NPS Form 10-900
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United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received 3/4/86
date entered APR 14 1986

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic Marine Studios

and/or common Marineland

2. Location

street & number Route 1, Box 122 N/A not for publication

city, town Marineland X vicinity of

state Florida code 012 county Flagler code 035

3. Classification

Category	Ownership	Status	Present Use	
___ district	___ public	X occupied	___ agriculture	___ museum
X building(s)	X private	___ unoccupied	X commercial	___ park
X structure	___ both	___ work in progress	X educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	X entertainment	___ religious
___ object	___ in process	___ yes: restricted	___ government	X scientific
	___ being considered	X yes: unrestricted	___ industrial	___ transportation
	N/A	___ no	___ military	___ other:

4. Owner of Property

name Marineland, Inc.

street & number Route 1, Box 122

city, town Marineland N/A vicinity of state Florida

5. Location of Legal Description

courthouse, registry of deeds, etc. Flagler County Courthouse

street & number

city, town Bunnell state Florida

6. Representation in Existing Surveys

title N/A has this property been determined eligible? ___ yes X no

date N/A ___ federal ___ state ___ county ___ local

depository for survey records N/A

city, town N/A state N/A

7. Description

Condition		Check one	Check one
_X_ excellent	___ deteriorated	___ unaltered	_X_ original site
___ good	___ ruins	_X_ altered	___ moved date _____
___ fair	___ unexposed		

Describe the present and original (if known) physical appearance

Marineland, originally called Marine Studios, is located on a narrow strip of land between the Atlantic Ocean and the Intercoastal Highway in the incorporated municipality of Marineland, which straddles the St. Johns County-Flagler County line. It is on Highway A1A, 18 miles south of St. Augustine and 35 miles north of Daytona Beach, Florida. For purposes of National Register nomination, the extent of significant features of the property is limited to the northeast portion of the municipality, including the landscaping and main entrance to the oceanarium, the oceanarium and auxiliary buildings, and the porpoise stadium (see attached map).

Constructed during 1937 and early 1938, Marineland was the world's first oceanarium and underwater motion picture studio. Since its completion, it has also served as one of the leading tourist attractions in Florida. The centerpiece and most important component of the Marineland complex is the oceanarium, consisting of two tanks located in the northeast section of the municipality. Although they have received alteration and additions since their original construction, the tanks retain the integrity of the original design and most of their individual features. Furthermore, the additions are compatible with the original components and in some instances have assumed significance of their own.

The design of the tanks was a classic example of form following function. Fred Waller, motion picture consultant and president of Courier Productions, first worked out camera angles necessary to do filming in the tanks. These specifications were passed on to M. F. Hasbrouck, en engineer and swimming pool designer. Hasbrouck's original plan of a reinforced concrete structure, partially below ground, would not permit full observation of the fish, especially from the bottom, and the requisite thickness of the walls would prohibit certain camera angles. As a result of those flaws a new design was developed, calling for suspended steel tanks weighing much less and having considerably thinner walls.[1]

Construction began May 15, 1937 (photo no. 6). Concrete foundations were poured in place. Atop them rested a framework of steel beams, infilled with brick, hollow clay tile, and cement. The outside walls were finished in stucco. The foundation and framework supported two tanks: a circular one to the south, 75 feet in diameter and 11 feet deep (photo no. 7); and a rectangular one to the north, 100 feet long, 40 feet wide, and 18 feet deep (photo no. 7). Between them was, and remains, a rectangular flume into which marine specimens could be lifted by hoist, then transferred to one of the two tanks through metal gates.[2]

The other walls of the tanks were made of steel plate, with 200 portholes of Tu-flex glass (chosen for strength and visibility) held in place by metal frames that were electrically welded to the steel plates so as to become an integral part of the structure. The interior of the tank was lined with mesh, for reinforcement, then coverd with gunite, a mixture

8. Significance

Period	Areas of Significance—Check and justify below			
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion
___ 1400–1499	___ archeology-historic	___ conservation	___ law	_X_ science
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture
___ 1600–1699	_X_ architecture	___ education	___ military	___ social/ humanitarian
___ 1700–1799	___ art	___ engineering	___ music	_X_ theater
___ 1800–1899	___ commerce	___ exploration/settlement	___ philosophy	___ transportation
_X_ 1900–	___ communications	___ industry	___ politics/government	_X_ other (specify) tourism
		___ invention		

Specific dates 1937 **Builder/Architect** See Continuation Sheet, page 11

Statement of Significance (in one paragraph)

Marineland of Florida fulfills criteria A and C for inclusion in the National Register of Historic Places. Although less than fifty years old, the site's listing is warranted by its association with individuals who have played prominent roles in scientific research, marine education, tourism, and film-making, its primacy in the development of Florida's modern tourist industry, and its exceptional contributions to science and education. Finally, Marineland is significant as an original type of structure--an oceanarium--which served as the model for similar structures subsequently constructed throughout the world. To a lesser degree, it is important as representative of Nautical Moderne design and for its landscape architecture.

