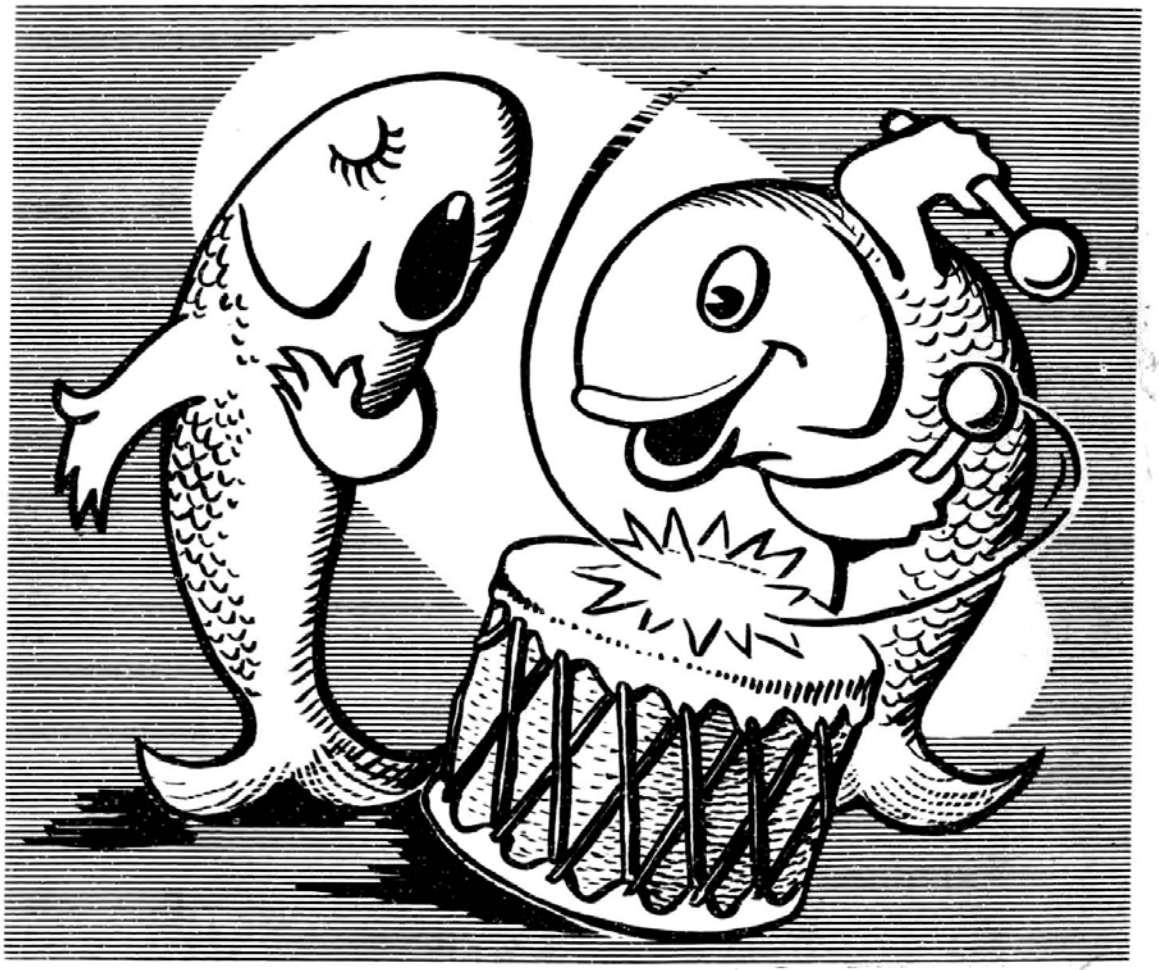
The DRUM and CROAKER

A Highly Irregular Journal for the Public Aquarist



DRUM AND CROAKER

An informal, irresponsible, unedited unexpurgated, self-styled voice of the Professional American Aquarist and the Aquarium Research Science Endeavor. Conceived in sinful New Orleans in 1957 and baptized by total immersion in bourbon and scotch in a solemn ceremony held in a smoke filled room, the D & C has grown from a humble proposal for an aquarist's journal to be called the "Grunt and Crappie" to its current position of strength as a meager light in the dark ocean of aquatic science.

This-issue perpetrated by:

Bill Kelley
The Cleveland Aquarium
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DRUM AND CROAKER
June 1, 1963

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OBSERVATIONS FROM UNDER THE RIGHT GILL COVER

The National Aquarium is now under way officially with an advisory committee complete except for one name. Athelstan Spilhaus, Dean, "School of Engineering of University of Minnesota is chairman. No aquarist yet appointed to this advisory committee.

A new translation of Aritsune Saeki's paper "Studies on Fish Culture in the Aquarium of Closed-circulating System, Its Fundamental Theory and Standard Plan" is nearly ready fo~ distribution according to a note from Bill Friend, Zoology Dept., University of Toronto.

Construction of a marine exhibit addition to the Dallas Aquarium is under way.

