decided, and Felix elected to take the top gunner's seat (the top gun turret had long been removed). The tail, including the rear gunner's blister was chockfull of cargo so this left the nose cone and the area behind the bomb bay (the bomb bay was also full of cargo!). Then I piped up, "Jerry and I will volunteer to take the nose cone!" Before Jerry could say anything, Win and Zeke promptly dove into the rear section, pulled up the hatch door and locked up. "Well," I said to Jerry, "At least the nose cone has a nice view . . . and you did want to take pictures, didn't you?" I ducked a flying wheel chock just in time.

Now there are two ways to enter the nose cone of a B-25. If you are on the ground, a ladder can be brought up to the nose cone hatch. In any event, one can get to the nose from the midsection (which has its own door) via a narrow tunnel which is located beneath the pilot's compartment. This tunnel is so constricted that one cannot even go through it on hands and knees . . . so, one must pull oneself along on one's belly. Normally, two men in a nose cone are "cozy" but with the cargo it carried to balance our heavy tail, we carried "togetherness" to a ridiculous extreme. The word was given to "button up" and Jerry and I fastened the hatch. Promptly the temperature (this was in August) rose to over 100° F! The first engine turned over and the nose cone vibrated like an airpump. When the second engine turned over, we began to vibrate also! The racket was fantastic and Jerry and I could communicate only by shouting into each other's ear (I think Jerry was shouting "Help!" at that time but the din was so bad that I really couldn't be sure). However, since we were so

crowded, we didn't have to move far to do this.

The view from the nose was fantastic, though. We lay on our stomachs and pointed our cameras out as the plane taxied. Jon then gunned both engines. The noise and vibration had us both shaking in our shoes and we didn't know what to expect. Then the O.K. was given for takeoff. Heavily laden, the B-25 lumbered off the runway, with Jerry and I taking pictures all the way. Once in the air, however, the vibration and noise decreased considerably. When the plane went into a sharp bank, so did my stomach but we both were really enjoying every moment of it. We then began to relax for the long, 5½ hour trip to Miami where we were to pick up Jim Thomerson and Dick Stone.

One of the first things we discovered was that the nose cone leaked like a sieve. Since we were flying at 10,000 feet, the air was ice-cold. Fortunately, Bill had tossed up a roll of plastic tape just prior to takeoff, and we used this

to plug up the holes and cracks. Nevertheless, we managed to keep from freezing only by wearing sweaters, jackets and blankets. The view remained spectacular, however, and we even managed to obtain a picture of a rainbow a while later. Then we ran into rain clouds and if we thought cold air coming in was a nuisance, cold water had it beat a mile! Furthermore, the tape could not hold back the water as it did the air. The only thing we could do was to drape an uninflated vinyl air mattress over us, to try to keep dry.

We finally flew out of the rain squall and some hours later, set down at Miami International Airport. The temperature in the nose cone rose from 40° F to 105° F within 10 minutes, and we were tearing off our clothes in accordance. As soon as the wheels touched ground, we ripped off the outside hatch to get some cool air. We were certainly glad

Photos: Munching mangoes in Kingston, Jamaica. (L. to R.) Win Rayburn; a Jamaican friend; Jim Thomerson and Jerry Anderson.

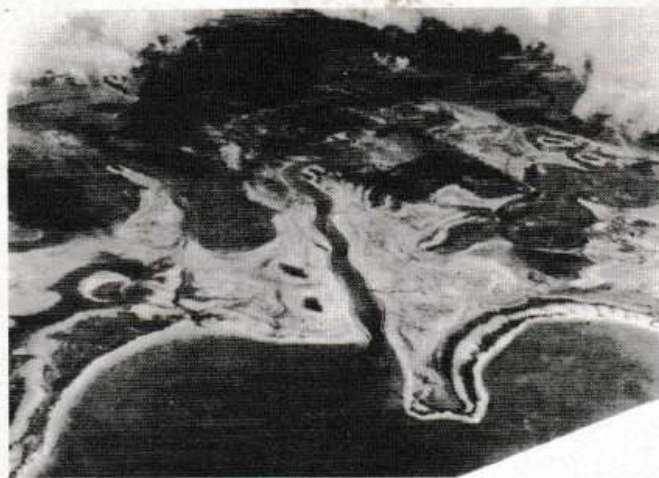


to squeeze through the tunnel and get back on terra firma once again!

Waiting for us at Miami were Jim and Dick. After loading their equipment, a small panel truck drove up alongside of the plane with additional missionary cargo. This cargo made the plane tail-heavy so guess what? Yep! More cargo in the nose to balance it out! Jerry and I groaned but good.

After looking at the plane, Jim and Dick suggested a good, stiff drink, so we repaired to our hotel room. The next day we were ready and raring to go,

Prior to takeoff from Miami, Jerry asked Jon if he could smoke during flight in the nose cone. Jon said "Yes" (under certain conditions, e.g., not during landing or takeoff, or if we ran into trouble) so while we were making the 4½ hour flight from Miami to Kingston, Jerry lit up a cigarette. Now although I don't smoke cigarettes, I am a heavy cigar smoker. I proceeded to light up a nice big "stogie." Jerry gave me a disapproving look, but there was so much air coming into the nose cone from around the old plexiglass, that the

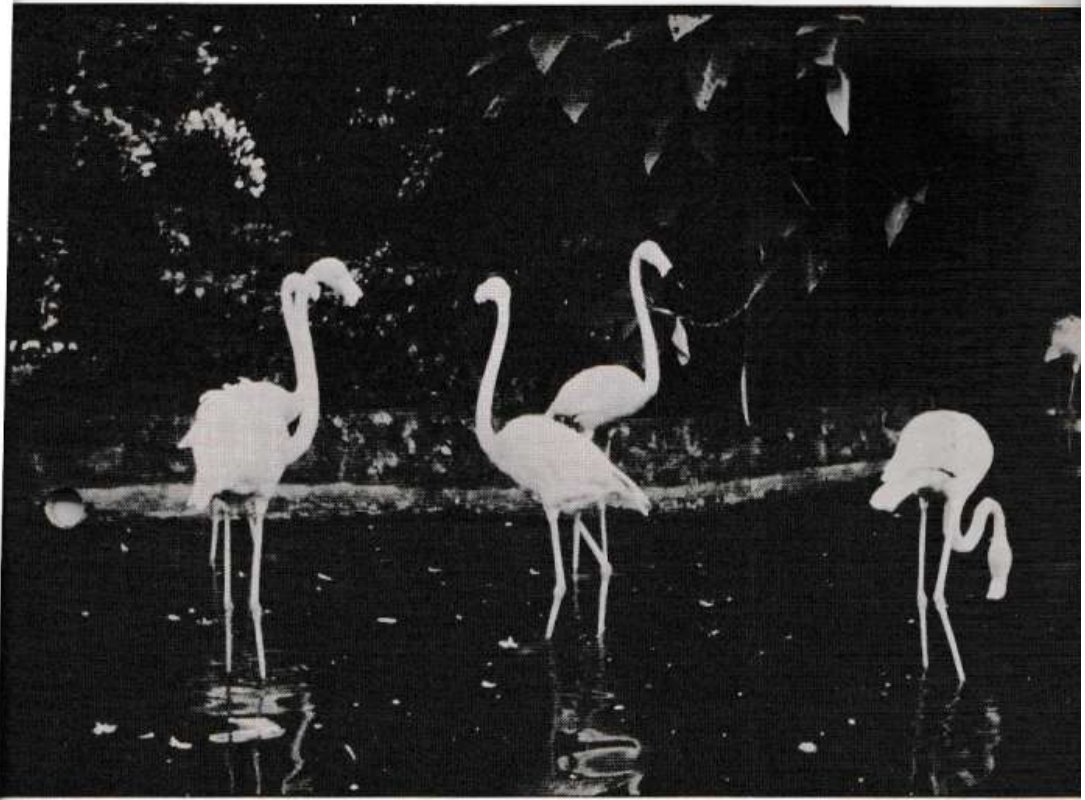


however. Jon had to file flight plans and in the meanwhile, Bill supervised the refueling operation. Our next destination was Kingston, Jamaica but because Cuba lay in our path, we could not take the direct route. That was all Castro would have needed . . . a U.S. B-25 flying over his territory! Consequently, we had to fly near the Bahamas and then through the narrow straights that separate Haiti and Cuba. We were going to hold our breaths on that one! Jim and Dick elected to share the radio area with Felix, and the rest of us took our familiar places. It was back in the nose cone for Jerry and me.

smoke blew away from us right down the center of the plane into the tail. Thus, Jerry and I were quite comfortable while smoking.

Unfortunately, the boys in the tail knew nothing of this. After a while, smoke started to billow forth from under the cargo, giving Zeke cause to think that the plane was on fire! Win and Zeke spent the remainder of the flight to Jamaica trying to find, and extinguish, a non-existent fire. Both were nervous wrecks upon arrival in Jamaica, and only by fast footwork was I able

Photo: Andros Island in the Bahamas Islands as seen from the nosecone.



to avoid having a box of cigars crammed down my throat after I explained what had happened. I promised not to smoke cigars in flight again!

Kingston was a perfectly delightful place. Before the propellers came to a halt, an airport official pedaled out to our plane on a bicycle and enquired, "What airline is this?" Jon broke up the group with laughter when he unhesitatingly shouted back, "Krause International!" After sampling the free rum punch that the Jamaican Tourist Board gives to all newcomers to the Island, we proceeded to find accommodations for the night. The next day, four of us hired a car and driver (we wouldn't dare to drive ourselves . . . lefthand side of the road driving, you know!) and toured the city and its outskirts. We saw the residential, business and wharf areas but one highlight was a visit to the Hope Zoo. This was a perfectly delightful, colorful, unfettered display and we

recommend it highly should you ever visit Kingston. We returned to the airport to find that some oil was discovered on the left engine nacelle and the left rudder of the aircraft. Evidently, some sparkplugs were fouled. Bill changed these, however, and we were ready to proceed.

