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The DRUM AND CROAKER finally gets off the ground with the aid of new covers by that inimitable artist and aquarist, Sam Hinton (Scripps, LaJolla) and original cartoons from Dick Cortimilia (Cleveland Aquarium). Ye Editor has little apology for the long delay in getting out this issue except to say that the Steinhart staff has been tied up in an Aquarium bond issue campaign for the past six months. The bond issue having been approved by the San Francisco voters, DRUM AND CROAKER is the first subsequent item of business.

1. ANNOUNCEMENT OF NEXT AQUARIUM SYMPOSIUM

Dr. Sherman Minton, local chairman of the ASIH meeting advises us that the evening of August 26, 1958, will be held for the Aquarium Symposium. The place is the University of Indiana at Bloomington (not Bloomington, Illinois). Please mark on your calendar August 25 through August 28, which is the schedule of the ASIH (American Society of Ichthyologists and Herpetologists), meetings held in conjunction with the multiple meetings of the AIBS (American Institute of Biological Sciences).

Titles already scheduled include the following:

Sam Hinton: Longevity among aquarium fishes (15 minutes)

James Atz: Principles and practices of water management

in public aquaria (20 minutes) First year of operation of the New York

aquarium (15 minutes)

Lawrence Curtis: Review of feeding practices among U.S. aquariums (15 minutes)

Capt. Wm. Gray: New field collecting techniques (12 minutes)

Earl Herald: Cinematographic review of the external features

of some U.S. aquariums (12 minutes)

Wm. Kelly: Particle size vs. filter effectiveness in sand and gravel filters (10 minutes)

and graver fricers (10 minutes)

Panel discussion on the pilot blackfish or whale: F.G. Woods Jr (Marineland), chairman of panel; Capt. Wm. Gray (Seaquarium), Kenneth Norris (Marineland of the Pacific) and Spencer Tinker (Waikiki Aquarium).

There are two other tentatively scheduled talks: A review of fish transport methods (Ken Norris) and pressure filter designs for aquariums (Ross McBride).

There is still time to schedule other talks, so send *in* your titles together with time required for presentation and whether' or not a projector will be needed. As has been customary in the past, C.W. Coates is Permanent Senior Chairman of all Aquarium

Symposia, with the brunt of arrangements falling upon the local chairmen, in this case Bill Braker of Shedd Aquarium, Chicago, and Lee Finneran of Belle Isle Aquarium, Detroit. Chris Coates sends best wishes but will not be able to attend this year. He will, however, be ably represented by his associate, Jim Atz.

It is quite appropriate that Bloomington should be selected as a meeting place for fish-minded people -- since it is one of the birthplaces of American ichthyology. David Starr Jordan was president of the university there before coming west to become the first president of Stanford. Later the Bloomington fish collection was purchased by the California Academy of Sciences and thus formed the nucleus of the present CAS collection.

II. NEWS FROM THE AQUARIUM WORLD

Although there has been a deathlike silence from most U.S. aquariums about their activities, the following is what we have been able to garner: first of all, a salute to the two newest aquariums in the country - both opened during June of 1957 - Westport Aquarium located at Gray's Harbour, Washington, and the reincarnated New York Aquarium located at Coney Island. Both are alike in that they are primarily summer season aquariums, and both have had water problems.

Caracas, Venezuela

Plans have been drawn for one of the most fabulous aquarium setups ever designed. The main feature is a one-million-gallon tank constructed in the shape of a basket and made almost entirely of glass. From the fishes' viewpoint this is not a workable arrangement. These plans are in preparation for the 1960 Caracas International Exposition; DRUM AND CROAKER will follow the developments with interest.

Fort Worth (Record Aquarium)

Sharp horsetrader Lawrence Curtis has hornswoggled the Australians out of a couple of Australian lungfish, which, we are told, have arrived in good condition. Although African and South American lungfish are readily available these days, there are fewer than a dozen Australian lungfish outside of Australia.

Marineland (Florida)

Paddles, the 8 ft., 500 lb. pilot whale, died on April 10th, after having lived for a month in the main tank. Previously, (December 16, 1957) nine whales were rescued from a herd of 57 that went aground a few miles south of Flagler Beach. They ranged in size from 7 to 13 feet and weights up to 1500 lbs. Unfortunately all of them refused to feed and were lost. Pilot whales were also kept alive in 1948 and 1949, one of which lived for nine months.