Who uses "aquarian" as an adjective meaning "pertaining to aquariums"? "Aquariist" instead of "aquarist"? See your unabridged.

The "wet-set", cream of the Aquarium Research Science Endeavor, will base their predation on the Vancouver community at the Sylvia Hotel during the upcoming meetings.

Important paper for aquariists: "Calcium Carbonate: Factors Affecting Saturation in Ocean Waters off Bermuda". Robert Schmalz and Keith Chave, Science, 22 March 1963, pp. 1206-1207.

Unimportant paper for aquarists: "How to Build and Maintain Aquariums for Organisms that Live in the Ocean", in The Amateur Scientist, Scientific American, Nov. 1962. Lars Carpelan of University of California sets some sort of record for professional naivete in the "Rube Goldberg" he proposes as a marine aquarium system.

Don Wilkie has left Vancouver for the job of Curator at "Aquarama" in Philly.

Something must be done to keep our very able "Bibliographer Aquarist" Jimmy Atz employed in the aquarium field. See note of termination of-his employment at New York Aquarium.

A look at Lake Nicaraguan sharks and sawfish in March convinces me that no important difficulties will be encountered in collecting and exhibiting these animals. All sharks examined corresponded well with the morphological characters for Carcharhinus leucas.. See note by Bigelow and Schroeder in Copeia, 1961, No. 3.. Twelve inch total length sawfish were common.

AQUARIUM SYMPOSIUM

American Society of Ichthyologists and Herpetologists

University of British Columbia

Vancouver, Canada

Wednesday, June 19, 1963

AFTERNOON SESSION

William Braker, Shedd Aquarium, Chicago, 15 min., 35 mm slides, "Report on 1963 collections in Hawaii."

Cecil Brosseau, Tacoma Aquarium, 15 min., 35 mm slides, "A circular plan, the new Point Defiance Deep Sea Aquarium."

Burton Clark, Miami Seaquarium, 10 min., "Certain aspects of aquarium management."

Abstract: Public aquaria are filling a rapidly increasing request for information, both scientific and non-technical, for educational aids and for assistance even to the extent of physical cooperation. These requests come from individuals students at all levels, school groups and even entire institutions.

Aquaria are finding that intensified exploration of both marine and fresh water resources presents an opportunity and an obligation to cooperate and to assist individual research projects and the programs of purely scientific institutions.

The problems presented by these phases of development and their solutions are a function of aquarium management. The solutions are important to all aquaria, particularly to those that are large and that are becoming more well known as time passes. They have economic consequences of considerable scope.

Aquarium management must investigate and evaluate proper policy and implementation of an effective program to provide these solutions.

L. C. Finneran, New England Aquarium, Boston, 10 min., "Educational exhibits planned for the New England Aquarium."

Perry W. Gilbert, Cornell University, 20 min., 16 mm sound speed (silent), Kodachrome motion picture, "Technique of handling and operating on sharks of medium and large size."

Capt. W. B. Gray, Miami Seaquarium, 25 min., 16 mm motion picture, "The capture of the white porpoise."

Abstract: The motion picture shows the capture of the albino porpoise (Tursiops truncatus) which as far as can be determined is the only one ever captured. It is doing nicely in captivity at the Miami Seaquarium.

William E. Kelley, Cleveland Aquarium, 15 min. "Ideal configurations for a semi-closed circulating aquarium system."

Abstract: A set of values for the various design considerations of a semi-closed circulating aquarium is offered wherein:
1. The ratio of water volume to living animal weight is one hundred gallons to one pound.

2. The turnover rate of the system through the filter is once per hour.

3. The ratio of filtrant volume to animal weight is one cubic foot to one pound.

4. The flow rate through the filtrant is one gallon per square foot of surface area per minute.

5. The filtrant consists of two to five mm. grains of silica gravel in fresh water systems*

6. The filtrant consists of 75% silica gravel of two to five mm. grains and 25% calcareous gravel of two to five mm. grains in sea water systems*

These design parameters are discussed critically with respect to ammonia and carbon dioxide as the chief limiting factors in aquatic animal culture.

James Land, Oakbay Aquariuml Victoria, 15 min., 35 min slides, "A new concept in aquarium construction and exhibition

Abstract: A floating, aquarium was launched on Vancouver Island in May, 1963. Visitors view surrounding water through glass windows in a submerged room. Specimens are restricted to areas near the viewing windows by netting,

Murray A. Newman, Vancouver Public Aquarium, 15 min., 35 mm slides, "A pictorial review of some of the world's great aquariums."

Abstract: A number of aquariums in Canada, United States, Denmark, Germany, England and Japan have been visited by staff members of the Vancouver Public Aquarium. Modern trends in aquarium design are toward diversification of exhibits, the presentation of information in various forms and the Inclusion of varied aquatic animal groups other than fishes.

Ross F. Nigrelli and Henry Vogel, New York Aquarium and Bureau of Laboratories, New York City Department of Health, 15 min., 35 mm slides, "Tuberculosis of fishes and other cold-blooded vertebrates with special reference to Mycobacterium fortuitum from fish and human lesions."