Our next stop was planned for Tocumen Airport, on the Pacific side of Panama, a trip of about 3½ hours. With Jerry and I in the nose cone again, off we went. The tunnel leading to the nose cone was sealed off at the rear end by cargo after we enplaned, so once in, we were in until landing. I managed to slip halfway into the tunnel and promptly dropped off to sleep. There was no use in staying awake to take pictures since we were over the Caribbean with nothing to photograph.

About 1½ hours out of Kingston, I

Photo: Flamingos at the Hope Zoo in Kingston, Jamaica.

was awakened by Felix who was in the radio compartment with Dick and Jim. He promptly handed me (through the 8-inch space over the cargo) two life jackets. "Put these on!" he shouted. "We've lost an engine and are going to ditch!" I was stunned at the news. I crept back to Jerry who asked, "What did he say?" I will never forget the look on Jerry's face when I told him. We put the life jackets on before we realized that we already had our own personal life jackets in the nose cone with us. In his excitement, Felix had handed us the life jackets belonging to Jon and Bill!

Our original altitude was 10,000 feet but we slowly lost this, the water coming closer and closer. Jerry and I wondered what would happen when we hit.

★ IDEAS ★
BY HOBBYISTS

The Journal will pay \$5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Thermostat Filter

Most aquarists agree that an under-gravel filter should be turned off part of the time each day to keep from impairing growth of plants, but I find it a nuisance to continually have to start and stop my pumps. Making this even worse, when the filter is off and the heaters are on, the water becomes too warm at the top of the tank, and too cold at the bottom. This is good for neither fish nor plants. To solve both problems, I plugged my pump into the thermostat that controls the heaters in the tank. Now the filters are turned on and off automatically, and are always operating while the heaters are on, preventing stratification of the water. —
Gene R. Tompkins, Brooksville, Kentucky

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Surely the nose cone would be torn off, or perhaps would just go under water? At 2500 feet, the B-25 held altitude and Felix motioned for me to enter the tunnel. "Jon thinks we can make it on one engine at this altitude!" he yelled. I went back and told Jerry, much to his relief. At intervals, Felix would give us a sign that all was well but unfortunately, he saw no difference between "thumbs up" and "thumbs down." Consequently, we never knew whether we were going to be all right or whether we were going down. The strain was tremendous.

Then, we entered a terrible storm. The nose cone was covered with a sheet of water and as usual, the water entered and soaked us to the skin. This time, it wasn't the water that worried us, however. It got quite dark and the plane was buffeted about, bouncing us considerably in the process. Every time the B-25 lost altitude in the storm, we failed to regain it. Even at maximum power, this was the best our lone working engine could do. The Caribbean was coming closer and closer. Jerry and I prayed like we never prayed before. We shook hands and said our "good-byes."

(To Be Continued)

CLUB NEWS

Rochester Aquarium Society

New officers of this New York group include John P. Dessauer, president; Ronald Forsyth, vice president; John Press, secretary; Mrs. Lois Olyslager, treasurer, according to Iva M. Kent, corresponding secretary.

The R.A.S. meets the first Wednesday of each month except July and August at the Rochester Museum of Arts and Sciences, 657 East Ave., Rochester, N. Y., at 8:00 p.m., Mrs. Kent said.

AQUARIUM JOURNAL

PART II

THE CLASSIFICATION of the live-bearing snails is as follows: Phylum, Mollusca; Class, Gastropoda; Order, Ctenobranchiata; Family, Viviparidae. The species common to the Eastern United States is *Viviparus contectoides* Binney. The Japanese snail which is very much similar but considerably larger is *Viviparus malleatus* Reeve. The species native to

identify the sex. The male has its right tentacle considerably modified and curved. It serves as a sheath for the copulatory organ.

Research work has demonstrated that the color bands on the shell are present many weeks before the birth of the young snails. The Japanese species can be identified by the ridge-like processes which occur on the big turn of the snail

Identify sexes by the appearance of their feelers; they enjoy animal foods

Live - bearing Snails

the United States has been recorded from Michigan, Illinois, Indiana and all the way south to Florida. It is not found north of the Great Lakes. *Viviparus contectoides* is so closely related to *V. contecta* Millet which is widely scattered in Europe along with *V. viviparus* Linnaeus, that for many years, it was believed that the local species was the same as the one found in Europe.

The Japanese species introduction has "escaped" into natural habitats in the United States and is now found in lakes, streams, and springs from our West Coast all the way to the East Coast, and down to St. Petersburg, Florida.

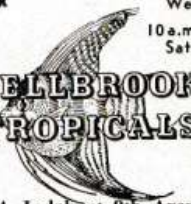
Viviparus contectoides is sometimes known as the Potomac snail ever since the time it was first introduced in large numbers to the Potomac River near Washington from the source along the Mississippi River. The Potomac snail has a thin shell, smooth surface, dark body, large head, and a thick foot. Usually there are five greenish rounded coils forming a rather tall spire and ending in a round mouth. The shell is sometimes "horn-colored" and quite dark varying with several large dark streaks. The tentacle, or antennae, or "feelers," are rather small and can be used to

Charles O. Masters

Walhonding, Ohio

whereas the Potomac snail is smooth. The size of the male Potomac snail is approximately one inch and the female may be almost twice that size. The Japanese snail is considerably larger, sometimes being greater than two inches. It is possible therefore to sex the adult live-bearing snails quickly by observing their sizes. If the "trap-door" mouth (operculum) is less than three quarters of an inch in diameter, the snail is a male.

Some of the common names are swamp
(Continued on Page 81)

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"The Amazing Dolphin" is subject
of lecture by Marineland curator

David Brown to Give Alvin Seale Lecture

DAVID H. BROWN, Curator of mammals at Marineland of the Pacific, Palos Verdes Estates, California, has been selected as the speaker of the 1965 Alvin Seale Lectureship, to be presented at the Morrison Auditorium, California Academy of Sciences, Thursday March 4, 1965, at 8:00 p.m. according to Frank Tufo, president of the San Francisco Aquarium Society, sponsors of the annual event.

Subject of Mr. Brown's lecture will be "The Amazing Dolphin," which will

be in part illustrated by film showing interesting cetacean behavior observed in tanks at Marineland. Mr. Brown's discussion will include the general natural history of dolphins; the impact made by these animals on man, both in ancient and modern time; interesting facets of behavior, physiology, anatomy of dolphins, with particular emphasis placed on the problems posed by these fascinating creatures to the people who endeavor to hold them in captive environment.

Mr. Brown will also show a color film entitled "Expedition Walrus," which graphically gives an account of an expedition taken to the Arctic by members of the Marineland staff; and the progress and problems of the babies in captivity and many other interesting sequences of Marineland exhibits. ◀

— didn't exactly underscore the man's smile.

David Brown, English-born curator of mammals at Marineland of the Pacific, Los Angeles, has been caring, feeding and training whales since 1957, when the Marineland collecting crew became the first persons ever to catch a whale

Force-feeding Whales is only Part of the Job!

THE MAN in the white coat walked to the edge of the platform that stretched across the surface of the largest salt water tank in the world, looked into the yawning jaws of three huge whales, and then calmly put his hand and forearm completely into the tooth-studded mouth of the false killer whale.

"She's really a very gentle animal," he said reassuringly, but the teeth—measuring 3/4 inch in diameter at the base and spaced like pickets in a fence

alive on the open sea. They brought the female pilot whale to the oceanarium and Brown and his staff began the arduous and risky task of trying to get her to feed.

It was arduous because no knowledge existed on what to feed whales or how to feed them. Bubbles—that was what they named the new arrival—refused all food for 14 days. And, finally, in des-

Photo: David Brown and Eoot Calandrino of the oceanarium's collecting crew, affectionately pet "Woody," first of four walrus captured in the Bering Sea in May, 1961. All four walrus are now thriving in their Southern California home and weigh 1500 lbs. each.





peration, Dave Brown donned diving gear, grabbed a handful of fresh-frozen squid, and jumped into the tank, literally to force-feed the pouting whale.

He really wasn't sure whether Bubbles would kiss him or kill him.

The whale did neither. But she ate the squid. And during the next 48 hours, she ate 272 pounds of squid. From then on, Brown, the whale trainer, and Bubbles became the best of friends.

Since then, he has cared for, fed, doctor and trained an assortment of pilot



whales, including Bimbo, at 20 feet and 4,500 pounds, the world's largest whale in captivity; a keenly intelligent false killer whale named Swiftly, the first of her species caught alive by man; rollicking, clownish sea lions; five different species of dolphins, all of them trained for "show business" acts; a scared and very sick infant sea elephant tossed onto the rocks near Marineland by a churning sea; four 40-month-old walrus brought to the oceanarium from the Pacific Arctic when they were two weeks old by a special Marineland expedition; and a number of other sea mammals, including several species of harbor seals, porpoises and otters.

