

**EXPLORERS CLUB FLAG REPORT FOR
THE ROGGEVEEN EXPEDITION:
An expedition in search of anchors lost on Easter Day in 1722 by
Jacob Roggeveen during his discovery of Easter Island**

By Michael C. Hilton, M.D., MN 00

DATE OF EXPEDITION: March 23, 2004 through April 17, 2004

FLAG # 50



INTRODUCTION:

On Easter Day, 1722, Dutch explorer Jacob Roggeveen while commanding three ships 1) de Africaansche Galey, 2) den Arend and 3) Thienhoven discovered Easter Island. These ships anchored on the north side of the island in a spot estimated to be one quarter of a mile off shore of what is now La Perouse Bay in 22 fathoms (132 feet) of water¹. Commander Roggeveen and his sailors stayed in the waters off Easter Island for 7 days. During their stay in these waters, they were confronted with shifting winds, which threatened the integrity of their ships. In the process of dealing with the situation, two of Commodore Roggeveen's ships (de Africaansche Galey and Thienhoven) lost anchors.²

Dutch anchors of that period were made according to the dimensions of the ship and the number of guns on the ship. Based on Dutch formulas from that period³ and the size of the ships and the number of guns on the ships that lost anchors⁴, we calculated the size of the lost anchors from the two ships. Our calculations indicate that lost anchors are approximately 10 feet in length and weigh between 700 and 1200 kilograms.

de Africaansche Galey anchor 9 feet in length and 700 kilograms

Thienhoven anchor 10.5 feet in length and 1200 kilograms

Explorers Club members have in the past searched for these anchors in La Perouse Bay. Several divers strung themselves out along the shore on one side of the bay and then swam in unison across the bay, looking for the anchors. Their description of the bay, however, indicated a sandy bottom that was more shallow and closer to shore than Jacob

¹ The Journal of Jacob Roggeveen, Sharp, Andrew (editor), page 93

² The Journal of Jacob Roggeveen, Sharp, Andrew (editor), page 105

³ Anchors, An Illustrated History, Curryer, Betty Nelson, page 44

⁴ The Journal of Jacob Roggeveen, Sharp, Andrew (editor), page 20



Moai



Anakena shore

Roggeveen documented. These Explorer's Club member divers were unsuccessful in locating the anchors.

In reviewing the description of the coordinates as mentioned in Commodore Roggeveen's diary where his ships dropped anchors, the convention of the day was to give a magnetic compass bearing of the easternmost point of land visible to the naked eye, as well as the westernmost point of land visible to the naked eye. Unfortunately, compass bearings of that period were not precise and had a built in error of +/- 11.5 degrees. The eastern most point of land was noted to be "east by south", and the western most point was listed as "west-north-west". Prior to our trip, we obtained a map of the island and constructed a clear template using Jacob Roggeveen's description of being a quarter mile offshore and the two compass bearings he also reported. We placed this template over our map and discovered that Commodore Roggeveen's description of his anchorage site was compatible with two sites off the northern coast of Easter Island. Conventional wisdom has assumed that La Perouse Bay is where the ships anchored, but a second point north of Anakena Beach also fits Commodore Roggeveen's description. Anakena Beach is 3 kilometers west of La Perouse Bay. Once on Easter Island, we were able to obtain detailed navigational charts of the island from the Chilean Navy. Indeed, these maps also indicated that the ocean was approximately one hundred thirty feet deep in the areas that we had pinpointed. We now had a defined search area and a reasonable description of the lost anchors. The primary goal of this Explorers Club Flag Expedition was to find Jacob Roggeveen's lost anchors.

In conjunction with our search for these anchors, a secondary mission was to assess the coral development off the north side of the island. Easter Island is an isolated island in the Temperate Zone of the Southern Hemisphere in waters generally thought to be too

cool for significant coral growth. A Previous examination of the coral growth around Easter Island⁵, however, indicated more coral growth than expected.



Bob Killorin @ 120 feet and Hayes Wilson on Silent Submerge DPV

MEMBERS OF THE ROGGEVEEN EXPEDITION:

Harry Brooks, FN 93
Warren Beck, FN 04
Brian Hanson, MED 84
Michael Hilton, MN 00
Bob Killorin, MN 97
Joe Rudé , FN 89
Les Sychak, MN 04
Constance Difede, MN 02
Hayes Wilson, MN 97

METHODS:

Members of the Roggeveen expedition were split up into three teams. Team A1 consisted of Bob Killorin and Hayes Wilson. Team A2 consisted of Brian Hanson, Michael Hilton and Les Sychak. Team B consisted of Harry Brooks, Warren Beck, Constance Difede, and Joe Rudé. All dive operations were coordinated through Orca Dive Shop, owned and operated by Michelle Garcia. There were two dive shops on the island, but Orca was by far the more established shop, and Michelle Garcia, the owner, is well connected with local officials and the local Chilean navy.