Abstract: A survey of fishes in the New York Aquarium, and search of the literature, shows that tuberculosis in cold-blooded vertebrates is more prevalent than may be suspected. The disease was reported in more than 140 species of fishes, 12 species of amphibians and 12 species of reptiles.

In the New York Aquarium, tuberculosis was found in more than 30 species of fishes, especially in tropical freshwater forms of the families Characidae, Cyprinidae and Poeciliidae. Of special interest is the discovery that the acid-fast bacillus isolated from the Neon Tetra, Hyphessobrycon innesi. is identical with Mycobacterium fortuitum, a species originally isolated from human lesions in South America. In stenohaline fishes in the Aquarium tuberculosis commonly occurs in clownfishes (Pomacentridae), inhabitants of Pacific coral reefs.

The pathology, methods of identification and isolation and classification of acid-fast bacilli will be discussed.

EVENING SESSION

Kenneth S. Norris, U.C.L.A., 10 min., "Progress at the Mission Bay Oceanarium and the Oceanic Foundation - Sea Life Inc. complex at Hawaii."

Abstract: Progress on the construction of two new and radically different oceanaria will be described. The Mission Bay facility features animals held in a natural embayment, plus a truly underwater theatre. The Hawaiian oceanarium. includes a unique water system, a coral reef, underwater TV and other innovations, plus a large-scale oceanics research installation supported in part by the oceanarium itself.

Craig Phillips. National Aquarium, Washington, D.C., 15 min., 35 mm slides, "Progress of the new National Fisheries Research Center and Aquarium."

Abstract : Plans for the new National Fisheries Research Center and Aquarium will be discussed with emphasis on purpose and latest developments.

John H. Prescott and David C. Powell, Marineland of the Pacific and Steinhart Aquarium, 10 min., "Air embolism and gas supersaturation problems in public aquaria."

Abstract: Gas embolism associated with air supersaturation has been found to cause mortality in fishes at Marineland of the Pacific and Steinhart Aquarium. In both of these institutions we have been able to establish that air dissolved in water under pressure causes one type of gas embolism (bubble disease) fatal to fishes. Air entering a system under pressure saturates the water at that pressure according to the combined gas law where $(P_1V_1)/T_1 = (P_2V_2)/T_2$. After the pressure is released, i.e. the water flows from a pipe into an aquarium tank, the amount of gas dissolved is then in supersaturated condition. Fishes exposed to the supersaturation will gradually reach an equilibrium state with the water and the gases in the blood will be in a state of supersaturation. Because of the supersaturation the gas will bubble in the water and in the blood vessels of the fishes. The resultant bubbles create embolisms in the vessels and subsequent mortality of the fishes.

Air generally enters the water system through malfunctioning pump packing or as in the case at Marineland whan the water level in the sea water well falls below the intake level

R. M. Segedi, Cleveland Aquarium, 10 min., "Some notes on anaerobic bacterial activity as a source of toxicity in aquarium."

Abstract: Some toxicity problems in aquarium tanks have been related to the activity of anaerobic bacteria in areas of poor circulation in the aquarium substrate. Blackened particles of substrate and the evolution of H_2S are symptoms of such activity.

I have observed other sources of such toxicity wherein immersed surfaces are in poor contact and an enclosed narrow volume of water does not circulate. Common sources of such trouble are old aquariums in which the tank glasses, frames and glazing compounds have become unsealed. Similar areas develop under tank liners and coatings when they separate from the interior tank surfaces. Rocks, ornamental objects or any other situation that will harbor a volume of uncirculated water may lead to this problem.

Elmer Taylor, Calgary Aquarium 10 min, 35 mm slides# "Transporting sea water to an inland aquarium."

Abstract: Ways and means of transporting sea water from Pacific coast across the Rocky Mountains to the prairies. This was done by means of road and rail transport utilizing a collapsible neoprene rubber container to reduce two way transport costs and utilizing non-corrosive containers.

James A. Thompsen, Tube Turns Plastics, Inc., 10 min., "The use of UPVC piping systems."

Donald 'A, Wilkie, Philadelphia Aquarama, 10 min., “Techniques employed in transporting octopus specimens.”

Abstract: Various techniques have been employed in transporting octopus specimens from the Vancouver Public Aquarium to other institutions. Specimens were cooled to within several degrees of freezing and shipped by plane in insulated plastic bags. Some difficulty was encountered when seawater was not enclosed in the bag.

RECENT PUBLICATIONS OF INTEREST TO AQUARISTS

Fishes used to be a neglected subject as far as books were concerned, especially popular ones. This is certainly not the case these days. Moreover, the number of ichthyological technical publications now is steadily increasing, even including a few by and for professional aquarists.