Marineland of the Pacific

Marineland of the Pacific has finished construction of a new \$500,000 addition. It is a 3,000-seat stadium and pool for trained animal shows. The pool is 120 feet long, 60 feet wide and 15 feet deep with a 60 x 60 stage. Official opening has been set for the third week in June, 1958. The new unit will house the main porpoise show and sea lion acts leaving the present porpoise pool free for local porpoises and the Marineland pilot whale, "Bubbles."

Under the tutelage of Aquarist Dave Brown, Bubbles is now rounding into a polished actor. She dances in a sort of leviathan way, makes assorted and generally obscene noises on cue, which are sarcastically called "singing" by her trainer. She leaps, hurdles and retrieves-objects in the best porpoisian way. Aside from her size and bulk, Bubbles has proven remarkably facile at learning new tricks and is even more gentle than the best of gentle porpoises.

Ocean Park (California)

The only thing left intact on Ocean Park pier is Lawrence Welk's bubble bath ballroom. Everything else is being ripped out and rebuilt with funds from the Columbia Broadcasting Company and the Los Angeles Turf Club. The amount being spent is thought to be somewhere between 7 and 9 million dollars. The "Sea Circus" section is under the guidance of Ross McBride and will contain several porpoise and marine mammal tanks as well as one large tank devoted to dual Martine-designed diving bells. "Neptune's Kingdom", another section, is a fabulous dry land aquarium in which giant models of underwater organisms move about in a natural manner with the aid of hidden motors.

Seaguarium (Miami Florida)

Lots of activity at this place, including a new shark feeding show in the large shark channel. Present emphasis is on bringing in large fresh water fishes for the fresh water section of Seaquarium. One garbled press account in west coast papers indicated that a tumor operation on a 500-lb. jewfish had yielded, among other things., a 5-lb. diver's weight from the stomach. Ha!

Scripps (Wayland Vaughn) Aquarium (La Jolla, California)

A new building for experimental aquarium work is being constructed adjacent to the present public display building. Two research projects now in progress will be of especial interest to aquarists: Jenson is using hagfish for heart studies, since the beast is without nerves to the heart. He has worked out a technique for keeping them without developing slime. One to two dozen are kept in a porcelain bucket containing about 21 gallons of water and an airstone. They are stored in a refrigerated room with air temp of about 50 deg. and are fed once a month.

Dr. Paul Saunders is studying the venoms of turkeyfish and stonefish and has come up with some rather startling information which we will hear more about later.

Shedd Aquarium

Latest word from Chicago is that Shedd has about completed work on their new railway car for fish transportation. Perhaps we shall be seeing them in various parts of the country before too long.

Steinhart Aquarium

As mentioned earlier, the Aquarium staff has been involved in a bond issue campaign to rehabilitate the old place --\$1,575,000 -and to make up for the lack of maintenance for the past 35 years. Friends of the Aquarium dug up \$7,000 for the campaign, most of which went for printing. June 3rd showed a final tally of 135,000 "yes" and 53,000 "no." The campaign revolved around children and mother, and theoretically nobody could be against mother! Anyone who expects to be concerned in a municipal bond issue campaign for an aquarium, zoo or museum, might wish to contact the Editor for a list of suggestions.

Lungfishes are of considerable interest to the SA staff. For one year we kept two African lungfishes (each 1211 long) in the same 150 gallon tank, and this you are not supposed to be able to do. Then one day the smaller chewed the daylights out of the larger, and after that we could never put them together again with out a fight. Later, one of the Africans broke through a saran screen into another section of the tank, and quickly killed a South American lungfish. A letter from Don Fry from the Lake George area of eastern Africa tells that the natives are very much afraid of the bite of the lungfish, and that at times it is a bit difficult to get them to do seining for this reason. Incidentally, Steinhart Aquarium has two of the four African species (Protopterus annectans and dollei) but lacks P. aethiopicas and P. amphibius. If you have either of these latter and wish to trade, please let us know.