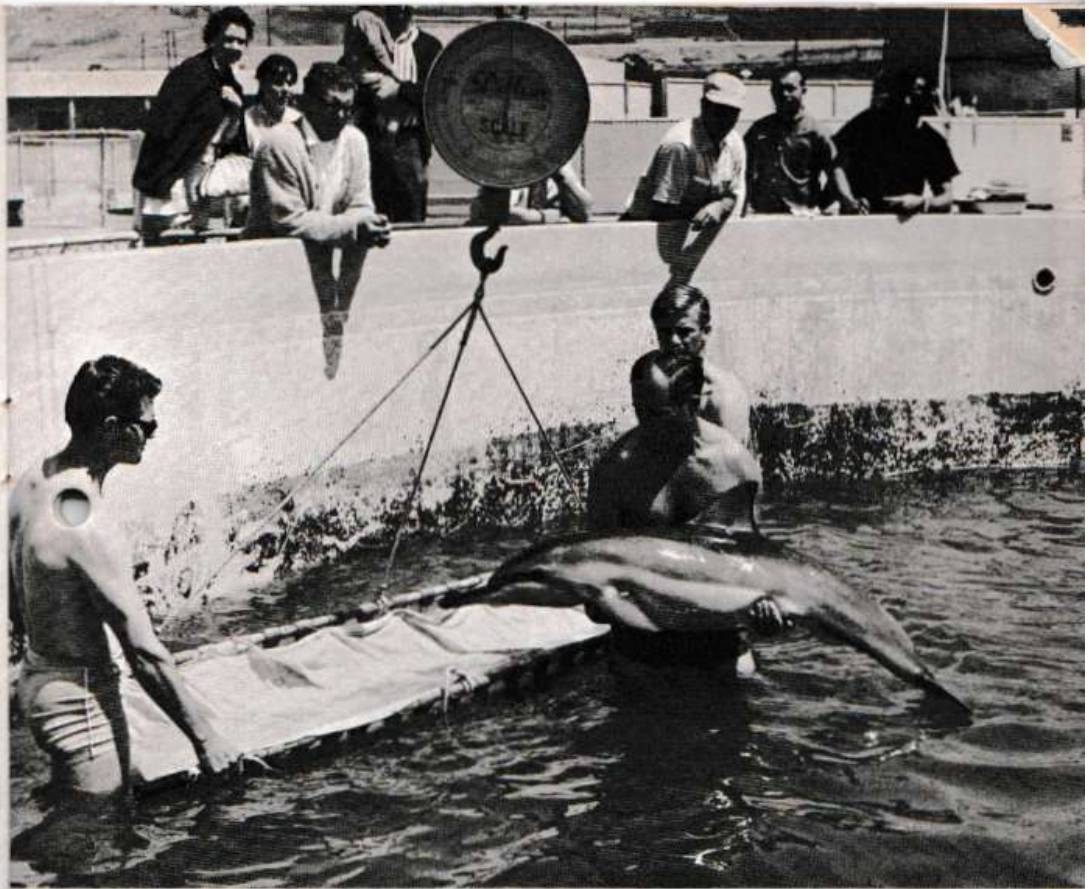
At present, Brown has some 65 marine mammals in the watery shows and in exhibits at the oceanarium. He keeps exacting records of each animal, including medical histories that would do justice to a general hospital. Whales are given electrocardiograms and every mammal's blood count and medical progress is carefully noted.

It is a most unusual business, especially for a man who never saw a whale until he joined the Royal Navy. Brown was born and raised in Buckinghamshire and attended High Wycombe Technical College for four years. After serving with the Home Guard, he joined the Royal Navy in 1943 and served with the motor torpedo boats in the English Channel, and North Sea. Later, he joined the staff of the London Zoological Society as keeper in charge of the marine sections of this organization's aquarium.

He journeyed to Southern California to continue his work with marine life and in January 1954, several months before Marineland of the Pacific publicly opened, he became a member of the oceanarium staff.

Photos: (Top) David Brown and Jake Jacobs, chief diver of the oceanarium, help a newly-captured pilot whale become acclimated to her new home. (Left) "Woolly" places a restraining flipper on Eddie Asper's leg as David Brown gives Friscilla a shot of antibiotics.

AQUARIUM JOURNAL



One facet of his remarkable success with these sea animals is that Brown early realized preventive medicine is a key to maintaining healthy happy animals.

"In 1954, we were starting almost from scratch," he says. "From the time of the ancient Greeks and Romans until 1938, when Marine Studios was built in Florida, little interest was shown in these creatures. Marineland of the Pacific was the first full-scale oceanarium and so we had to build a body of knowledge."

"When the first whale was caught three years after the oceanarium opened, the investigative process began all over again," Brown says. "These animals are subject to certain maladies in the ocean," he continued. "In captivity, however,

maintaining health is a never ending task — for after all, in the sea conditions are 'quite sterile.'" Thus the newly captured dolphins or whales lack resistance and are peculiarly susceptible to the bacterial and viral diseases of man.

And so it is that when a group of rare spinning dolphins are jet-freighted to Marineland from Hawaii, one of the first things the animals get is an influenza vaccination. But they aren't the only ones. Every animal is vaccinated annually and its progress, reactions and behavior are carefully checked every day.

One of his latest favorites is Swifty, the first false killer whale captured alive by a man. Swifty—11 feet, three inches

Photo: David Brown carefully lifts a spinner dolphin into a weighing hammock upon its arrival at Marineland. The spinner dolphin was captured in Hawaiian waters by the oceanarium collecting crew.

long and weighing 875 pounds — has been a part of Marineland's Whale Show for nearly a year now and despite her ferocious appearance is as gentle as a lamb.

"She just wants to play," Brown said.

Swiftly pushed her bullet-shaped head above water and opened her awesome mouth.

She almost seemed to smile. ◀

the plans made for Dave by his father, a master smith who turned out prize-winning wrought iron work. The senior Brown arranged for his son to attend High Wycombe Technical College and prepare for an advertising career.

Upon graduation from High Wycombe, an entirely different career became necessary, for the time being at least. Brown entered the Royal Navy

David Brown has a Unique Background

DAVID H. BROWN, born March 9, 1925 in the English village of Chalfont St. Peter, has been fascinated by fishes and animals almost his entire life.

The Marineland curator of mammals recalls: "From as early as I can remember, I have been interested in animals from a naturalist point of view and also have loved to have them as companions. When I was only five years old, I would leave my home, walk to the fishmonger's in the village and beg some small fish from him to play with. When I was only three, as my parents later told me, I brought home a deceased rodent found in a field and began poking at it with a stick by way of examination."

Brown grew up in Chalfont St. Peter, Buckinghamshire, about 22 miles southwest of London, with a varied assortment of animal friends — baby ducks, foxes, fishes and other creatures. But a naturalist career was not included in

and served for three years, being discharged in 1946.

Thereupon he entered the advertising business, becoming a member of an agency in London. He tried his hand at several of the skills involved in becoming an all-round advertising man — art, production, layout, design, accounting, presentations to clients and so forth. Brown tried for 18 months to shape himself to the mold which had been chosen for him. And he appeared to be making quite a success of it, there were promotions and raises in pay.

But the glamor of the advertising business had no attraction for him. The work he had at first found to be so interesting and challenging became oppressive. He began looking around for other opportunities.

The first place he looked was the London Zoo. Here was Utopia, as far as he was concerned, animals galore, fishes, birds and an outdoor existence. So he went to the zoo and applied for a job, asking for any task, no matter how menial. He was given a job as an attendant, almost the lowest of the low; his duties were to maintain the grounds and exhibits. Trading in his advertising flannels, he donned the rough clothes of an unskilled laborer and began a new career. All the while he dreaded the very real possibility that one of his friends from his former world would

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notice him in his new capacity. But this did not interfere with his applying himself wholeheartedly to his job, studying and learning more about zoology and trying to advance himself.

Soon his efforts were rewarded and he was promoted to aquarist, charged with care of more than 100 aquariums of all sizes containing fishes from all corners of the world. His dreams were coming true. His reading and studying continued. He began to command respect as a practical naturalist.

One day in 1951 he was showing some American visitors around the zoo when an opportunity opened which brought a radical change in his life. One of the Americans, Arthur McBride, invited Brown to come to Hermosa Beach, California, in the United States and take charge of an aquarium and sea lion show.

It was a difficult choice to make. Brown was married now. His lovely wife, Valerie, whom he had wed in 1947, was consulted about making such a big step and they decided "to take a fling at it." They came to the United States and settled in Hermosa Beach, while he took over operation of the aquarium's tanks and animal show.

After two years at Hermosa, Brown was approached by officials of a new oceanarium, Marineland of the Pacific, which was being built on the ocean shore only 10 miles south of Hermosa. Marineland told Brown that it needed someone to take care of what would be the biggest salt water tanks in the world, holding more than 500,000 gallons each, and having hundreds of underwater windows through which spectators could observe marine life as though peering through a window in the ocean. He took the job and became aquarist of Marineland early in 1954.

At first his duties included caring for the fish in the tanks and in the many small aquariums about the building, plus

supervising the porpoise games and other shows. But, as the mammal exhibits grew in importance, his duties shifted to care of mammals and birds and responsibility of creation and execution of the many daily shows involving not only porpoises, but also sea lions and, later, whales, otters and walruses.

In 1957 Brown made history by helping to tame a whale for the first time in the history of man. Marineland's collecting crew captured Bubbles, a 14-foot, 1400-pound female pilot whale and put her in one of the big, three-story salt water tanks. But she would not eat food in captivity. Brown, after working for three weeks trying to coax the whale to eat, finally made her take nourishment by practically forcing food down her throat.

In this manner, the whale got a taste of what the human was offering her. It was squid — the pilot whale's favorite

(Continued on Page 96)

CLUB NEWS

Greater Pittsburgh Aquarium Society, Inc.