Volume A of the published proceedings of the First International Congress of Aquariology was received here in November, just two years after the Congress had been held in Monaco. The Institut Oceanographique at Monaco has published a good-looking, 163-page book, well edited considering that it contains articles in three different languages: 11 in English, 6 in French and 3 in German. There are three more volumes to come. Let us hope they are not as long in appearing as the initial one!* The present volume contains articles on the maintenance in captivity of the Harbor Porpoise, Harbor Seal, various sharks, delicate schooling fishes, Dascyllus aruanus, the John Dory and Red Bandfish, and a European squid and octopus. In my opinion, the paper by H. G. Veevers, who is in charge of the London Aquarium, on the water conditions required to keep octopuses is the outstanding article in the book, and a solid contribution to the new science of Aquariology --- whose establishment is the avowed purpose of this series of publications. Four of the articles deal with the treatment of diseases of captive coral reef fishes, which is evidently as provocative a subject in European aquariums as it is in North American ones . Finally, there are some general articles on the maintenance and transportation of both freshwater and marine fishes. Naturally, some of the articles are better then others; in fact, some of them are pretty thin. Nevertheless, the book as a whole is worth having and should be in the library of every aquarium. Some of its technical information is of obvious value, and here and there are tidbits of considerable interest (for example, D.P. Wilson'S observation that a species of pipefish can act as a parasite-picker on the John Dory). Someday, however, I want to-meet the two Philippine fish hobbyists who told Dr. Villadolid that they breed coral reef fishes.

Just off the press is a small book on "Maintaining Fishes for Experimental and Instructional Purposes" by Dr. William E. Lewis, Professor of Zoology and Director of the Fisheries Research Laboratory at Southern Illinois University (Southern Illinois University Press, Carbondale. $5.00). Dr. Lewis Is obviously a man who has gotten his hands wet, and even experienced aquarists will be able to pick tip a few useful ideas from his book. On the other hand, most of us would be able to give Dr. Lewis some "pointers" as well, and many of us have unquestionably had a good deal more experience to draw upon than has the professor. The fact remains, however, that he has gathered his thoughts together and written a manual on fish

* Volumes B and C have arrived as of this issue of D & C. --- Ed

keeping --- something that none of us has yet been able to do. This, too, is a book that should be on your reference shelf, if for no other reason than to have readily available its appendix of really useful tables and also a primer to recommend to biologists or semi-professionals who want to commence to keep freshwater fish. Unfortunately the book shows signs of being hastily put together, what with misspelled scientific names and bibliographic references to items not to be found in the bibliography.

Dr. Lewis provides a short but useful account of diseases and parasites commonly encountered among freshwater fishes. Another useful summary of this subject, covering both freshwater and marine forms, may be found in the new (second edition) Merck Veterinary Manual (Merck & Co., Inc., Rahway, -N.J.). This eight-page item was written by Dr. Ross F. Nigrelli, Pathologist of the New York Aquarium, and is as concise and inclusive a description of fish diseases as can be found --- at least in the English language,

Sam Hinton's long awaited survey of the longevity of fishes in captivity has at last appeared --- in Zoologica, the scientific journal of the New York Zoological Society (Vol. 47, Part 2, pp. 105-116. September 15, 1962). In it, Sam lists 307 species that have lived five years or more in captivity. The oldest fish was a sturgeon kept for nearly 70 years in the Amsterdam aquarium --- which, incidentally, posted the greatest number of records: 95 different species, most of them tropical, freshwater forms. Sam's introductory analysis and comments make fascinating reading, and the editor even allowed flashes of his great sense of humor to get through. Reprints ought to be available from Sam at the Scripps Institution of Oceanography at La Jolla.

Another recently published book of interest to aquarists is the text "Ichthyology" by Lagler, Bardach and Miller (John Wiley & Sons, Inc., 440 Park Ave. South, N.Y. 16). I hesitate to recommend it unreservedly, however, because there may not. be $12.50 worth of value in it for most of us. At any rate, it's a good publication to know about, because a reference to it could sometimes get you "off the hook" on which some budding-or would-be Ichthyologist has Impaled you.

My unreserved recommendation, however, goes out for "The Life Story of the Fish" by the late Brian Curtis. This is, I am convinced, the best popular account of fishes ever published in English. It can now be purchased for only $1.50 from Dover Publications (180 Varick St., New York 14, N.Y.).

Finally, those of us who specialize in tropical, freshwater fishes may find C. F. Hickling's "Fish Culture" of interest and some help. Dr Hickling has had a great deal of experience in British colonies and excolonies, and he has also drawn widely on the work of others. There must be some applications to be made from all this aquicultural effort to aquarium management! The book was recently published by Faber and Faber (24 Russell Square, London, W.C. 1) and costs 45 shillings.

James 'V. Atz, Malverne, L. I ., N.Y.

Jim Atz is no longer Curator at the New York Aquarium. On February 21, 1965 the New York Zoological Society terminated his services with that institution. Jim had been with the Aquarium since 1937, and through the years had served as Laborer, Tankman, Laboratory Technician, Assistant Curator and Associate Curator, as well as the Aquarium's second-in-command. Director Chris Coates was due to retire in May of 1964, but it now looks as if Chris will have to carry on indefinitely. --- James W. Atz

A MANATEE EXPERIENCE

In April 1960 we received a South-American freshwater manatee or sea cow flown from Georgetown, British Guiana. It was immediately placed in our largest indoor tank which is an 8000 gallon glass fronted exhibition aquarium approximately 20 feet long by 12 feet wide and 4 feet deep.