Vancouver Aquarium

This new Aquarium, located in Stanley Park, has already become one of the city's leading attractions. At 8:30 P.M. on Friday, March 21, 1958, they experienced something that all of us shudder about — the one—inch thick, non-tempered glass in the largest tank (12,000 gallons) broke and spilled water and fish into the corridor. No one was hurt and most of the fish were saved. Depth of water in the tank has been altered to provide a greater safety factor for the future.

III. MIMEOGRAPHED PUBLICATIONS OF INTEREST (Write for copies)

"THE MARINER", a monthly information leaflet of the activities-at Marineland, Florida. Write to F.G. Wood, Jr. Marineland, Fla.

Vancouver "AQUARIUM NEWSLETTER", a monthly information leaflet of the activities at the Vancouver Public-Aquarium. Write to Dr. Murray Newman, Curator, Vancouver Public Aquarium, Stanley Park, Vancouver, B.C.

"THE T. WAYLAND VAUGHN AQUARIUM-MUSEUM" a 49-page booklet describing the construction and other features of-this outstanding aquarium. Write to Sam Hinton, Curator, Vaughn Aquarium, Scripps Institution of Oceanography, University of California, LaJolla, Calif.

IV. LITERATURE REVIEW

The following papers are recommended for reading by anyone with problems in these fields:

Lackey, James B., 1956. Some visibility problems in large aquaria, I. Plankton problems at Marineland. Quart. Journ. Fla. Acad. Sci., vol. 19, Pt. 42 p. 259-266.

Lackey, Elsie Wattie, 1956. Some visibility problems in large aquaria, II. A bacteriological study of the sea water used in Marineland. Quart. Journ Fla. Acad. Sci., Vol. 19, Pt. 43 p. 267-273.

These authors found that water turbidity was due not only to debris of small size, but also to bacterial blooms, with the food particles in the tank forming a good growth medium for the bacteria. Of interest is the conclusion that "bacteria and other microorganisms present in the tanks will have a tendency to develop an immunity for the copper treatment."

Gilbert, Perry W. and Wood., F.G., Jr., Method of anesthetizing large sharks and rays safely-and rapidly. Science, Vol. 126 No. 3266, p. 212-213, Aug. 2. 1957.

The authors report good results using MS 222 (meta-aminobenzoic acid-ehtylester in the form of methan-sulfonate) at a concentration of 1/1,000 (1 g of MS 222 in 1 liter of sea water). The material is sprayed over the gills with a water pistol while the elasmobranch's head is held out of the water. Effectiveness within 20 seconds can be achieved by using proper dosage, dependent upon size and species of elasmobranch. Four genera of sharks and two genera of rays have been tested, and in no case has the test animal shown harmful effects from the tests. They suggest that 222 may prove useful in capturing large fish.

Scholes, P., B.A. Three reasons for sudden mortalities in marine tanks. From The Aquarist and Pondkeeper, March 1957, Vol 21, No. 12, p. 266-267.

Mr. Scholes starts his article by expressing considerable amazement that <u>any</u> marine animals live for any length of time in small marine aquaria. He gives three reasons for sudden mortalities in such tanks as: 1. Excessive bacteria; 2. High CO2 content, and 3. Changes in pH from a normal alkaline reading to an acid one.

We all know that these factors can be lethal, but Mr. Scholes' explanations of how they come about are not only extensive but in some instances unique: (Increased surface area of tanks vs. natural habitat offering increased living space for epiphytic bacteria).

Perhaps the same could be said of Mr. Scholes' remedies for these evils. 1. Feed sparingly and remove all excreta. 2. Elimination of high CO by installing a scrubbing tower with baffle plates plus the introduction of such marine plants as <u>Ulva</u> and <u>Enteromorpha if</u> they can be induced to grow, and, finally, 3. the addition of sodium bicarbonate-to keep the pH on the alkaline side. This latter, Mr. Scholes admits, will take considerable titrating of an experimental nature before the proper amount can be determined.

V. SPECIAL NOTES

Control of Foam on Sea Water

Leo Allison
Michigan Department of Conservation

We recommend Dow-Corning A.F. emulsion for the control of foam on sea water. Normal usage is one-ounce of 10 percent solution per 100 gallons of sea water.

The cost is about \$2.85 per pound. Boyd Walker UCLA) has also used it and finds it very satisfactory.