At a recent meeting of the G.P.A.S. their annual auction was held, and members were invited to bring their surplus equipment for buying or selling to other members. The society had a 20-gal. tank, 15-gal. tank, a tank stand, reflector, plants and equipment for the auction, according to the corresponding secretary. ◀

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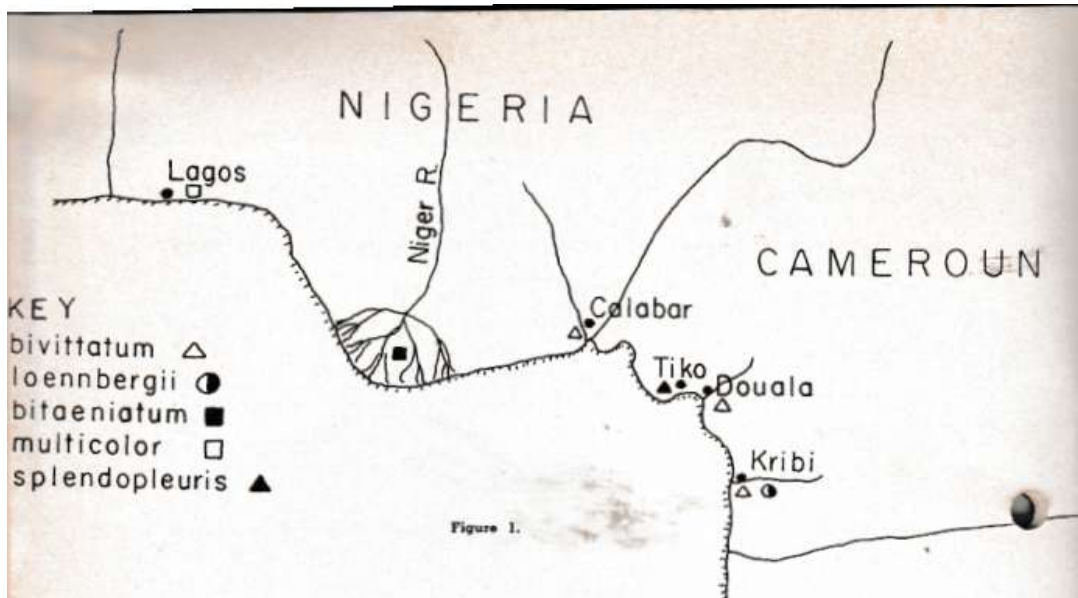
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The unifying characteristic is two
long, black lines on the females

The Bivittatum Group

PART I INTRODUCTION

THE bivittatum group of killifishes has been defined by aquarists to contain the following species: *Aphyosemion bivittatum* (both subspecies, *A. bivittatum* and *A. bivittatum hollyi*), *A. bitaeniatum*, *A. loennbergii*, *A. splendopleuris* and *A. multicolor*. Perhaps the unifying characteristic of these fishes is the presence of two, black longitudinal lines on the body of the females. Indeed, even an expert killifish fancier cannot distinguish the females of these forms from one another readily, if at all. The question arises then, "Are these distinct and valid species?" It is to this question that the following discussion is devoted.

A HISTORY OF THE BIVITTATUM GROUP

Aphyosemion bivittatum was described by Lönnberg in 1895 and Boulenger's "Catalogue of the Freshwater

Albert J. Klee F.A.K.A.

West Chester, Ohio

Fishes of Africa" lists a distribution of this fish from Old Calabar in Nigeria, down through Douala and the Kribi River in the Camerouns. Thus, it has a very wide distribution. This fish, which we will refer to as *Aphyosemion bivittatum bivittatum*, was imported into Germany as an aquarium fish in 1908 with a second, larger importation being made in 1929. The second member of the group is *A. loennbergii*, described by Boulenger in 1903. This is a southern Cameroun form, also from the vicinity of the Kribi River and consequently, *loennbergii* overlaps in this area with *bivittatum bivittatum* (see Figure 1). It was imported at the same time (1908)

Figure 1. Shows distribution of the Bivittatum group in Africa. Sketched by the author.

and by the same firm with *bivittatum bivittatum*, and at that time was readily distinguishable from the other. The next importation into Germany was made in 1928. In 1924, Ahl described *A. bitaeniatum* although it was not imported as an aquarium fish until 1934. However, it never did become a really established aquarium fish even then. It was described as coming from the Niger

scribed "*Aphyosemion bivittatum* variety *coerulea*," but because *coerulea* was preempted (preoccupied) by *Aphyosemion coeruleum*, Dr. George S. Myers renamed the fish as *A. bivittatum hollyi* in 1933. It was imported in 1929 from West Africa but its exact locality was (and remains) unknown. Unlike *multicolor* and *splendopleuris*, *bivittatum hollyi* became quite rare and disappeared

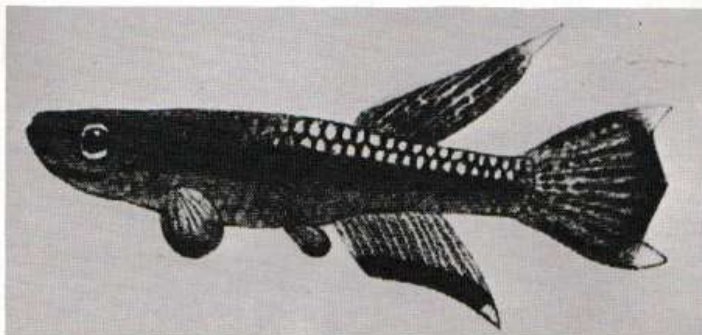


Figure 2.

(where it, also, overlapped with *bivittatum bivittatum*).

The year 1930 proved to be a busy year for the description of members of the *bivittatum* group. *Aphyosemion multicolor* and *A. splendopleuris* were described at the same time by Hermann Meinken, the former as originating from Lagos in Western Nigeria, and the latter from Tiko in the northern Cameroun area. Thus, *multicolor* extended the range of the group farther west, while *splendopleuris* overlapped the range of *bivittatum bivittatum*. Both fishes were imported in the previous year (1929) as aquarium fishes but Arnold and Ahl claim that *multicolor* was imported as far back as 1912, also. This I find hard to believe. Later in 1930, Meinken de-

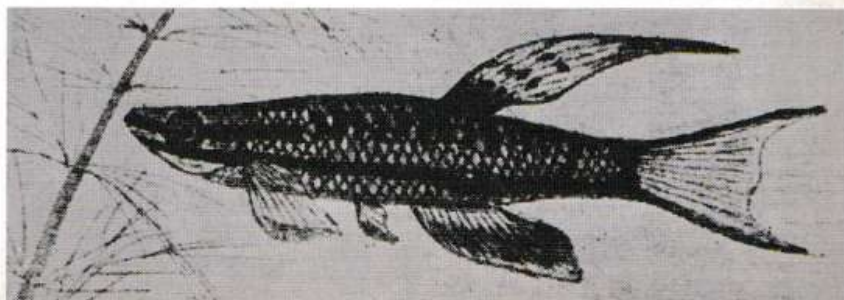
scribed "from the aquarium scene.

SOME DESCRIPTIONS

When *A. loenbergii* was imported, aquarists had no difficulty in distinguishing it from *bivittatum bivittatum*. The former had such a brilliant sheen to its body that it was called the "Glanzfundulus" (= "glazed *Fundulus*"). Although both fishes had each scale edged in red, there was an underlying color of green-to-blue on *loenbergii* (this was yellowish-brown to reddish-brown in *bivittatum bivittatum*). The crisp, blackish longitudinal lines were absent in the males of *loenbergii* (there was a suggestion of these lines but they were

Figure 2. *Aphyosemion loenbergii*. Figure 3. *Aphyosemion bitaeniatum*.

Figure 3.



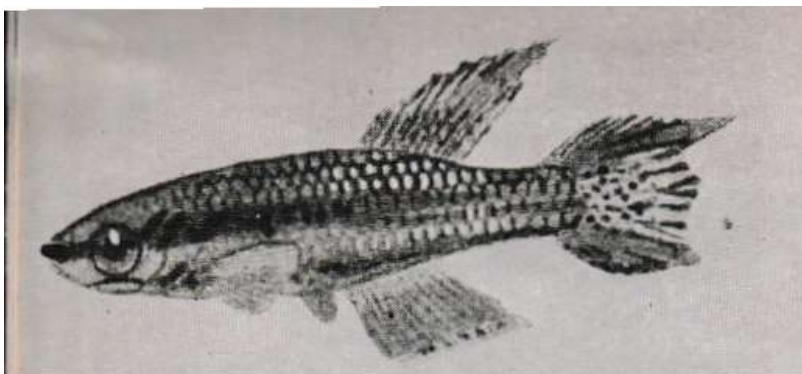


Figure 4.

formed by different patterns of iridocytes rather than melanophores (as in *bivittatum bivittatum*) but the dorsal, anal and caudal (both lobes) were tipped in a lemon or sulphur color (see Figure 2). However, *bivittatum bivittatum* did have the longitudinal lines, and its unpaired fins were considerably more elongated.

Next on the scene was *A. bitaeniatum*. Although this fish was very similar to *bivittatum bivittatum*, it was distinguished by its more slender body shape, a brownish-green body (sides) and a very elongated dorsal fin, more so than in *bivittatum bivittatum* (see Figure 3). Furthermore, although the lower longitudinal line was present, the upper one broke into short vertical slashes not too far after the pectoral fins. In truth, *A. bitaeniatum* was much closer to the "bivittatum" of today than the *bivittatum bivittatum* of early German aquarium history.

Chronologically, *multicolor* and *splendopleuris* (see Figures 4 and 5) were imported next and were immediately recognized as being very close to *bitaeniatum* and *loenbergii*. *Aphyosemion multicolor* was easily differentiated from all the others in that the fish showed

all the colors of the spectrum, hence the name. The longitudinal stripes, although present, were not intense and depended upon the light source to a great extent. Furthermore, there was a good deal of yellow or yellow-orange in the anal and tail fins. *A. splendopleuris*, on the other hand, was really a yellowish fish both in body and in finnage. Unlike *bivittatum bivittatum*, its fins were relatively short and it did not have much in the way of red-edged scales on its body (these were mostly found along the upper longitudinal line). The longitudinal lines were stronger than in *multicolor*. Furthermore, the tip of the dorsal fin was yellow, resembling that of *A. loenbergii*.