9. Major Bibliographical References

Published Works

Breeder, C. M. "Observations at Marine Studios." Bulletin of the New York Zological Society (July, 1938), 123-129.
(see continuation sheet)

10. Geographical Data

Acreage of nominated property 6

Quadrangle name Matanzas Inlet **Quadrangle scale** 1:24,000

UTM References

	Zone	Easting	Northing
A	17	479660	3281950
B			
C			
D			
E			
F			
G			
H			

Verbal boundary description and justification

The significant historic features of Marineland of Florida are contained within the following general boundaries: on the east by the Atlantic Ocean; (see continuation sheet)

List all states and counties for properties overlapping state or county boundaries

state	N/A	**code**	N/A	**county**	N/A	**code**	N/A
state	N/A	**code**	N/A	**county**	N/A	**code**	N/A

11. Form Prepared By

name/title Historic Property Associates/Diana Primelles, Historic Sites Specialist

organization Florida Division of Archives, History and Records Management **date** January 8, 1986

street & number The Capitol **telephone** (904) 487-2333

city or town Tallahassee **state** Florida

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

X national X state X local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature Clara N. Penny

title State Historic Preservation Officer **date** March 25, 1986

For NPS use only

I hereby certify that this property is included in the National Register

Amy Slaton **date** 4/14/86

Keeper of the National Register

Attest: **date**

Chief of Registration

PRESENT AND ORIGINAL PHYSICAL APPEARANCE (continued)

of sand and cement applied at high pressure. It was finished with a rubber paint newly devised in Germany with outstanding water and acid-proof qualities.[3]

The architects built upon the specifications produced by the motion picture consultant and engineer. John Walter Wood of New York drew the preliminary sketches and Fred A. Henderich of St. Augustine made the final renderings. Adapting their design to the shapes and materials chosen by their predecessors, they created graceful structures that reflect the influence of the Nautical Moderne style, which was popular at the time. Features associated with the Nautical Moderne found at Marineland include rounded corners and steps, ribbons or bands of portholes, steel railings, curved canopies, string courses along the coping of walls, smooth stucco wall finishes painted white, decks, and curved ventilation stacks like those found on ships (photo no.2). At the time of their construction the tanks were purposely left uncovered to provide the realistic effect of natural lighting for filming.[4]

Since their construction, the tanks have been scrupulously maintained. Despite the corrosive effects of salt water and air and the changing function of the oceanarium, their original plan, overall design, and the majority of the features and materials remain intact. The tanks have been altered on several occasions, when essential repairs were required or modifications deemed necessary to enhance the safety or comfort of visitors. The main alteration to the tanks occurred in 1953 when Marineland was shifting its principal orientation from an underwater motion picture studio to that of a fully mature tourist attraction. The tanks were repaired, additional portholes added, and the steel railings along the stairs and upper decks encased in brass. In 1956, a covered entranceway was constructed at the southern approach to the circular tank, and about that time some original portholes were plugged near the main entrance to prevent congestion at openings to the observation points around the tank. Also plugged were the portholes of the underwater movie studio after it ceased to function. The main addition to the tanks occurred in 1966 when an arched steel framework supporting a canopy was constructed. This feature was designed to provide a shaded area for spectators viewing performances in the tanks from the surrounding decks.[5]

Despite those alterations, the tanks retain their integrity to a surprising degree, given their exposure to salt water corrosion, the extreme water pressure, and continuous use for nearly fifty years. The steel reinforced concrete foundations, supporting steel framing, and the tanks themselves remain completely intact. Original features such as the stairways and the solid cypress doors also remain. Remarkably, much of the original mechanical system continues to function, particularly the supply

PRESENT AND ORIGINAL PHYSICAL APPEARANCE (continued)

and drain lines to the tanks. The lines are cast iron with a cement lining, a feature which has helped to preserve them by insulating the metal from the corrosive effect of salt water.[6]