Lindane Insecticide for Argulus Treatment

Keith R. Kreag Zoological Curator Detroit Zoo and Aquarium

Few people in the Aquarium field in America have used the simple but thoroughly effective treatment for <u>Argulus</u> first reported in the Proceedings of the London Zoological Society for May, 1949, p. 81 by Hindle.

This treatment consists of a one to ten million solution of pure lindane in the aquarium tank. Lindane is insoluble in water, but a 10% solution in absolute alcohol-makes It possible to introduce it into the tanks. It is a quick and thorough treatment. There have been no signs of injury to any fish-that we have treated, which have included alligator gar, muskellunge, northern pike., lake sturgeon, long nosed gar, flat headed catfish, golden shiners and lake emerald shiners.

On-Synthetic Plants for Aguarium Use

Don Simpson Steinhart Aquarium

Now in this wonderful age when everything from vitamins to clothing is being made synthetically, aquatic vegetation has joined the parade. A rash of manufacturers are churning them out in great shape - in fact, <u>all</u> shapes and colors. Some of them are Strictly for the birds (not the fish), being a bit on the weird side and

looking somewhat like the decorations on the old ladies' hats. However, there are some of them that have duplicated natural aquatic foliage and are a godsend to dressing up not only salt water tanks but those in fresh water containing fish that eat ordinary aquatic shrubbery like a rabbit going through a bunch of carrots. See current aquarium magazines for the names of dealers in this fake horticulture.

VI. SHORT ARTICLES

The Collection of Intertidal Fishes or How to Scuff Your -Shins, Drown, and Swear at the-Same Time

William McFarland Marineland of the Pacific Marineland, California

In the aquarium business the collection of fishes for display is forever with us. Small species are as important and often as difficult to obtain as larger forms. The ability of these fishes to hide in cracks often makes them unavailable to the collector. Any device, therefore which enables one to increase collecting effectiveness warrants attention. The usual method for obtaining tidepool fishes has involved abounding courage, fortitude,, wine, and plain-hard work. These qualities are certainly still a requirerequisite, but this writer has found that several agents are capable of easing considerably the plain hard work.

One compound, a heavy alcohol, called Tertiary amyl alcohol, has been used with success. A large number of California intertidal species from the countless Opal eyes to the secretive Eel Blennies have been obtained using this compound. The following procedure generally has been followed:

- (1) A suitable tide pool is located. It should be cut off from the sea at low tide and not too large (about 200 300 gallons at most).
- (2) Approximately one gallon of tertiary alcohol is used for every 100 gallons of sea water. More can be used if desired. Less will work, but it takes longer and unless one is adept at swimming a reef on an incoming tide, it is not recommended. If a strong but pleasant sweetness can be detected over the pool (after mixing) you probably have enough. From the extreme accurateness of this method it can be discerned that one cannot be too quantitative.
- (3) Stir the alcohol into the water with a small dip net or your hands. Attempt to wash the water into the cracks in the rocks. One can then sit on a rock for ten minutes, smoke a cigarette, drink wine and meditate about nature. At the end of this period, the fish (like the collector) should be entering a comatose state of alcoholic demeanor.

- (4) Tear the tide pool apart looking for fish. They are slowed to the point where they can be netted easily. Immediately place them in a bucket of fresh sea water which was obtained prior to use of the alcohol (the tertiary alcohol). They should recover rapidly and appear normal after about 10 20 minutes.
- (5) Remake the tide pool, fortify yourself once more and go home.

One of the advantages of this alcohol is its generally negative action on the invertebrate fauna with the exception of the molluscs. Octopus come out of their lairs and can easily be collected. The success of the method is attested by the fact that I have collected specimens in the company of friends from reefs at 2 o'clock in the morning. This approach is not recommended, to be sure, but without the alcohol (you guess which one), it would be utterly impossible.

Tertiary amyl alcohol can be obtained from the Eastman Organic Chemical Company, Rochester, New York. At the last accounting its cost was \$2.50 per gallon when bought in 10 gallon lots. The wine can be obtained at any disreputable market for a lesser amount. It is expensive to collect a pool, but the ease of obtaining and the return of specimens has more than compensated for the cost.

A word of caution. Since the method involves the use of a chemical, it is advisable to first check with your department of fish and game. They should issue you a special permit for restricted use in tide pools. I wish good collections and a happy time to one and all who partake of this kingly sport.