Finally, *A. bivittatum hollyi* made its appearance (see Figure 6) This was immediately distinguished by its bluish sides (greenish-blue to dark-blue). Also, the upper longitudinal line tended to break up into short, vertical strokes as in *bitaeniatum*. Its dorsal fin was elongated as in *bivittatum bivittatum*. It more closely resembled present-day "bivittatum" in body coloration than does the

Figure 4. *Aphyosemion splendopleurus*. Figure 5. *Aphyosemion multicolor*.

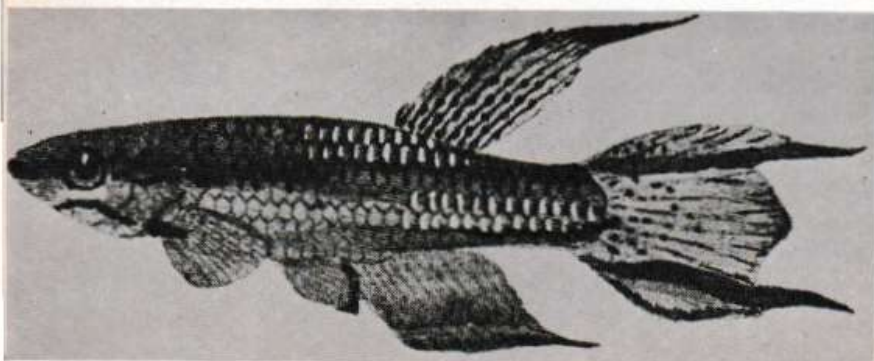


Figure 5.

original importation. I have been calling *bivittatum bivittatum*. However, it must be remembered that *bivittatum hollyi* also possessed a bluish anal and tail fin, a coloration not present in the ordinary, aquarium forms of *bivittatum* seen today. It is important to stress that the mere presence of a bluish body does not fulfill the requirements for a *hollyi* form. If one were to sum up briefly, the

A. loennbergii – gleaming green with yellow-tipped fins

A. multicolor – colors of the spectrum with much yellow in tail and anal fins

A. splendopleuris – yellowish in body and fins.

Finally, to complete this section we should present certain key technical measurements of all of these forms, if

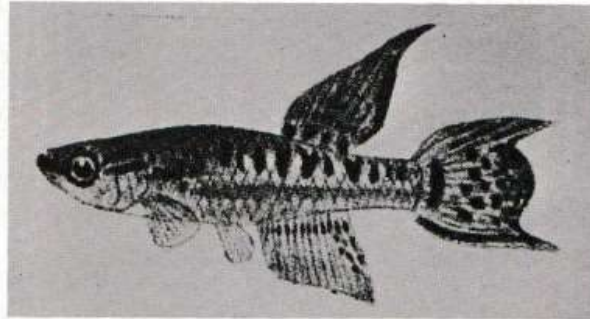


Figure 6.

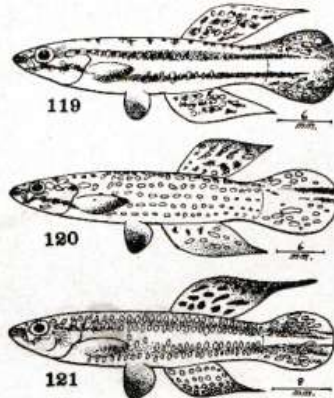


Figure 7.

important features of these forms, they would appear as follows:

A. bitaeniatum – slender body, elongated dorsal fin, upper longitudinal stripe broken into slashes

A. bivittatum bivittatum – basically reddish-brown on its sides

A. bivittatum hollyi – bluish in body and fins

only to show how difficult it is to distinguish among them by these criteria alone. For this purpose we present Table I. (See page 78.)

One cannot leave this discussion of the description of *bivittatum* forms with-

Figure 6. *Aphyosemion bivittatum hollyi*. Figure 7. Variation in natural populations of *Aphyosemion bivittatum* (after Fowler).

out referring to Fowler's discovery of the variability of pattern in *bivittatum bivittatum* which were collected in the vicinity of Kribé in the Camerouns. His sketches are shown in Figure 7 (these are all male specimens but the caudal extensions were knocked off in transit). These alone suggest the tremendous variability of even one local wild population!

quently, details are lacking. The work of Bozkurt in 1945 is quite detailed, however. Bozkurt had no difficulty in obtaining fully fertile hybrids from *splendopleuris* - *loennbergii* crosses. These hybrids stood inbetween the parent forms morphologically. Under no circumstances, however, was it found possible to produce a *bivittatum-loennbergii* hybrid.

TABLE I
Counts and Measurements on *Bivittatum* Forms

Form	Length, mm	Dorsal rays	Anal rays	Lateral scales	Depth in length
<i>bitaeniatum</i>	60	9-10	12	27-28	4 1/2 to 5
<i>bivittatum bivittatum</i>	65	11-13	13-14	26-29	3 2/3 to 4 1/3
<i>bivittatum hollyi</i>	55	12	14	28-29	4 to 4 3/4
<i>loennbergii</i>	50	11-12	12-13	26-28	4 to 4 1/2
<i>multicolor</i>	60	10	13	26	4 to 4 1/2
<i>splendopleuris</i>	55	11	13	25-27	4 to 4 1/2

TABLE II
Comparison of *Bivittatum-Splendopleuris* Forms (after Bozkurt)

Item	<i>bivittatum</i> male	F ₁ male	<i>splendopleuris</i> male
1. Body color	chocolate brown	brownish-olive	olive
2. Ventrals	brownish	orange	yellow
3. Tip of dorsal and caudal	red; lobes on tail same length	yellow; upper lobe longer than lower	yellow; upper lobe longer than lower
4. Middle of dorsal	dark red; black dots	orange-red; black dots	yellow-red
5. Pectorals	colorless; blue-edged	greenish-yellow	yellow
6. Ventrals and anal	light yellow; faint border	yellow; bordeaux-red bordered	bordeaux-red border
7. Tail fin border	outer margin bordeaux-red, inner margin red	outer margin bordeaux-red, inner orange	outer margin bordeaux-red, inner yellow

PREVIOUS GENETIC RESEARCH

In the year 1930, the first cross within the group was made, i.e., *A. loennbergii* x *A. multicolor* (we follow the usual procedure of listing the male first, female second, in all crosses noted by an "x" separating them . . . if a "-" is used, this signifies the cross both ways). No difficulty was encountered in producing the F₂ hybrid. Unfortunately, the information was never published and conse-

Bozkurt did produce *bivittatum-splendopleuris* hybrids. The F₂ generation males fell right in between *bivittatum* and *splendopleuris* males, appearance-wise (see Table II). However, the F₂ generation proved sterile. A male was available of ancestry *multicolor* mother and *splendopleuris* father. This male hybridized readily with a *bivittatum* female but again, the F₂ were sterile. Furthermore, the hybrids never attained

the finnage and coloration of the straight *splendopleuris-bivittatum* cross. ◀

(To Be Continued)

Masters

(Continued from Page 65)

snails, swamp lid snails, pond snails, river snails, and trap door snails.

Once the female is fertilized, it remains fertile for life. In general, the Japanese species lives twice as long as the Potomac snail, the males of which live one year, the females about two and a half years. For this reason, when the latter species is being collected in quantity, several generations of females exist at the same time while never more than two generations of males are ever found. In the late winter, one generation only of males can be found.

Neither species will survive the very warm waters of some aquaria so it is rather difficult to keep them with warm water tropicals. Food must be both animal and plant. In Germany several years ago some experimentation with the species *V. viviparus* demonstrated that at the end of fourteen months, those which were fed only vegetable food were approximately three fifths of an inch in diameter, whereas, those fed animal food too, were at least an inch in diameter. In India, similar species have been found existing in certain localities but were difficult to identify because they had been deprived of proper animal food and were not fully developed.

The initial growth rate of the snail is extremely rapid. At the end of the first three months the largest of the new generation is usually as large as the smallest parent. Since the local Potomac snail is often sold as the Japanese Snail, which is considerably more desirable, it is necessary to immediately look for the "keels" on the large whorl of the shell. If they are present, the snail is of the Japanese species.

Both snails have gills, thereby obtaining their oxygen from the water and do not have to come to the surface to breath. They live mostly submerged close to the aquarium bottom but the Potomac snail has the habit of burying itself in the sand quite often and also because of its sluggishness, is not as desirable as the Japanese species. They both have a high adaptability to the drying-up of waters in their native habitats by burying themselves in the mud or decaying vegetation or by secreting a protective mucus layer over the mouth of the shell. Many stories have been told about the long periods of time these snails were able to survive in such situations in which the moisture is sealed within the shell.

In parts of the Orient the snail is considered a choice article of food and is sold commercially. ▶

CLUB NEWS

Northeastern Indiana Aquarium Society, Inc.

New officers of the N.I.A.S. are: Sandra Dentzer, president; Bruce Stevenson, president-elect; Mrs. Stevenson, secretary and Jane Dentzer, treasurer, according to Sandra Dentzer, president. Fred Bolinger will serve as the club's Cusac representative, while Robert Brewer will act as alternate, Miss Dentzer said.

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1. **D**ON COOK comes equipped with all of the assets that editors of aquarium society publications should have. He has asset A — a rapier sense of humor and a lively ability for weaving it in and out of his written material. Asset B — a knowledge of fish gained by working with them for all but 5 years of his life. This may sound as if it should be listed with the standard equipment when it comes to the requirements of an editor, but you'd be surprised that some editors of club publications are admittedly lost out in never-never land when it comes to fishes. They are never-never going to know very much about

2. **FINNY FOLKS**
By Diane Schofield

3. them. Asset C — which is the one that turns most editors algae green with envy. This is a clever talent for cartooning. The majority of us are limited to tracing a cartoon (or a written line) and then only if we hold our tongues just right.