The auxiliary structures and buildings associated with the original oceanarium complex have also remained largely unchanged since their construction in 1937. The rectangular flume connecting the two tanks is original with the exception of a corridor beneath it, which was widened in 1953 when separate ticket and announcer booths were added. Due east of the flume is the original marine research laboratory. The interior space of the laboratory, the boiler, the windows, and the windows' fenestration pattern are unchanged. Within the lab and in other sections of the oceanarium the scarring from the 1 x 6 form boards used to construct the walls and ceiling is still visbible (photo no. 9). Also still visible on the eastern exterior wall of the laboratory is the original lettering describing the building as the "Marine Studios Biological Station" (photo no. 2). Proceeding east from the lab is the original filter plant. Again, with the exception of new pumps that were added in 1972, the building housing the plant and the mechanical systems within it are all original. The final extant component from the original complex is the gift shop. The round steps and corners and the curved canopy are features of the gift shop associated with the Moderne influence. As Marineland prospered, the shop was expanded by major additions, constructed in 1956 and 1967.[7]

Another integral part of the Marineland complex is the porpoise stadium (photo no. 5). The stadium consists of a main pool surrounded on three sides by smaller feeder pools. On the south side of the pool is a grandstand where spectators view the performance by various marine mammals. Although not a part of the original complex, the stadium is nevertheless noteworthy of inclusion within the boundaries of the study because of its significance as the site of the first public performances by trained dolphins. It was constructed in 1953-1954. The bleachers and an arch with a Marineland sign were added in 1955.[8]

A final noteworthy feature of the Marineland complex is the landscaping (photo no. 9). As originally conceived by landscape architect Mulford B. Foster, the landscape design took full advantage of the natural forms and plant life found along the northeast Florida coast. One particularly creative aspect of the design is the conservation and incorporation of oyster shell middens into the landscaping (photo no. 13). Remnants of the middens are found at the north entrance to Marineland and at the main entrance to the oceanarium complex. Foster, who was associated with the Tropical Arts Nursery and Studio of Landscape Design in Orlando, blended many native plants with exotics imported from other parts of the world. He used cactus, yucca, agave (century plant), cabbage and sabal

PRESENT AND ORIGINAL PHYSICAL APPEARANCE (continued)

palms, and sawtooth or scrub palmettoes. Ground cover consisted of the sea daisy, brown eyed susan, beach verbana, and beach morning glory, together with St. Augustine and Bermuda grass;. Most of the features and many of the plants from Foster's design remain. The walkways retain their original pattern and most of the borderstone are original. Some of the landscaping was removed, however, as the complex expanded to the north and south. Also, the original quarried coquina steps leading to the top of a midden to the south of the gift shop were replaced for safety reasons with steps constructed of reinforced concrete.[9]

In 1986, the original Marineland oceanarium remains one of the leaading tourist attractions in Florida. Since 1938 some expansion and alteration of the facilities have been necessary. Benches have been provided for the comfort of spectators, and the complex is surrounded with a porpoise pattern cast concrete wall. The additions, with their curving lines, are generally harmonious with the original Moderne design. Although the style is no longer in vogue, as it was at the time Marine Studios was constructed, it is becoming venerable in its historic appeal.

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[1] St. Augustine Record, June 23, 1938.

[2] Ibid.; Ralph Nading Hill, Window in the Sea (New York, 1956), 42-44.

[3] St. Augustine Record, June 23, 1938.

[4] Ibid.; Michael F. Zimny, "Robert Vincent Derrah and the Nautical Moderne" (M. A. Thesis, University of Virginia, 1982), 7, 9-10, 16.

[5] Interview with Wally Rake, maintenance supervisor at Marineland, August 20, 1984, Marineland, Florida. Rake, a lifelong resident of St. Johns County, has worked at Marineland since its inception.

[6] Ibid.

[7] Ibid.

[8] St. Augustine Record, February 27, 1955; Eau Gallie (Florida) News, December 23, 1954.

[9] St. Augustine Record, October 29, 1937.

STATEMENT OF SIGNIFICANCE (continued)

Marineland opened in 1938 as the world's first underwater motion picture studio. A new word, "oceanarium," was coined to describe it--denoting a place where various species of marine life lived together, as they do in the sea, rather than kept segregated, as they had traditionally been in aquaria. The founding group of "Marine Studios"--the original name given the facility-- included men who shared an interest in film making and exploring and who had ties to some of the great American fortunes. W. Douglas Burden, a great-great-grandson of Commodore Cornelius Vanderbilt, was a trustee of the American Museum of Natural History, author of The Dragon Lizards of Komodo, and producer of a film on Indian life, The Silent Enemy. His cousin, Cornelius Vanderbilt Whitney, also a museum trustee, was chairman of Pan American Airways and involved in making the motion picture classic Gone With the Wind. Sherman Pratt, whose grandfather was one of the partners of John D. Rockefeller in Standard Oil, was connected with RKO pictures and an active member of the Explorers Club. Count Ilia Tolstoy, grandson of the Russian novelist, Leo Tolstoy, shared with his cofounders an interest in natural history and film-making.[1]