The Use of Neoprontosil Azosulfamide in Treating Abrasion-Induced Blindness in Marine Fishes

Craig Phillips Miami Seaquarium Miami, Florida

In the course of collecting marine fishes for exhibit, particularly when nets, wire traps, or other devices come into harsh or continued contact with the bodies and eyes of the specimens, a temporary blindness often results due to a clouding or milky thickening of the cornea of the eye. In the normal course of events, infection frequently sets in, resulting in permanently damaged eyes, death, or at least the loss of the specimen as an effective exhibit. I have found that early local application of 5% aqueous solution of Neo-prontosil axosulfamide (which is carried by most veterinary physicians) will usually halt the progress of the infection and restore sight and normal appearance to the eyeball within a few days. The procedure of treatment is as follows:

The fish is immobilized in a soft net or shallow tray and the clouded eye carefully cleaned of excess slime with absorbent cotton or tissue paper. Then the Neoprontosil solution is applied directly to the eye with a medicine dropper or a watercolor brush, the latter being my preferred method. Care must be taken to keep the solution

away from the fish's gills insofar as possible, as it is quite toxic when it comes in contact with the gill tissues. The Neoprontosil will stain the eyeball a deep ruby-red, and restoration of sight will usually accompany the gradual loss of this red color) which may take several days. One application usually does the job, provided the infection is not advanced, but repeated treatments may be given if necessary. I have also found Neoprontosil of considerable help in treating damaged fins or other bodily injuries, particularly in places where the scales or skin have been rubbed or bruised in handling.

Some Notes on the Compulsive Behaviorism Of an African Mormyrid of the Genus Gnathomenus

Donald Simpson Steinhart Aquarium

Some two years ago Steinhart Aquarium acquired a single 3 1/2" specimen of the African Mormyrid, <u>Gnathomenus petersii</u>, which, though not large, put a large dent in our fiscal budget.

This specimen placed in one of our tropical room display tanks promptly earned for himself the title of "Schnozola", due to what is apparently a long rubber nose but is actually a protrusion of the lower lip. It is round, about 3/4" long and reminds one of the rubber daggers purchased in the "joke" shops. But it is no Joke; the things Schnoz can do with that proboscis....man!

First we gave him two catfish (<u>Corydoras</u>) to do a little Janitor work in the tank. Took him about two days to make a bloody mess of the cats. Next he concentrated on a beautiful plant (<u>Apotogeton ulvaceus</u>), a relative of the Madagascar lace plant - but without the holes. Schnoz evidently preferred the holes, which he promptly took care of, leaving the plant resembling a Swiss cheese. Left it like that for a couple of days and then wrecked it completely.

So I tried to out-fox him. Gave him a tough plastic plant with leaves securely fastened to a plexiglass stem. This took longer but he made it. Knocked every leaf off.

Three little pieces of colored glass he pokes all over the tank, sometimes burying them in the sand. And when I feed him brine shrimp, he bats each one up before chomping it like a tennis player making a fast serve.

About all that is left in the tank now is a ceramic hippo that, so far, he hasn't been able to wreck.

But give him time. He'll make it eventually.

Octopus Appolyon Shipping Test within A Sealed Container

Robert P. Dempster Steinhart Aquarium

An octopus that had been in captivity for about two months was used in a test to determine its ability to survive a given period in a closed shipping Container. It had been caught in Monterey Bay at a depth of between 500 and 600 feet and weighed about 20 pounds. The sex was not determined. The test was started at 9:00 A.M. and completed at 9:00 P.M. on the same date, and the octopus was returned to the display tank immediately after the test. Eleven gallons of 50 deg. F. seawater were placed in a plastic bag within a 55-gallon fiberboard drum approximately the way in which an octopus would be shipped by air. Since the oxygen and carbon-dioxide tests of the water within the container required the removal of a water sample at the intervals indicated in the table below, there was actually about 10.5 gallons of water remaining at the end of the 12-hour test in the plastic bag. The space available, above the octopus and water, was filled with commercial oxygen. The volume of oxygen in this space was about 135 liters or approximately equivalent to the volume that would be filled by 36 gallons of water. It will be noted from the table that the water was supersaturated with oxygen at the beginning of the test. This was accomplished by bubbling oxygen through the water for a 15-minute period before the test.