Retained with the manatee was a 3 foot American Paddlefish for which no other suitable aquarium was available. This is probably the most remarkable part of the story, as the sifting habits of the paddlefish and the bovine excrement of the manatee would not normally be considered compatible. The beaked one, however, did survive the ordeal.

Water temperature ranged from 75 0 to 800 F. during the period the manatee was kept. Food accepted was one bushel of head lettuce, one quarter bushel of spinach, and two bunches of celery daily, divided into two meals. The celery and lettuce were broken up and floated on the water surface. The nature of the food and the animal's chewing it made a very dirty tank which needed constant cleaning.

Our filtering system is of the overflow, gravel, cloacal type and to prevent too much vegetable matter from escaping an oversized feeding ring was made of canvas and stretched across one corner of the tank. Our filter was not effective in keeping the water clear as manatee dung appeared in large quantities and rested on the tank bottom where it had to be netted out. Daily siphoning was necessary to clear out smaller particles of excretia and uneaten food. Feeding and cleaning took a minimum of two hours daily. This was all right for about four months when the manatee started with very loose bowels. This resulted in our whole water system smelling like sea cow. A diatomaceous earth filter of 40 gallon per minute capacity was purchased and put to work on the manatee tank and proved to be quite effective, although siphoning still had to be continued.

One Sunday morning in September 1960, while being observed, the manatee slowly sank In its water, gave a shudder, expelled a couple of air bubbles and quietly died. This ended the story of a 5 foot, 180 pound male manatee called Minnie.

In capture the animal received severe rope lacerations which responded slowly to Acriflavin treatment. Pathology showed that cause of death was Edema and other complications probably due to the manatee's habit of resting in a bent attitude with head and tail downward, resulting in skin folds blocking the urogenital opening. If this was indeed the case, I would urge anyone attempting to keep this animal to provide it with a resting, ramp.

Max Hofmeister, Toledo Zoo Aquarium, Toledo, Ohio

Note

The Naked Goby, Gobiosoma bosci, Fin Nipper Extraordinary

My next door neighbor is an energetic and somewhat excitable gentleman. About two months ago he came over to my house loud and voluble about a little "monster, cannibal", etc., which he had picked up while bailing out his boat in a nearby salt water bayou and placed in his home aquarium. "He looks like a tadpole. He stands tip on his two front flippers." I, of course, could tell nothing from this description but I went over and examined his aquarium. It contained two fresh water angelfish, a couple of Gambusias taken locally, three barbs, several black mollies and a few plain ones. There was also one goldfish and a female Siamese fighting fish. The little monster lay on the bottom and occasionally made forays at anything that passed in his vicinity. The angelfish and the goldfish were untouched, but the mollies and the barbs had been nipped. The worst sufferer was the Siamese fighting fish. Its tail fin had been virtually chopped off and the little fish cowered In a far corner behind a rock and the aquarium wall.

I could see that the fin nipper was a little naked goby but could not make out whether it was G. bosci or robustrum. My neighbor explained that he brought the thing in because he was "cute" and dropped him in the aquarium. The fish stayed on the bottom and there were so signs of depredation until about a week later. I suggested that he feed It some chopped meat, but he said he wanted the little so and so out of there. Therefore, I took it out and brought it to the Laboratory where it was identified. It was less than 40 mm. in total length. The distribution of this little goby is from Long Island, New York to Tampico, Mexico. It is a shallow water marine fish and little is known about it except that it is to be found in waters of low salinity. In Texas waters I found them abundant at salinities of 5 to 20 parts per thousand, and common in grassy areas. Considerable numbers were eaten by black and red drum. The maximum size recorded is 64 mm. total length.

A fairly close relative, Gobiosoma ginsburgi, extends from Woods Hole, Massachusetts to South Carolina and possibly considerably beyond. A cognate species to ginsburgi, G. longipala, is known from the CaIoosahatchee River and Tampa Bay area of the Florida Gulf coast. A fourth species, G. robustum is known from the Florida east coast, to the northern Gulf coast, Mexico and Brazil. Lesser known species are found in south Florida, the Indies and South America. These fishes are all naked and scaleless except for two scales at the base of the tail in G. ginsburgi and G. longipala. Very little is known about these small fishes except their taxonomic status, which was worked out by Isaac Ginsburg. G. bosci has a mouth full of teeth and when hungry it will attack fishes many times its size and bite off as much of them as it can. It is certainly not a good aquarium pet, and probably would be quite difficult to handle in small exhibition aquaria unless kept alone.

Gordon Gunter, Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

LONGEVITY AT THE DALLAS AQUARIUM

Checking back over the years, the records here at the Dallas Aquarium revealed that we now have some "old timers" with us.