These men were intrigued by the success of their friend Merian Cooper (best known for the movie King Kong) in obtaining scenes of wild animals for his movie Chang. Cooper had built a filming corral in the jungle sturdy enough to hold animals and spacious enough so as not to be visible on film, and with it pioneered a new level of realism in motion pictures. Burden and Vanderbilt believed something similar could be done with underwater filming and after seeking an appropriate location chose a remote spot on the Northeastern Florida coast between St. Augustine and Daytona Beach. The site was recommended by its relative freedom from the destructiveness of hurricanes, the clarity of the coastal water, and its location near Matanzas Inlet and the Intracoastal Waterway, which would permit deep-sea specimens to be rapidly transported to the proposed facility's aquariums.[2]

Burden prepared for the founders a prospectus summarizing the technical and economic difficulties they would encounter. Up to that time, scientists had had little success in keeping large marine specimens alive for any length of time in a controlled aquatic environment because of problems in maintaining proper water salinity, transporting specimens, and providing the specimens acceptable food. Designing tanks that promised to resolve such problems while accomodating the needs of film-makers presented an engineering challenge. An aquarium of the size the founders proposed had never before been constructed, nor had any attempt ever been made to develop a facility enabling a constant and direct exchange of water from the sea. Burden also warned of hazardous economic consequences, since the demand for underwater films would probably not support the cost of the enterprise. He proposed, therefore, the simultaneous development of Marine Studios as a tourist attraction. Much of Burden's prospectus was devoted

STATEMENT OF SIGNIFICANCE (continued)

to an analysis of the commercial potential tourism offered.[3]

The tourism industry in Florida, of such proportions today that the state itself ranks as the second largest destination in the world, traces its beginnings to the 1820s, shortly after the United States acquired the peninsula from Spain. Visitors were first attracted to St. Augustine and they came for various reasons: consumptives seeking relief in an allegedly healthful climate; seasonal residents taking refuge from cold northern winters; and genuine tourists fascinated by the strangeness of Spain's cultural imprint. Development of the tourist trade did not come swiftly, however. Major conflicts, the Seminole wars and the Civil War, discouraged visitors, as did Florida's great distance from the nation's populous regions. In the late nineteenth century entrepreneur Henry Morrison Flagler, a former partner of John D. Rockefeller in the Standard Oil Company, began construction of a rail line along the state's east coast, inching southward year by year, spurring development of great hotels and resort cities along the way. St. Augustine, which for a time flourished as the "Winter Newport," a resort to which the rich, the famous, and the curious repaired on a Florida vacation, was soon supplanted by cities farther south offering even warmer temperatures.[4]

By 1930 a paved, two-lane highway, running parallel to the railway along the coast, had been completed down the entire length of the state, permitting access to automobile-borne visitors and inducing changes in the nature of Florida tourism. Federal laws governing hours in the workplace, generally designed in the 1930s to create greater distribution of jobs, resulted in more vacation time for workers in northern industries, who began in increasing numbers to look toward an annual trip to Florida. The seasonal nature of Florida tourism virtually turned over in the decade. Once a winter residence for the wealthy, the state began drawing more middle-class visitors and they arrived in the summertime packed in automobiles. To accomodate them, modest motels replaced ornate hotels and tourist attractions calculated to please the visitor-on-the-run sprang up. The New York Times reported in 1938 that for the first time in fifty years there was a concerted effort on the part of the state to keep visitors beyond "the orthodox season limit," and that three million tourists were expected that year.[5]

Burden reviewed those trends and conducted additional marketing studies of his own. He obtained admission figures from the principal tourist attractions in neighboring St. Augustine and counted the automobiles entering the state on U. S. 1 to determine the potential number of people who might travel the highway, which ran beside Marine Studios. From such studies he developed an estimate of the number of visitors Marine Studios might expect to attract and concluded that by combining tourism with film-making the facility could yield a favorable return for the

STATEMENT OF SIGNIFICANCE (continued)

investors. Events quickly proved him correct. Burden had optimistically projected annual attendance of 210,000. The formal opening on June 23, 1938 drew over 20,000 people and within two years the facility was attracting nearly a half million visitors annually. It at once became the state's premier tourist attraction, that is, a commercial facility designed expressly to appeal to visitors. Although the advent of war soon forced Marine Studios to close temporarily, by 1951 it had regained its place as the state's top commercial attraction. Eventually, Marineland, as the facility was renamed in the 1940s, was supplanted in popularity within the state by other attractions, resulting largely from changing travel patterns, but the significance of its contribution to the development of tourism in Florida, the state's largest industry and one that presently attracts 36 million visitors annually, remains.[6]