TIME	TEMPERATURE	DO.	CO	
INTERVAL	FAHRENHEIT	PPM	PPM	<u>pH</u>
Before Test	50°	20.4	6.16	7.5
10 Min.	50°	19.5	_	7.5
5 Hrs.	55°	8.4	17.60	_
10 Hrs.	57°	4.9	26.40	_
12 Hrs.	58°	3.6	29.14	6.6

At the end of the 12-hour run the octopus was quite weak, and the water was cloudy. When put back into the main exhibition tank respiration became more normal, but the arms did not move in manner indicating healthy condition. Four days later the octopus succumbed. Buildup in CO_2 concentration was probably responsible for the demise, although it might have been due to a combination of low oxygen, high CO_2 , acidic pH and increased temperature. Future tests with buffered seawater should determine the importance of these factors. It should be noted that temperature is not a lethal factor until the 65-70 deg. range is reached.

Three previous runs of 12 or more hours have been made with 20-30 lb. Octopus apollyon in a closed shipping container. The first was in the Steinhart laboratory about March, 1955. The octopus survived without indication of after effects. The second octopus was taken by Earl S. Herald to New York for a television program; it was reoxygenated halfway through the flight and was in good shape upon arrival at the New York airport. Two days later it was lost due to inadequate seawater. The third octopus was shipped from San Francisco to Daytona, Florida (1957) - a 15-hour trip, and the

octopus did not survive. In none of these were oxygen or carbon dioxides taken.

VII. FISH AND OTHER EXCHANGES

Let us know what you have in surplus and can ship in good condition, and what you would like to have in return. To start it off, Steinhart Aquarium offers leopard sharks which take a temperature rang of 50-75 deg. and live in about any quality of salt water. What do you offer?

VIII. MISCELLANEOUS

Marine Tropical Fish Shipment Checking Service

One of the biggest bugaboos in shipping marine tropicals has been that on extended flights, someone who knew something about fish should have looked at the shipments at various stopping points. A service of this type has been started at the San Francisco airport by Paul M. Bruns, ichthyological student of the Natural History Museum at Stanford. At the request of the shipper, he checks shipments upon arrival, including pH, temperature, specific gravity; lists by species, and removes the dead fishes and reoxygenates for further shipment. S ervice of this type has long been needed, and when it can be established at all major airports it will work to great advantage for all concerned.

Admittance Fees for Nineteen West Coast Aquariums and Diving Bells

Bill Kelley is accumulating data on admittance fees for all U.S. Aquariums and, with his permission, we hope to list all of this at a later date. In the meantime, since there has been a lot of interest in this matter, the following data are submitted on the western aquariums:

BRITISH COLUMBIA						
	Adults	Children				
Vancouver Aquarium, Stanley Park	.25	.05				
WASHINGTON						
Westport Aquarium Hoodsport Aquarium Tacoma Aquarium, Pt. Defiance Park	.45	.25 .25 .05				
OREGON						
Seaside Aquarium Depoe Bay Aquarium	.50	.25				

	Adults	Children
CALIFORNIA		
Crescent City AquariumSteinhart Aquarium, San		.25
Fisherman's Wharf Aquarium, San Francisco San Francisco Diving BellSanta Cruz-Aquarium (City Pier)	.25 .30 25	.15 .30 .10
Monterey Aquarium (Old City Pier)	.30 .85	.15 .30 .35
Marineland of the Pacific, Calif	2.00 1.00 on	.90
HAWAIIAN ISLANDS		
Waikiki Aquarium	25	.00

PAN AMERICAN WORLD AIRWAYS REPTILE - AMPHIBIAN SHIPPING REQUIREMENTS

Until very recently Pan American required excessive weight in certain amphibian and reptile shipments, so that the aquarium or zoo receiving the material often expended much more for the shipping container than for the actual weight of the animals contained inside. Light weight metal containers were not acceptable to Pan American. However, this is now to be changed in new regulations for their shipping service so that aluminum and other light metals will be acceptable shipping containers.

See you at the Aquarium Symposium. If you wish to make a speech, send in the title. Above all, bring your new ideas and be prepared to defend-them. All knives and derringers will be collected at the door. Also, please send to Ye Editor any news you would like to see in the next issue of DRUM AND CROAKER.

Adios!