4. Of course, it must be said to Don's discredit that he did waste those first five years of his life badly. It wasn't until this age that he spotted a huge, 2 foot diameter, glass fish bowl kept by the Nuns at St. Mary's Hospital. Things perked up from then on and his high school years found him keeping and studying native fishes and writing papers on the Johnny and rainbow darters. He got into "hot" water at this time too — or rather warmer water. Enter tropicals!

5. Many people have won many things at fish meetings — tanks, pumps, heat-

Photos: (1) Glenn Henderson, president of the Pomona Valley Aquarium Society. (2) Don K. Cook. (3) George Donner, chairman of the Tri-City show. (4) Georgia Donner, secretary and editor of "Fish 'N Fun" bulletin of the Tri-City group. (5) Margaret Cook of the Decatur Aquarium Society.

ers, thermostats, plants and — wives. For Don Cook met and “won” Margaret at a fish society meeting. Happily, therefore, there was none of this business of converting the little woman over to the hobby. As Don says, “tropical fish are more than a hobby with us, they are a way of life, as it would seem strange not to have them to take care of.”

The one that Don and Margaret most adore to “take care of” is the fighter of the fish world. For the past eight years, Don has been breeding the betta and studying the genetics of its color pattern. When not occupied with these, he breeds the common silver angel and red delta-tail guppy. Both of these fishes work diligently for Don to offset the \$500 per year required to run his fish room. This sum may seem rather herculean, but let Don explain. “The reason why our fish room is so expensive is because I believe in using only incandescent light. My plants are our pride and joy, and I feel that we get better growth and brighter greens from them under this type of light.”

Don admittedly favors “fighters” in fish and he is no slouch himself as he doesn’t fear in the least to be controversial. For instance he comes right out and defends the much maligned mollusk. “Definitely without the smaller varieties of snails, our plants would suffer from algae growth on the leaves. I have found that healthy plants are not eaten by snails.” [Editor’s note: For most plants I’ll certainly agree with this; however, such things as water fern (the submerged variety) are snail bait no matter how well grown.]

“The Little Magazine With a Big

Photos: (1) A random shot of the Tri-City Aquarium Society show. (2) Don Ziegenbusch, president of the Orange Belt Aquarium Society. (3) Richard Stewart, president of the Tri-City Aquarium Society. (4) Some of the members and board of the Tri-City group. All photos by author except Nos. 2 and 5 by Don Cook on page opposite.

FEBRUARY, 1965



1.



2.



3.



4.

Mouth" was what he termed his first editorial post, "The Aquatic Net," that he edited for the Central Illinois Aquarium Society. Last year, a new society came into being - The Decatur Illinois Aquarium Society and "The Aquatic Net" added a third word onto its name, "Digest." Both Don and Margaret are the editors of this "new-old baby," and its 24 pages are studded liberally with the gems from Don's cartooning pen. Exchange address: - R.R. No. 1, Box 215, Decatur, Illinois.

Don is also one of the few editors of aquarium society bulletins to hit the "slick" trail. The term, "slick" is, of course, the name applied to the professional magazines in the field because of the texture of their paper. His column, "Decatur Date Line" appears regularly in "Tropicals."

When Don has a minute or two left over from dancing attendance on fish and writing about them and drawing

them, he has another "hobby." He drills wells for a living.

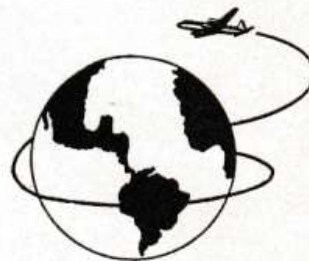
• • •

There is a club in California whose members all come equipped with feathery wings, glittery halos and little 3-stringed harps. Of course, they really don't, which is a blessing because wings can get frightfully bedraggled when they happen to trail in a jar of brine shrimp, gilt halos are likely to slip over the eyes when bending over a tank and getting wet works the very dickens with the F-string of harps. It's just that when talking to a man like George Donner, Chairman of the Third Annual Show of the Tri-City Aquarium Society of Riverside, California, you get the impression that all of their 75 members are almost too good to be even slightly human.

For instance, when I asked him if he had any help besides his three Co-Chairmen, Tony Stewart, John Simpson and Dick Stewart, in putting on this most

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excellently presented show, he replied, "Oh, all of the members pitch in. All I have to do is snap my fingers and I get more help than I need!" Taking time to carefully close my gaping mouth, I pursued this tack by asking him if there was never any dissent in their club such as is sometimes encountered in other like organizations. Mr. Donner retorted, "We're like a closely knit family. Maybe we'll argue a little amongst ourselves in a friendly way, but just let any outsider start picking on any of our members —"

To promote more "togetherness," The Tri-City Aquarium Society has no less than 20 different get-togethers in the course of a year! These include field trips to various fishy spots, as well as such giddy-goings-on as parties on every conceivable party day, i.e. Halloween, New Year's, Christmas, etc.

As Maui has the nickname of "The Friendly Island," the Tri-City group could well be dubbed, "The Friendly Club." They offer a service to neophytes that, so far, I have never seen duplicated in another society. Many amateurs quail before the aspect of putting an aquarium into a large show. They have only been in the hobby for a few months — enough to know a little something about fish. But to set up a tank right out in public for everybody to look at? The old hands at this sort of thing take such timid tyros under one of their before mentioned downy white wings. Any junior or senior who is having a go at entering a show for the first time can be assured of having all of the help that he or she needs in any show that the Tri-City Aquarium Society sponsors. Suggestions are made as to how to have a crystal clear tank in five minutes after filling it (wash new gravel well and put out in the sun before using, or better yet, use only old gravel or half old and half new); how to make sure your fish are always going


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to be right out in front for judging and viewing (Slope your gravel down toward the front of the tank. Tanks that are placed on a higher shelf in the show have to be sloped more sharply than those on lower shelves. Also rocks should be placed far to the back so that fish don't have room to hide behind them); how to rectify the situation if your fish still persist in languishing unseen (Add a few more fish. This usually brings out the old "tenants"); and all of the rest of the multitudinous details that go into setting up a trophy winning show tank. This has turned into a kind of a Wet Workshop and Mr. Donner said that their members go on to show in all of the big shows in Southern California after getting their sealegs in one of the Tri-City shows.

To show how completely altruistic and almost unhuman their members are, many of the older ones will refuse to put in more than one tank in a show saying that they'd rather give the fledglings a chance. Space is at a premium in the Riverside Municipal Auditorium where all of their shows are held and each year many entries are turned away. For every cancellation there are three members just dying to use up the display space.

The shows of the Tri-City Aquarium Society are held in connection with the Riverside Hobby Association. 1964 saw the fishy folks of this club winning two prizes in the over-all hobby show. One was a first in Showmanship (eye appeal) as their booth drew the biggest crowd of people and the second was for The Best Collections.

Much of the success of not only this show, but past shows as well, has been due to Georgia and George Donner. In this world of typographical errors, this is not one. I know. I was caught up in this supposition when I wrote to Georgia and said, after reading what I thought was "her" name in one of the "slick"

magazines, "Good heavens, Georgia, they've made a man out of you!"

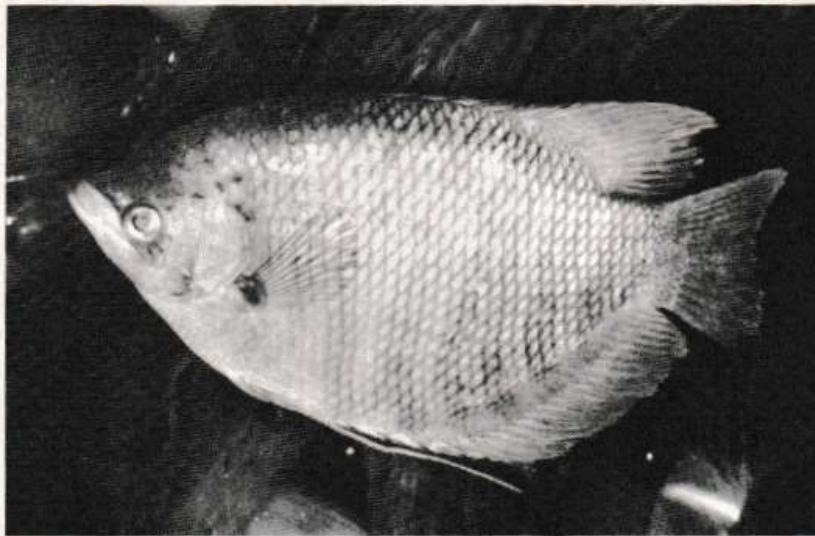
George Donner is very definitely a separate entity and a fascinating one. How many times, after all, do you find an Hawaiian-Irish jockey running around a fish club? George was born and raised
(Continued on Page 90)

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Meat Baster

Separating newly hatched brine shrimp from shells and unhatched eggs can be a rather involved task. An ordinary meat baster can prove to be an invaluable asset to the hobbyist and takes considerable toil out of handling these minute creatures. Simply suck up the shrimp with the baster where they are concentrated by the light. The baster is also quite valuable when used to move tiny fry from one aquarium to another, as well as removing those fry that may have been accidentally drawn into a filter. The baster is more maneuverable, less likely to roil the water, and excellent for getting into those hard to reach spots where nets and other devices cause frightened fish, scattered shrimp nauplii, and in most cases a frustrated aquarist. — Gary K. Rose, Cottonwood, California

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Their appetites put Jackie Gleason
to shame — they even eat leaves!