Serious promotion of Marine Studios prompted stories and reports in leading national newspapers and magazines, including the Saturday Evening Post, Women's Home Companion, Life, Time, Vogue, The New York Times, and numerous others. One of its early publicity men was Ivy Lee Jr., whose father was one of the founders of the modern public relations profession. The senior Lee's greatest triumph was in changing the popular image of his client, John D. Rockefeller, from Robber Baron to philanthropist. Two notable early visitors to Marine Studios were First Lady Eleanor Roosevelt, who wrote about it in her syndicated newspaper column, "My Day," and correspondent Ernie Pyle, who proclaimed it "something absolutely new in Florida." In succeeding years Marineland became a watering hole of sorts for literary figures such as Ernest Hemingway, Alexander Woolcott, John Dos Passos, Thornton Wilder and exiled Norwegian Nobel Prize winner Sigrid Undset. Brothers William Rose and Stephen Vincent Benet, descendants of a prominent St. Augustine Minorcan family, visited as well. William Rose Benet was inspired by Marineland to write a children's book about dolphins, and also mentioned Marineland in his autobiographical The Dust Which Is God, which won the Pulitzer Prize for poetry. Humorist Robert Benchley, (whose grandson, Peter Benchley, would later write the best-selling novel Jaws) came so often that he was proclaimed honarary mayor of Marineland. Its literary connections continued after World War II when operation of the Dolphin Restaurant at Marineland was taken over by Norton Baskin, husband of Pulitzer Prize winning novelist Marjorie Kinnan Rawlings.[7]

The groundbreaking for the project took place on May 15, 1937 and the work was completed in just a year, a remarkable feat given the engineering problems associated with the design and construction of tanks scaled to a size never before attempted. The weight of water in one tank filled to capacity was calculated at 3,271 tons, requiring prohibitively thick walls of concrete, which would have interfered with the viewing angles needed for film-making. Welded steel plates lined with steel mesh reinforcement,

STATEMENT OF SIGNIFICANCE (continued)

sprayed with "gunite," a mixture of sand and water applied at high pressure, and finished with a newly devised rubber paint, provided the necessary strength for the walls while permitting their thickness to be reduced. Investigations revealed that sea water could not be synthetically duplicated. Accordingly, it had to be pumped in from the sea and constantly changed to maintain its purity and clarity. Five million gallons of water had to be exchanged every four hours, requiring a specially designed intake and filtration system. A perforated vitrified clay pipe was set offshore 150 feet and covered with a coarse gravel that prohibited the infiltration of sand. A specially prepared glass, called "Tu-flex," with a safety coefficient of 1,800 pounds per square inch, was used for the viewing ports along the sides of the tanks.[8]

The engineering work for the tanks was performed under the direction of M. F. Hasbrouck, who had designed the swimming pool at the White House, as well as the one at the Roosevelt home in Hyde Park, New York. Engineering professors from the universities of Florida and Alabama contributed to the design of the filtration and pumping systems. Preliminary sketches for the design of the various structures at Marine Studios were drawn by John Walter Wood of New York and the final renderings produced by St. Augustine architect Fred A. Henderich, a graduate of the Columbia University School of Architecture, who in 1905 had settled in the Ancient City, where he pioneered in restoration architecture. Henderich often experimented with Spanish themes in his work and in 1914, following a disastrous fire in the city's downtown area, was called on to design many of the replacement buildings. He created a virtual renaissance in the city. At the height of the Florida boom in 1925, Henderich was elected president of the state architectural association. No other architect has left so visible an imprint on the St. Augustine. Marine studios was Henderich's last major endeavor, since he died of a heart attack in 1941.[9]

The design for the various structures at Marine Studios exhibited a blend of form and function, for the Nautical Moderne styling is appropriate to the site's location and purpose. Moderne, or Modernistic, popularized in the United States as Art Deco, took its name from the 1925 Paris Exposition as a showcase for works exhibiting a new style of ornamentation and decoration applied to traditional forms. During the 1930s a "streamline" version of the Moderne evolved in which nautical forms were applied to structures to emphasize their association with the sea. The Nautical Moderne features found at Marineland include rounded steps and corners, ribbons or bands of portholes, steel railings, curved canopies, stringcourses along the coping of walls, smooth stucco wall finishes painted white, decks, and curved ventilation stacks. The rounded rather than angular lines of the style permitted the design of the tanks and structures to accomodate the needs of film-makers, while features such as the portholes found a useful application, allowing visitors and cameramen