The aquarium opened its doors, June.6, 1936, and at that time two alligator gars (Lepisosteus spatula) were obtained locally for display. These gars at that time were each approximately 36-40 inches in length and 7-9 inches in girth. The weight was not recorded when obtained, but today, they are still between 36-40 inches in length and their girth seems to be as it was some 27 years ago, so they have not increased their size. They are housed in a tank 4' deep x 8' wide x 12' long, which is 3000 gallons in size. All these years they have been fed beef heart.

In 1945, the Dallas Aquarium obtained from the St. Louis Zoo, one female Harbor Seal (Phoca vitulina). According to the records, the St. Louis Zoo said this Seal was then around 7 years old. Today this seal is still with us, true she does have cataracts, and on some days her eyes are almost white, but on other days they look normal. This hasn't hurt the Seal in any way, she knows you and responds to feeding, and will go through all her tricks when she knows you are going to give her food. Her tricks consist of shaking hands with the feeder, then getting into the water, and on command do rolls in the water, and also on command jump back on to the concrete slab in the tank. For the record, we know that this seal is at least 24 years old. The other harbor seal on display was an adult in size when obtained in 1948. The tank size is 8' x 12' x 2' of water. Since the day the seals have been placed in this tank, they haven't been removed from same. Each morning the seal tank is drained of all water, scrubbed with a fibre brush, and the glass is scrubbed with bon ami or some other type of powder, using steel wool for the medium of scrubbing the glass. The tank is then completely washed and water pumped back into the tank.

The diet for these seals consist of 10 pounds of frozen whiting which has been thawed and cut into pieces' about 1 - 1 1/2" in length. On Monday and Thursday of each week, four vitamins are given to each seal. These vitamins are inserted into a piece of fish and then hand fed to each, so one can be sure they eat them. The vitamins are as follows:

ABDEC Kapseals	Parke-Davis
Wheat Germs	Rexall
Super D Perles	Upjohn
Brewers Yeast Tablet 6.8 gr.	Squibb

Usually, for a six-week period from about the 2Oth of February until April 15th, the seals go on a hunger strike and they only eat about 5 pounds of fish a day.

Their display tank has water running in and out at all times, so fresh water will carry off the excess matter with the seals pass.

Jeff W. Moore, The Dallas Aquarium.

A SIMPLE AND EFFECTIVE MECHANICAL FEEDING MIXTURE FOR COLD-BLOODED VERTEBRATES

Since most aquariums include amphibians, turtles, and certain other aquatic or semi-aquatic reptiles among their exhibits, various herpetological problems in maintenance and feeding occasionally arise. One of these is the matter of inducing a certain reluctant animal to feed - a thing that does not happen nearly so often with fishes. One contributing factor to this is the very durability of amphibians and reptiles - they may often be obtained in an apparent state of good health after having gone foodless for weeks or even months following their capture, but during which time their digestive processes have become quite dormant from disuse. Also, abrupt chances in temperature, etc. will sometimes throw an animal "off his feed" for an extended period and the longer fasting occurs, the less likely the animal will resume of its own accord.

Zoos that maintain reptile exhibits usually have on hand the ingredients including bone meal, dried blood stock, and the like for artificial feeding, but when the average aquarist considers the time and effort required to round up the apparatus and materials to feed a cadaverous newt or emaciated turtle, a formalin jar is often the simpler solution. I hereby offer a mixture, the ingredients of which are cheap and obtainable on short notice, which my wife and I have used with great success over the past ten years.

Originally, we experimented with ground liver, milk, and egg mixtures, but most of these had a tendency to produce diarrhea in the animals upon which they were tried, and the incidence of recovery was not too satisfactory. Finally, we hit upon the highly successful combination ratio of one small jar of cooked, strained baby food (strained beef or heart is best) to one raw egg beaten together. This mixture has two great advantages.

First, while it is fluid enough to pass through a very small tube when freshly mixed, it is almost wholly digestible and the solid fecal residue, even in animals that have not fed for a long time, is very small. Secondly, and more important, most animals thus fed start feeding on their own within a short time. Our most impressive success was with a baby alligator snapping turtle brought in by a friend two years ago. The specimen, which had not fed since purchased, was so emaciated that I feared that the physical shock of feeding alone might kill it. However, a small amount of beef-egg mix was run into its stomach through a small rubber catheter forced over a 13-gauge needle on a hypodermic syringe and I instructed our friend to return with the turtle', if it were still alive, for a second feeding in three days. However, before the time had elapsed the turtle began to take fish of its oven accord, and is still alive and growing at the time of writing.

For snakes (and it is no secret that many aquarists, including myself, are Ophidiophiles on the side) we have worked out a method which effectively prevents regurgitation following a large liquid meal. This is to immediately place the snake in a large glass jar with a perforated lid and containing several inches of water. This both supports the weight of the distended stomach and causes the-snake to keep his head and neck extended as he attempts to escape through the top. After a minute or so of this activity, the snake will usually become quiet and can then be returned to his cage.

We have continued to use our method with success on a number of animals including a young African python, various boas, an African desert monitor, tokay gecko, a barking frog, Ceratophrys (whose bite was worse than its bark, which we never heard), and two Surinam toads. In nearly every case only one or two Iiq6id meals were necessary before normal feeding began.