Dive Teams A1 and A2 typically went out first under the guidance of Michelle Garcia. Dive Team B typically went out on a second boat under the guidance of Michelle's Dive Master. Dive Team A1 used state of the art underwater diver propulsion vehicles, (Submerge Inc. UV-18). Dive Team A2 used two Apollo brand underwater dive propulsion vehicles rented through Orca Dive Shop. The underwater scooters were each

⁵ Easter Island, Scientific Exploration into the World's Environmental Problems in Microcosm, Loret, John & Tanacredi, John T. (editors), chapter 4

manned with two divers, one to drive and the other to act as a primary spotter. Dive Team B also used three Apollo brand underwater dive propulsion vehicles rented through Orca Dive Shop. These scooters were also manned with two divers each, one to drive and one to act as a primary spotter.

The search pattern was the subject of numerous discussions, with some members of the expedition preferring a grid pattern approach while other members preferred an overlapping linear approach tracking approximately one-quarter mile off the shore. Everyone was in agreement that the grid pattern approach would most likely lead to success if there were an unlimited amount of time to search in the waters off the northern coast. However, with the expedition being limited to less than two weeks and the search area being relatively large, ultimately the linear approach was chosen over the grid pattern approach since we could cover more distance in less time thereby hopefully improving our chances of success. We decided to start at Anakena Beach since La Perouse Bay had already been briefly searched by a previous group of Explorers Club members. Our linear search pattern was documented through the use of a GPS, with the first series of dives starting in waters approximately one-quarter mile out from shore with a depth of 22 fathoms (132 feet) and then further expanded to areas of the same general distance from shore but with depth variations of between 110 and 150 feet. Dive Team A1 with faster scooters and greater ranges searched the waters with a depth of 120 feet and deeper. Dive Teams A2 and B searched the waters on shallower side of the prime location strips searched by Dive Team A1. The depths in these areas ranged from 110 to 135 feet.

After 4 days of searching the waters off Anakena Beach (a strip of water approximately one kilometer long and 200 meters wide), the expedition moved its search to the waters off La Perouse Bay for 4 days and again performed a linear search approximately one-quarter mile offshore, again in waters measuring depths of between 110 and 150 feet, this time in an area 2 kilometers long and 200 meters wide.

FINDINGS:

The water temperature was consistently measured at 78 degrees. The water along the northern coast offered consistent visibility of 80 feet. The winds were variable and shifting which greatly affected the surf. The seas were typically in the 1-2 foot range but on occasions were 3-4 feet. On one day we were unable to dive because a storm created waves of 5 feet and greater. Surface conditions were noted to change rather abruptly with changing winds. It became easy to see how Jacob Roggeveen's ships lost 2 anchors when they were caught off guard with a sudden change in winds and surface conditions. The winds changed directions from a typically south to north breeze to a north to south breezes with fair regularity. Current was never an issue. Current was always less than 1 knot. While no coral reefs were observed on the northern part of the island, the coral appears to be in excellent condition. There were numerous large well-developed coral heads, some reaching dimensions of 30 feet x 30 feet. These huge coral heads were thriving in up to 160 feet of water. According to the local expert, Michelle Garcia, the extent of this coral growth was previously unknown, and we dubbed it "The Coral Jungle." It was easy to see how anchors could easily be caught and lost among these coral heads. It was also noted that the coral heads were large enough that it was easily

possible that one or both of the lost anchors might be totally encrusted in a coral head. Visibility was not a significant factor while looking for the anchors. Likewise, water conditions (including temperature, current and surf) were also not a significant issue. Depth was a moderate problem as it prevented a close continuous scrutiny of the bottom. Despite over 100 man-hours of underwater searching our mission of finding Jacob Roggeveen's lost anchors was unsuccessful.



Bob Killorin on decompression stop and Anakena moai

CONCLUSIONS:

In conclusion, the potential area in which the anchors are likely to be located is larger than was initially expected. Our estimate is that the anchors are located in an area of some 600,000 square meters. In taking this large area into consideration, as well as the average depth of 132 feet, time considerations and manpower requirements appear to be the major limiting factors. Another potentially limiting factor of concern is possibility that both of the anchors might be totally encapsulated within coral heads.

Future attempts at finding these anchors might reasonably involve the use of either a magnetometer or metal detectors. Again, due to the size of the area being searched, one would have to plan on having either a larger number of divers or a much longer planned search period. Another interesting observation was found on the Chilean Navy map which indicated that La Perouse Bay is located in an area that modern maps warn is an area of extreme magnetic variation. This information suggests that Roggeveen's compass bearings may have had a larger margin of error than we originally thought.