STATEMENT OF SIGNIFICANCE (continued)

to peer into the depths of the water. Marineland provides a rare northeast Florida example of the Moderne movement. Complementing the appearance of the facility was its landscape architecture, significant for its use of natural forms and plant life common to the northeast Florida coast. It was the work of Mulford B. Foster, a pioneer in his profession in Florida, who was associated with the Tropical Arts Nursery and Studio in Orlando.[10]

From the beginning, scientific research was an important part of Marine Studios, by design and necessity. Since large numbers of marine life had never before been maintained in a simulated natural environment under controlled conditions, the scientists working at the facility had often to engage in pioneering studies of marine biology. It was not known, for example, whether various species of fish would cohabit and especially doubted that sharks and porpoises could be placed in the same tank. The food requirements of large marine animals had never been previously determined. When the oceanarium was first opened, it was found that the simple exchange of sea water was not sufficient to maintain purity and clarity in the tanks, which quickly clouded with algae, causing many specimens to die from parasites. Indeed, the control of skin diseases in fish was at the time a study barely in its infancy. The ability to observe marine animals closely in a controlled environment over a long period of time led eventually to numerous discoveries and findings that have become incorporated into the textual literature of marine biology and related disciplines.[11]

The radical departure from standard studies of marine life and behavior which Marine Studios afforded was emphasized in the July, 1938 issue of the Bulletin of the New York Zoological Society, whose director, noted biologist C. M. Breeder, hailed the opportunity to make "valuable scientific studies to which neither straight field work nor laboratory work lends itself in any appropriate manner." Within six months of the opening of Marine studios, scientists learned from their observation of marine life in the tanks that fish have an elaborate social organization and that there are rules of social conduct right up through the vertebrate series. Breeder was especially intrigued by the captive porpoises, whose methods of locomotion had never previously been observed and whose apparent efforts or ability to communicate had been suspected but never verified. Studies of all aspects of porpoise life was begun at Marineland, including mating, birth, movement, communication, and training of the animals. The porpoises' use of sonar, or "echo location," was discovered there, and in the 1950s Dr. John Lilly of the National Institute of Health undertook at Marineland a study of the marine animals' social relationships that led to a popularization of such work. A mere handful of people participated in the field of cetaceous mammology in the early 1960s; the 1983 Fifth Annual Conference of marine mammologists attracted more than 1,000 scientists.[12]

STATEMENT OF SIGNIFICANCE (continued)

Preserving the marine life held captive in the tanks presented the most immediate challenge to the scientists at Marine Studios, for it was soon found that the constant exchange of sea water, so technically difficult to accomplish, was not alone enough to prevent the growth of algae in the tanks and the subsequent introduction of skin and other diseases in the fish and marine animals. Treating sea water for fish, it was found, was more delicate than treating it for humans. Marineland curator Arthur McBride discovered after years of research that a copper compound added in minute traces to the water would control the algae and eliminate parasites without killing the fish. The formula, carefully protected by Marineland for some years, was eventually released to other aquariums facing similar problems and proved a landmark in water treatment research.[13]

While scientific research by Marineland curators and cooperating scientists was a part of the facility's operation from its inception, the idea of constructing a scientific laboratory on the grounds was initially suggested in 1941 to Cornelius Vanderbilt Whitney by Chicago University President Robert Hutchins. World War II, during which Marineland was forced to close, interrupted activities, but Burden resurrected the suggestion in 1951 and proposed establishing a foundation to sponsor scientific studies. A cooperative research program enlisting the participation of visiting scientists was initiated and formally institutionalized in 1974 with the establishment at Marineland of the University of Florida's Cornelius Vanderbilt Whitney Laboratory for Marine Biology and Medicine. The laboratory has eight staff members with faculty appointments at the University, six associates, six fellows, and technical assistants - - many of them working on grants from the National Institute of Health. Some of the research carried on there has had applications to the study of birth defects and cancer.[14]

Although America's entry into World War II in December, 1941, followed by gas and tire rationing that cut into tourist travel, coastal blackouts, and calls to national service for many Marineland personnel (Ilia Tolstoy, for instance, became President Roosevelt's personal representative to the Dalai Lama in Tibet), resulted in the oceanarium's public closing, some activities continued. In the summer of 1942 the tanks were emptied, the specimens given away or released into the ocean, and the facilities turned over to the Coast Guard for use in training combat dogs. One wartime contribution came in the form of research that Marineland conducted under contract with the government on a shark repellent that was adopted by the U. S. Army and Navy in sea survival kits for downed personnel. After the war, extensive work was required to get the facilities back in shape. About $250,000 was expended and the first tank reopened to the public on March 1, 1946. By the end of May, Marineland was back in full operation.[15]