For the smaller specimens the use of a small rubber catheter tube forced over a needle has been described, and for larger ones we use a regular male catheter and a solid rubber bulb syringe, which may be obtained at most drugstores. The clear plastic cake-basting guns now sold at supermarkets should work admirably for this purpose as well. Since most rubber catheters have a flanged proximal end they retain themselves well by friction to any rubber, glass, metal, or plastic nipple of a suitable plunger-type apparatus. Use of the feeding catheter is facilitated by the use of surgical jelly, or other appropriate lubricant. Although the feeding mixture described above appears adequate by itself, any additives such as vitamin drops, etc. are left to the discretion of the user.

In artificial feeding, one should never underestimate the injectee's retaliatory powers, as I recently learned while feeding a 35-inch Megalobatrachus japonicus at the National Aquarium. Following a successful feeding, the salamander suddenly grabbed my left thumb at the first joint and twisted, necessitating no less than fifteen stitches to close the wound, and the outer surface of my thumb is still devoid of feeling. The salamander, which had fasted from August to January, began to take food of its own accord after this one feeding.

Craig Phillips, National Aquarium, Washington, D. C.

A VISIT TO THE PHILADELPHIA ZOO AND AQUARAMA “THEATRE OF THE SEA” 18 DECEMBER 1962

On the 18th of December, this writer had the opportunity to visit both the 'Philadelphia Zoological Gardens, and a totally new zoological exhibit in Philadelphia, called Aquarama "Theatre of the Sea." This informal report to my many correspondents gives forth data on new arrivals, .and changes at the zoo, as well as data on specific groups of animals, and my candid

views of Aquarama. Certainly with the opening of a new Aquarium Philadelphia offers to its citizens, and to the many tourists who visit the "Cradle of American Liberty," some of the largest and finest scientific and artistic institutions in the United States. There is the famous Academy of Natural Sciences, with the finest Natural History library in America, and many natural habitat groups: the Franklin Institute, with Fels Planetarium; Philadelphia Museum of Art; several smaller yet imposing art galleries; a large ethnological museum at the University of Pennsylvania, and the Philadelphia Orchestra.

Aquarama obviously has been opened in a hurry. for many of the tanks are not completed, and several remain in a process of being filled to capacity. Nevertheless it is imposing, and appears good. It is located at 3300 South Broad Street, only 10 minutes drive from the centre of the city, is easy to reach either by car or public transportation, and offers unlimited parking facilities. The area in which it is located has only in recent years been developed for industry and as a residential area. Within a few blocks is the large 100,000 seat Philadelphia Stadium, the Philadelphia Naval Base, and the Delaware River is less than a mile distant, which will allow for easy access to the oceans and shipping. While I was unable to determine if the Aquarium is using natural or manmade salt water, I would assume from the clarity of the water that it is natural sea water. Admission is $2.00 for adults, and $1.00 for children under 19. Groups can secure rates of about 50% less. Since no funds are provided by the City of Philadelphia, again I am unable to say whether or not school children are further subsidized. I had a very limited amount of time to see this new place, hence I did not try and meet any of the-staff.

Like all of the newer Aquaria in America, a large portion of the building has been devoted to a theatre for the exhibition of Porpoises, in fact I would say between 1/2 and 2/3 of the building is taken up by this theatre and a 150,000 gallon tank. After viewing the Seven Seas Panorama at the Chicago Zoological Park, the only other porpoise exhibit located away from the ocean, I must say that Aquarama's is a much better exhibit. For one thing, the spectators are arranged in some 13 rows of benches, which start on a level about three feet above the bottom of the porpoise tank, and end at a point many feet above the surface of-the water. The entire tank, which I would say is no less than 72 feet in length, is enclosed by, on the viewing sides, large panes of glass, which seem about 6 feet square, joined by green-painted metal joints. Thus one can readily see the mammals as they maneuver below the water, or above. Both as a preventative against foreign objects being thrown into the tank, and as a safety measure, large sheets of clear plastic, with a slight overhang,.,, project for about five feet above the top of the glass pane; or water level. At the start and end of the porpoise show, streams of water are played against these plastic sheets with a taped commentary and exciting music and colored lights also being played. The overall effect is very commercial, yet not displeasing. The show using three of the common Bottle-nosed Porpoise (Tursiops truncatus) has not been completely perfected, and requires much polishing. However to anyone, and especially impressionable school children, who have never seen a live porpoise show, it is good, and the reaction yesterday by several hundred school children from local elementary and junior high's was vociferous. Used with the porpoises are a clown and a very attractive young girl in a very well-filled black one-piece swim suit. In this letter connection I may add that there appeared both on view and behind the scenes many attractive members of the opposite sex.