The Giant Goramy

ALTHOUGH *Colisa fasciata* has for years been popularly called the giant gorami there is another fish which certainly deserves every claim to priority on the name. This fish is *Osphronemus goramy* and aside from being the only fish of the anabantoid group which bears *goramy* in its scientific name, it is truly a giant when compared to the other anabantoids which are commonly kept as aquarium fishes.

Although a number of cichlids are not noted for their willingness to miss a meal, the gluttonous appetite and seemingly endless capacity of the goramy is a digestive miracle. As far as food is concerned almost anything organic and

Braz Walker

Waco, Texas

soft enough or small enough to swallow will qualify, including water plants, lettuce, fish food, dog food and cat food. Even half rotted leaves which were accidentally introduced into the aquarium with plants grown outdoors were eaten almost as if they were considered to be part of a chef's salad. If fed to capacity their growth is astounding and will be rivaled by few aquarium fishes.

Reputed to be native to the East Indian Islands including Borneo, Java and

Photo: *Osphronemus goramy*, an adult specimen.
Photo by the author.

Sumatra, the goramy is now found also on the mainland throughout the Far East wherever conditions are suitable. This is a heavy bodied, meaty fish whose rapid growth to a large size has made it the subject of extensive fish culture. Since the majority of the anabantoids build a nest of bubbles above the surface of the water it was assumed for many years that the goramy was no exception. Dr. Vaas, a professional fish culturist in Java reports in the January 1952 *Aquarium* that this is an error. In the ponds where the goramy is cultured, the Javanese breeder supplies his adult fish with twigs, straw, bamboo fibers and other material from which a nest is constructed always beneath the surface of the water. Both parents take part not only in construction of the nest which takes about a week, but also in the care and guarding of the eggs. This occupies about ten more days. After they are free swimming the baby fish seem to be on their own. Nests are sometimes robbed by the culturists after which the eggs are floated in wooden

tubs in the pond until they hatch.

The goramy has a reddish brown background coloration with a series of brassy gold stripes which appear when the light reflects from the right angle. In young specimens an ocellus (eye-spot) appears but this is lost as the fish takes on size. In larger sizes although very showy, unfortunately the goramy is a very aggressive fish, especially to those which he considers competition. If more than one is kept together unmerciful bullying will take place. The loser is seldom allowed to eat and this results in his being outgrown tremendously, compounding the situation.

Probably the best approach to breeding is to keep individuals isolated until breeding size is reached. In mature fish sexing is not difficult since males are darker and more colorful. Although I have not yet bred this fish due to a lack of space, when a young mature pair were placed together, typical tail slapping and "petting" were observed. This

Photo: *Osphronemus goramy*, a juvenile specimen.
Photo by the author.



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plus a tolerance for each other which had not before existed, may indicate a desire to spawn and as soon as I have space I may take a crack at it.

One last point of interest about the goramy is the fact that this fish along with the paradise fish was one of those first tropicals kept by Pierre Carbonnier, who was the father of our hobby. ◀

Schofield

(Continued from Page 87)

on the windward side of Oahu in the Hawaiian Islands. His father raised race horses and George ended up riding at Tanforan, Santa Anita, Bay Meadows and a host of other well known tracks, plus riding in various motion pictures under the aegis of Louis B. Mayer.

Now, however, his talents are directed toward riding hard on fish. Although he terms himself a "dreamer," some of those dreams are pretty realistic and practical. For instance, he has devised a system of racks to hold the exhibition tanks in shows. Each 14' section can be completely dismantled by taking out only 6 bolts. George also opines that you have to either employ a barricade of barbed wire or a rattan chain to keep the children away from the tanks. Barbed wire seems a little unfriendly so he uses a fragile rattan chain. If the kids happen to break it, it is easily mended and they seem to be so frightened of their dire deed that they forget all about clamming their little hands onto the front of the aquariums.

To further the look of the tropics, he uses some of the artificial grass that one sees in store windows to simulate lawn. It comes in rug-like sheets and George uses this to cover the bottom portions of some of the stands to give them a woodsy appearance.

If a member wants to utilize a thermometer in a show tank and not have

it glaring in all too obvious "thereness," George suggests hanging it over the edge of the *side* of the tank. One can then read the temperature reflected in the glass. It's backward, to be sure, but it's very readable and yet the thermometer is almost invisible.

And to put the finishing touches on his "dreams" George has devised an automated assembly line plan whereby the entire breaking down of their show is completed in exactly one hour and a half from the time the first fish is caught until the last sweeping up of the floor is accomplished!

★ IDEAS ★
BY HOBBYISTS

The Journal will pay \$5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Water Softener

The gravel available in many places contains calcium and/or magnesium and the water in contact with it becomes progressively harder again, after softening, so that periodic use of the softener is desirable. To spawn soft-water fish such as glow-light tetras, rasboras, etc., the water can be made slightly acid after softening by the use of peat moss or an extract made by boiling peat moss in a porcelain-lined vessel. The experiments I conducted indicated that the pH cannot be consistently reduced and controlled unless the water is first softened, as the free calcium and/or magnesium reacts with the acid so that the pH remains nearly the same. You should keep records of tests of the water you put into your aquarium. Water may be softened in advance by storing it in wide mouth five gallon jars or bottles and operating the softener in the jar. Old aquarium water may be softened this way too. — P. R. Rizkallah, Lawrence, Mass.

FEBRUARY, 1965

There is yet another little trick that he employs which has nothing to do with fish shows, but it is a neat one, nevertheless, especially if you want to filter 120 gallons of water with a filter meant for a 5-gallon tank. He puts a regular sub-sand five-gallon filter in the bottom of one of those rectangular plastic containers that are usually used for refrigerator dishes, dish pans, or any other of a multitudinous number of household purposes. Then this is filled up with aquarium gravel, the air hose attached to the filter in the usual way and the entire set-up is put into the bottom of a large tank. This contraption keeps up to 120 gallons of water crystal clear! When it needs to be cleaned, George simply takes it out, runs water through the sand to flush it of dirt and pops it back into the tank.

Georgia is no slouch herself. Last year she was president of the club and this year, the secretary. She has also



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been the editor for their clever little bulletin, "Fish'N-Fun." Other societies may exchange with them by mailing their publications to 4065 Dell Avenue, Riverside, California.

The Tri-City Aquarium Society is only one of the angles in a fishy triangle in their portion of the world. The Orange Belt Aquarium Society and a

"baby," the Pomona Valley Aquarium Society, form the other two parts of this three-cornered geometrical design. Many people are members of not only one of these societies but two or three. "Baby" is sort of catching up with the rest of the boys though. Its membership now equals that of the Tri-City group. ◀

PRODUCT NEWS

German Goldfish Food

TetraFin, a new basic diet for goldfish, has been added to TetraKraft Werke line of fish foods, represented in the United States by Kordon Corporation, Hayward, Calif. The new product is a flake-form food, formulated in West



Germany from animal and vegetable sources to provide a high (30%) protein diet. It is described as a nourishing, palatable food for goldfish and other outdoor pool fish. The retail package is a colorful, three-quarter-ounce unbreakable plastic can. ◀

CLUB NEWS

San Francisco Aquarium Society, Inc.

The next regular meeting of the S.F.A.S. will be Thursday February 4, 1965, at Morrison Auditorium, California Academy of Sciences, Golden Gate Park, at 8:00 p.m., according to Frank Tufo, president.

Program for the evening will be a talk by the internationally known aquarist and writer, Albert J. Klee. Subject of Mr. Klee's talk will be his recent expedition into the jungles of Peru in search of fishes. His talk will be illustrated by color slides, according to Jim Crawford, program chairman.

Fish of the Month for the February meeting, according to Charles Bange, chairman: (1) Miniature aquarium arrangement, 30-minute time limit; (2) Goldfish varieties; (3) Dwarf cichlids; (4) *Panchax*, *Epiplatys*, *Aplocheilus*, *Rivulus*, *Pachypanchax*.

There will be door prizes; fish problems will be discussed and there will be the usual spread of refreshments, according to Joe Zins, Chairman.

Join the S.F.A.S.



More than one in a tank could be

fatal — except in this unusual case —

Three's a Crowd!

TO HAVE an electric eel, (*Electrophorus electricus*), in a large aquarium is not at all unusual, nor are they difficult to maintain in fine condition for many years. However, to keep two or more in the same aquarium is a different story. It is very likely they will bite and shock one another fiercely. The anterior end of this fish is equivalent to the positive pole of a battery; the posterior end, the negative pole. Therefore, when fighting, they rub head to tail with each other

Warren Zeiller

Curator of Fishes
Miami Seaquarium

and convulse violently from their own electrical discharges. When such activities are not stopped, the aquarist is liable to find himself with but one battered specimen, or none at all.

Photo: Electric eels observed during a time of peace in their tank at the Miami Seaquarium. Photo by Don Reen.

PROGRAMS

Readers and societies are invited to submit ideas to The Journal for Aquarium Society meeting programs, including lectures, slides, films, demonstrations, etc. There is no charge for these listings.

"Living Fishes," 16mm color sound film. The SCIENCE IN ACTION cameras visit the exotic fishes in the Steinhart Aquarium. A 21-minute tour of the colorful and fascinating underwater inhabitants, conducted by Dr. Earl S. Herald, SCIENCE IN ACTION program host and curator of the Aquarium. Rental: \$15.00. For information: Television and Motion Picture Department, California Academy of Sciences, Golden Gate Park, San Francisco 18, Calif.

"Corydoras Genus," includes color slide set of 15 species and a section on breeding Aneas. 53 slides together with a tape recording of the manuscript. Also a written manuscript is included to indicate when to change slide. Rental \$10.00. For information: Earle Hamilton, Box 427, Route 1, Lansing, Michigan.