STATEMENT OF SIGNIFICANCE (continued)

Tourism remained the mainstay of the operation in the postwar years and by 1951 Marineland had become the state's leading commercial tourist attraction. Annual receipts exceeded one million dollars for the first time. Showmanship was added to the display of marine life, a result of the research conducted on porpoises, whose training at Marineland in the postwar years enabled the owners to develop performing marine animals. Begun in 1949, successful enough by 1951 to be shown to the public and by 1954 to merit a new stadium for display purposes, the venture achieved considerable popularity and in subsequent years was widely copied by similar facilities throughout the world. Marineland's first trained porpoise, Flippy, was featured in movies and other media, and his death in 1955 at the age of eight gained front-page attention throughout the country.[16]

The marine film business was also resumed. The Marineland vaults contain an extensive library of documentaries, shorts, and other moview that were made there over the years. Guests who had film ties included pioneer director D. E. Griffith, Lowell Thomas, Robert Ripley, Monty Wooley, Vincent Price, and Gypsy Rose Lee. Gary Cooper visited Marineland while filming Distant Drums in St. Augustine in 1951 and Marineland generated some publicity when it offered the producer, Warner Brothers, "the opportunity to hold the first underwater motion picture premiere in history in our crystal-clear waters." One of the staples of the horror-film vogue of the 1950s, Creature from the Black Lagoon, was shot at Marineland, and was sufficiently successful to spawn a sequel, Revenge of the Creature, with John Agar and Lori Nelson, in 1955. A review in the New York Times panned Revenge as a "waterlogged exercise," but noted that Marineland, "the most unusual aquarium in the world, makes a nice picturesque background indeed."[17]

The rise of television produced new avenues for publicizing the attraction. Scenes of the porpoises appeared on the Arthur Godfrey show, and NBC prepared a special called "Marineland Circus" starring Buster Crabbe, Lloyd Bridges, and Rosemary Clooney. Murray Lerner, who won an Oscar for his 1980 documentary From Mao to Mozart: Isaac Stern in China, developed some of his early skills at Marineland in the 1950s, working on the feature length film Secrets of the Reef. He returned in 1978 to make Sea Dream, which is shown in the attraction's Aquarius Theater (modeled, appropriately, after the Academy Awards Screening Theater in Hollywood).[18]

Negotiations had begun with a group of financiers in California even before World War II to establish a facility like Marineland near Los Angeles. Talks were resumed immediately after the war's end and Marineland of the Pacific, which opened in 1951, was operated under license from Marineland. The obvious success of the northeast Florida attraction inspired competitive efforts elsewhere, but Marineland's control of patents

STATEMENT OF SIGNIFICANCE (continued)

for various engineering and scientific processes necessary for the operation of a similar facility hindered their development. The Miami Seaquarium, which opened in 1955, had evidently gotten required information from former employes at Marineland that enabled it to operate. At that time, the Marineland Board of Directors decided upon a free exchange of information with similar attractions, hoping that they would develop findings of assistance to Marineland. All of the major marine life exhibits and attractions throughout the nation and the world -- and there are now many of them -- draw upon the scientific discoveries and techniques of showmanship originated at Marineland.[19]

The years took their toll on the founding group of Marineland. Burden retired from active participation in the late 1960s and Tolstoy died in 1970, leaving C. V. Whitney as the lone active remaining member of the three principal founders. In 1983 a newly formed Marineland Development Corporation acquired a majority of stock in the enterprise. In making the announcement, Whitney said that "with all of the changes in this field, I feel that a younger group could plan and carry through Marineland's future better than I could." The new owners, principally from St. Augustine, reaffirmed the research function of Marineland in 1984 at the dedication of recently constructed laboratories for University of Florida scientists engaged principally in the study of the marine environment.[20]

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[1] Profiles of the founders of Marine Studios were included in a special edition of the St. Augustine Record, June 23, 1938. Also, see Ralph Nading Hill, Window in the Sea (New York, 1956), 14-25, and Cornelius Vanderbilt Whitney, High Peaks (Lexington, Kentucky, 1977), 106-107.

[2] St. Augustine Record, June 30, 1939; Hill, Window, 27-28; Whitney, High Peaks, 108-109.

[3] W. Douglas Burden, "Prospectus for Marine Studios," undated manuscript, Administrative Files, Marineland of Florida, Marineland, Florida.

[4] Although tourism is Florida's largest industry, historians have given it scant attention. There is much raw material on the tourist aspects of nineteenth century St. Augustine in travel accounts and promotional literature. The only modern and acceptable treatment given the origins of tourism in the Ancient City are found in Thomas Graham, The Awakening of St. Augustine (St. Augustine, 1978), 166-218; and Jean Parker Waterbury, ed., The Oldest City (St. Augustine, 1984), chapters six and seven.