The Aquarium building proper contains a large 155,000 gallon tank, that presently contains fresh-water, and holds a wide variety of native American fresh-water fish, and a large marine turtle. In the center of this tank, which is about two stories high, is a large rock formation, and planting is used extensively. Lighting however is dark, and the water not as clear as in the salt water tanks. However it was sufficient to see all the fish, and again a very attractive young lady who disports in the tank, every few hours with aqua-lung and flippers, much as a skin diver. She follows the commentary of an outdoor speaker and points to several fish, executes a few underwater maneuvers, and rides along with the turtle. 'I might add the blonde used yesterday was a very good and buxom specimen of Homo sapiens. I am sure that many of the gentlemen peering in the glass found her antics most amusing. Again here as in the porpoise tank, the panes of glass surrounding the tank are very large, and offer a much greater viewing space than many Aquariums. Two ramps surround this tank, so that one may view either from ground level, or a point about eight to ten feet above that. Unfortunately these ramps were not designed to deal with a large crowd, since one has to push back those coming up one ramp to get back down. However, this can easily be solved. The floor area behind this tank is planted with tropical and semi-tropical vegetation. In this section of the building (while there is no really large subdivision, it appears to be in three sections) and across a very wide lobby is a snack bar area, and a souvenir and candy-pop-corn area, each enclosed from the main lobby. Doors also offer access to the outdoor areas. These glass doors are double to prevent the escape of both heat, and in the summer cool air, as the entire structure is air-conditioned, which alone should be a boon in the summer months. A series of coat hangers are also provided in this area, a most sensible idea. The second or middle section contains several small tanks in a zigzag arrangement along one wall, which are used for other fresh-water displays, and the usual colorful reef fish. Many are most handsome. Along a third side wall are some small tanks for tropicals utilizing "blue" light, which produces some wonderful effect, especially on Neon Tetras. Two separate groups of tanks are used for salt water fish, one section being incomplete at this time. A good-sized tank, which has glass walls for three of five sides, contains 2 large Spotted Jewfish, 2 Sand and 2 Nurse Sharks. One of the latter is a very immense specimen. An unfinished tank in the center of the room is planned for Octopi. A series of wall tanks also are made to look like a brook, with water only to a half-level, and containing some very fine Surinam Toads, Matamata, Soft-shelled Turtle, Alligator and Caimans and other reptiles. Naturally each is separated from the other. The floor in both this and the preceding section is terrazzo; in the theatre of the sea, concrete. The colors of cream-yellow and green predominate, and the building is finished in green and white brick, and modernistic shaped concrete. Two large outdoor pools are also included in the Aquarama grounds. One is divided into two parts, one for Humboldt Penguins and one for California Sea Lions. There is a large lawn surrounding the entrance, which will in time become a most attractive lawn. As a landmark, a diving porpoise has been placed several feet above the ground on a pole. Total cost has been over $3,500,000 provided by a private corporation, headed by a member of the local park commission. The Director is Frank Powell, Jr.; Curator, Winfield Brady; Aquarist, Stanley Trostel; Chief Engineer, Joseph McWilliams; Porpoise Show Trainer, Dell Winders, and as mentioned a bevy of beautiful assistants.

I recommend this exhibit to all who visit Philadelphia, although it will take several weeks to complete all the exhibits, and bring the porpoise show to a good level. --- Sfc Marvin L. Jones, Ft Meyer, Va.

This contribution concluded with a description of the Philadelphia Zoo -- which I deleted, --- Ed.

MISSION BAY OCEANARIUM

The final push of preparing final plans and the myriad of details that go into putting a new oceanarium together are underway at San Diego. Construction on the earliest phases is expected to start in late March or early April of this year. The park, which is part of the extensive Mission Bay recreation area, will include a number of innovations new to the aquarium world. There will be a large dredged lagoon where surface shows will be staged, a Reef Tank building where a diver will be the guide, an underwater porpoise theatre and an extensive formal Japanese garden in which the visitor will enter into a scene far removed from the-normal California atmosphere, and where shows will be staged in a viewing tank, showing the techniques of pearl culture. This portion of the exhibit is sponsored by a Japanese Pearl firm, and much of it is being especially constructed in Japan. --- Ken Norris

SEA LIFE HAWAII

The first stage of construction has been completed at the majestic site at Kaupo Park on the island of Oahu. It is a mammal training facility that will service both the display park and its associated nonprofit research center. The entire park, which is located on a 118 acre site, faces the sea with abrupt 1000 foot lava cliffs on one side and coral pocket beaches on the other. The entire project is unique amongst existing oceanaria in that it is a non-profit venture dedicated to the advancement of knowledge of the sea. The parent organization, the Oceanics Foundation, will oversee both the exhibit park and the adjacent Pacific Oceanics Institute. The latter organization will utilize the unparalleled water supply which will be pumped at nearly 5 times the rate of any existing facility. It will include both surface and deep sea experimental facilities, and associated structures for the-use of industry and academic institutions. Already, Taylor Pryor, President of the Foundation, has unique exhibit animals in training. They are spinner porpoises, and of the four thus far taken, one is a partial albino named Haoli (which means "white man" in Hawaiian), --- Ken Norris

The “Coortons” intended for page 20 are missing from the copy used for the archiving process in 2001. PJM