"Sea of Cortez," 16mm color sound film. Members of a scientific expedition explore the beautiful underwater kingdom of the Gulf of California. This SCIENCE IN ACTION program offers a rare glimpse of the marine life in the waters first sailed by Cortez four centuries ago. Dr. Earl S. Herald is host and narrator. 21 minutes. Rental: \$15.00. For information: Television and Motion Picture Dept., California Academy of Sciences, Golden Gate Park, San Francisco 18, Calif.

"Story of the Brine Shrimp," a 30-min. color and sound 16 mm film that also covers the tropical fish hobby. Rental: \$10. For information: San Francisco Aquarium Society, California Academy of Sciences, San Francisco 18, Calif.

Three electric eels had resided in harmony in one of the Seaquarium's 500 gallon wall tanks for a number of years. One of the trio died, and a year or so thereafter the remaining two began to fight, and had to be separated with a one-fourth inch plexiglass sheet. Attempts at reuniting them, even with the introduction of a smaller third specimen, were futile.

Early in November, 1964, the two in the wall tank were moved to the lab and placed in separate aquariums. New gaskets were installed in the wall tank and the entire display was rebuilt. Rock side walls were cemented together to reduce their bulk and provide more free space. Hidden electrodes were installed to illustrate electrical discharges through light patterns on an oscilloscope, and sound from a loudspeaker. Then the two original eels, and a smaller new specimen were put into the wall tank together . . . and the battle began. The loudspeaker crackled furiously as they bit one another and rubbed head to tail. The fresh water supply was turned off to allow them to build up a high level of the protective slime which they exude from their bodies. Murky water from their lab aquariums was added to the fresh to hasten the process. By so doing, it was hoped to prevent, or reduce infection of their wounds. Fighting continued throughout the day and it was decided to let them "have it out" overnight.

The following morning, the three were alive and in good condition! The fighting had ceased. The water was so dark that the back glass could not be discerned. The water supply was turned on at a very low rate of flow, and in two hours the tank was clear. Bitten areas could be detected only by a roughened skin surface; there was no apparent bleeding, or even redness.

The three have been coexisting peacefully ever since and there is no reason

to believe they will not continue to do so. During this time all wounds have healed without the slightest sign of infection.

This case is a behavioral study of great interest. What originally caused this group to revert to type in captivity and turn on their own? Might this recur, based, perhaps, on attempted matings, efforts toward group dominance, or . . . what? ◀

[Editor's note: *So little is known about the behavior of electric eels in the wild that the behavior noted above is impossible to interpret. Some sort of territorial behavior may be involved but if so, how was the "battle" settled? Whatever the reasons, the behavior of these and other electric eels remain a mystery, however, we are glad to record Mr. Zeiller's observations. S.W.*]

★ IDEAS ★
BY HOBBYISTS
The Journal will pay \$5.00 for original ideas published. Keep less than 200 words. Send your idea today!

Insect Food Over Lawn

From early spring until late autumn there proliferates a largely untapped supply of small insect life over any lawn. This is a highly nutritious food, attractive, and an excellent conditioner. It may be utilized very easily:

Set a small electric fan on a post or shelf outdoors. Often an existing light by a door may be used; otherwise place a small light bulb behind the fan, and to the wire guard around and before the fan blade attach a nylon stocking. Turn on fan and light at first darkness and await results. Insects, often tiny, but in great quantity are attracted to the light, caught by the fan driven air, they are swept into the stocking which streams out like a wind-sock at an airport. They

seem not to be able to crawl out again. In very dry weather it pays to sprinkle the lawn below this trap a bit. The collected mass should be fed into covered tanks as some may survive to crawl out. Watch out for a late-flying wasp, which may be "bloody but unbowed" as the poet said. Such a wasp is apt to be cross. Many of our aquarium fishes are primarily insect eaters, and this food seems to provide something lacking in worms and our trusty brine shrimp, for which God bless San Francisco. — C. K. Rorke, Cobourg, Ontario, Canada ◀

PRODUCT NEWS

Peekskill Trophy Awarded

Mrs. Ola Donadio, head of Peekskill Tropical Fish Products, was donor of the Peekskill Trophy for the best fancy guppies displayed at the 1964 Pet



Festival in New York City. The trophy was won by Fred Samuelson of Brooklyn. Paul Hahnel was the judge. Semi-finalists included Arnold Sweeney and the Mac Guppy Hatchery. ◀

Subscribe to The Journal

Brown

(Continued from Page 73)

food — although unrecognizable to the animal in its shapeless mass so different from the fast-moving creatures whales swallow by the hundreds while feeding in the ocean. Once used to the taste of the dead food, Bubbles began eating avidly. Thus Brown's bravery in diving into a tank with the huge animal and ramming food into her snapping jaws resulted in a whale learning to eat in captivity for the first time in history and eventually becoming tame enough to accept food from a man's hand.

Brown soon launched a training program for the whale. The program grew into a show and eventually Marineland's star attraction was the six-times-daily performance of three trained whales — Bimbo, a 4,000-pound male, Bubbles, and Buttons, a 10-foot baby whale. ◀

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Question: I purchased a young lionfish about three months ago and kept her in an Oscar salt water tank. My hydrometer was kept at the proper reading and my water was clear. I drained off some of the water every few weeks and added fresh sea water and was careful not to chill the water. One day, I noticed that my pet did not eat her morning live fish that I fed her. I have been feeding three fish daily, never feeding any dead fish and she always ate well, always begging

Salt Water Fishes

By Robert P. L. Straughan

and showing off. But this morning I found her staying on the bottom barely moving around.

I notified my dealer and he said he thought it was my water but after a while he decided against that and said she had fungus. He told me to apply a copper pad (Chore Girl Pad) in the water and in a day or two she would be better. I would like to know if I was right or wrong by applying the copper pad to the water. The fish improved a few days after it was sick but then it appeared sick again so I put the pad in the water. The next day, my beloved pet was dead. I would like to know if I did wrong so I won't make the same mistake with my next lionfish. This one had so much personality and I miss her.

— D.W., Tucson, Arizona

Answer: Of course I cannot be positive, but I would say that the copper pad killed your pet. Just because the lionfish would not eat is no sign that it was sick. Lionfish often go on "hunger strikes" for several days to two weeks and then when it is over they will swim around as hungry as ever. Adding a copper cleaning pad is a dangerous way to attempt a cure. Lionfish are very susceptible to copper poisoning. If the fish was thought to have fungus it should have been

treated with sulfathiazole sodium which is safe to use and extremely effective. I had a pet lionfish for almost six years and treated it with this drug occasionally. Before my pet died, she went for almost three months without eating and I feel she simply died of old age. Yes, lionfish do have a lot of personality. ◀

★ IDEAS ★
BY HOBBYISTS

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Home-made Fish Food

I have been using some easily made fish foods for some time and my fish eat all of the resulting foods. The following are three separate formulas.

1. Mix equal amounts of powdered shrimp and a high protein flour (soy bean, whole wheat, pea or bean flour). Add salt and dried salmon eggs for flavor. Make this into a paste by adding a beaten egg in water for each pint. Place a one-quarter inch thick layer in baking pans. Allow to dry. Break off pieces, grind and sift as required. Do not overfeed.
2. Grind puppy biscuits and mix with half as much powdered, dried shrimp and a few pinches of salt for each quart. Make this into a paste with water and a beaten egg. Dry into one-quarter inch thick cakes. Grind and sift.
3. Mix 2 parts of quick cook oatmeal with 1 part powdered shrimp, add a few pinches of salt. Boil and stir for ten minutes over a slow fire. This may be refrigerated, but not longer than five days. These formulas, like all food, should be kept covered in a cool place, preferably in the refrigerator. Vary the food. For example, you can rotate the feeding of 1, 2, and 3, then live food on a four day cycle. — Fred G. Pelich, Lawrence, Mass.

FEBRUARY, 1965

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From: Pat McNally
Kirkwood, Missouri

I have purchased a piranha and wish to know more about them. I want to breed them but I don't know if it is possible. There are different types. Do they cross breed? How do you tell the difference between male and female?

REPLY: *There are several species of piranha and at least one of them has been bred in aquaria, in very large tanks, larger than likely to be owned by the "ordinary" aquarist. Perhaps some of the different species occasionally crossbreed in the wild but this is probably rare. In aquarium kept piranhas, distinguishing sex is difficult. The male usually has a more intense red or orange color and a somewhat narrower build; other sex distinctions are not known to me.*

From: Ian Derrick
Gold Coast City, Australia

A recent introduction to the Australian aquarium scene at present being imported from U.S.A. is the "Gro-Lux" fluorescent lamp. Quite apart from the claims of increased plant growth it is also being purchased because of the remarkable effect it has on the coloration of fish—particularly reds and blues. Many local societies organize competitions throughout each year for the best arranged aquarium, points being allotted for quality of fish, plants and arrangement. Because of the high expense involved not all aqua-

rists are equipped with "Gro-Lux" and the question now arises should a "Gro-Lux" equipped aquarium be allowed in such competition. Doubtless each society will draw up its own set of rules in this respect—meanwhile it would be interesting to know how American societies have rules on this point. Thanking you for producing such an excellent magazine.

REPLY: *This has been a heated point in some societies in the U.S.A. and I have not tried to follow the results.*

From: Ercan Unalan
Ankara, Turkey

Why is *Tanichthys albonubes* called the cardinal fish? And how is this fish bred?

REPLY: *Presumably Tanichthys albonubes received the name of cardinal fish in Turkey because of its red stripe. Cardinal being associated with red because of the red habit (clothes) of the Cardinals of the Roman Catholic Church. The fish is easily bred in very hard water or moderately soft water. The "secret" is cool temperatures, 72° F being best. Simply place a pair or two in a 10 gallon tank, feed them well, provide plenty of fine plants, have few or no snails present and wait. Well fed adults will not eat their young or eggs. The young that appear may be raised with the parents or removed as they appear, a few every week.*

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