STATEMENT OF SIGNIFICANCE (continued)

[5] The New York Times, February 6, 1938.

[6] Burden, "Prospectus"; Whitney, High Peaks, 110; St. Augustine Record, July 30, 1939; The New York Times, December 11, 1938.

[7] Daytona Beach Independent, March 11, 1938; Hill, Window, 188-189; Katherine Dos Passos, "Fish, Men and Mystery," Women's Home Companion (July, 1940), 22-23.

[8] "Unconventional Aquaria," Scientific American (June, 1938), 333; G. W. Lacy, "Huge Aquariums for Marine Life," Compressed Air Magazine (December, 1938), 5771-5772.

[9] John Forney Rudy, "Underwater Zoo," Nature Notes (December, 1938), 246. Hasbrouck described the design of the tanks in a personal article in the St. Augustine Record, June 23, 1938. Henderich's obituary is in the St. Augustine Record, April 20, 1941.

[10] Michael F. Zimny, "Robert Vincent Derrah and the Nautical Moderne" (M.A. Thesis, University of Virginia, 1982), passim; St. Augustine Record, June 23, 1938.

[11] "Wonders of Submarine Life Shown in Florida Oceanarium," Paul's Netting Gazette (September, 1938), 1 and 7; Kay Halle, "Fantastic Life of the Sea Brought to Land," The New York Times Magazine (January 1, 1939), 8-9; Arthur McBride, "Meet Mister Porpoise," Natural History (January, 1940), 16-19; "Grim Drama of Undersea Life Unfolds in a Film Aquarium,," Life (July 4, 1938), 29-30.

[12] C. M. Breeder, "Observations at the Marine Studios, Bulletin of the New York Zoological Society (July-August, 1938), 123-129; interview with Dr. David Caldwell and Melba Caldwell, director and associate director of research at Marineland, December 23, 1983; seminal works on marine biology and the marine environment published in the 1950s, Rachel Carson's The Sea Around Us and John C. Lilly's Man and Dolphin, drew upon research performed at Marineland. In a letter with accompanying notes published in the British scientific journal, Deep-Sea Research, Professor William E. Schevill of the Woods Hole Oceanographic Institution credited Marineland Curator Arthur McBride with the discovery of echolocation in porpoises and with many other "significant contributions to the biology of the delphinids." William E. Schevill, "Evidence for Echolocation by Cetaceans," Deep-Sea Research (1956), 153-154.

[13] Caldwell interview; Hill, Window, 60-64; the daily field notes and recordings of water temperatures and similar phenomena taken by curator McBride remain in the files at Marineland.

STATEMENT OF SIGNIFICANCE (continued)

[14] Minutes of the Board of Directors, Marineland of Florida, May 23, 1951, Administrative Files, Marineland, Florida; Whitney, High Peaks, 111-113; St. Augustine Record, March 24, 1983.

[15] St. Augustine Record, April 25, 1943 and May 31, 1946; The New York Times, October 30, 1970 (Tolstoy's Obituary); Hill, Window, 72-73 and 177-182; St. Augustine Observer, June 1, 1946;

[16] Minutes of the Board of Directors, Marineland of Florida, May 6, 1952; Hill, Window, 177-182.

[17] Interview with Norton Baskin, former manager of the Marineland Restaurant, May 15, 1981; Hill, Window 188-189; Tallahassee Democrat, May 1, 1951; St. Augustine Record, July 14, 1954; The New York Times, May 14, 1955.

[18] St. Augustine Record, April 11 and 17, 1981.

[19] Minutes of the Board of Directors, Marineland of Florida, November 17, 1952 and November 3, 1955.

[20] The New York Times, October 30, 1970; St. Augustine Record, May 11, 1983.

BUILDER/ARCHITECT (continued):

M. F. Hasbrouck (engineer)

John Walter Wood and Fred A. Henderich (architects)

Mulford B. Foster (landscape architect)

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Drysdale, David. General Manager of Marineland. By William R. Adams in Marineland, Florida, December 22, 1983.

Rake, Wally. Maintenence Superintendant at Marineland. By Paul Weaver in Marineland, Florida, August 20, 1984.

VERBAL BOUNDARY DESCRIPTION AND JUSTIFICATION (continued)

on the north by the Flagler-St. Johns County line; on the west by a line running approximately 887 feet along Florida Highway A-1-A; and on the south by a line expending approximately 230 feet from the aforementioned A-1-A to the Atlantic Ocean.

MARINE STUDIOS, INC.

MARINELAND, FLORIDA