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## Results of the Puritan-American Museum of Natural History Expedition to Western Mexico

### 1. General Account

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#### INTRODUCTION

The Puritan-American Museum of Natural History Expedition to western Mexico was undertaken at the generous invitation of Mr. Harry J. Bauer of Los Angeles, California. The schooner "Puritan" (fig. 1) was provided for the cruise and sailed from Newport, California, on March 5, 1957, for points along the west coast of Baja California, the Tres Mariás Islands off San Blas, and in the Gulf of California. The expedition terminated three months later with the return of the ship to Newport on June 6, 1957.

The primary objectives of the expedition were to study the effects of insular isolation on populations of mammals, reptiles, and amphibians and to compare the present and past distributions of the littoral marine invertebrate faunas, particularly the mollusks, stony corals, and bryozoans. Collections of these groups were made by staff members representing four departments in the American Museum: Amphibians and Reptiles, Fishes and Aquatic Biology, Geology and Paleontology, and Mammals.

This region of western Mexico has long held the scientific interests

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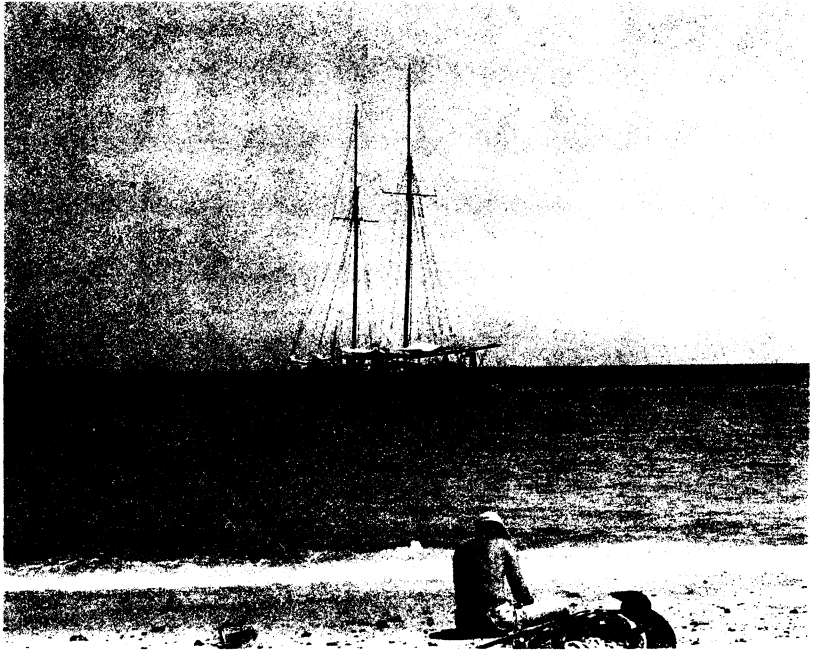


FIG. 1. Van Gelder examining a bottlenose dolphin taken off San Juanito Island in the Tres Mariás Group, with the "Puritan" anchored offshore.

of the American Museum of Natural History. Over 45 years ago, Trustee Arthur C. James made possible the cruise of the United States Bureau of Fisheries steamship "Albatross" to the Gulf of California, in 1911 (Townsend, 1916). Among the distinguished scientific personnel accompanying the "Albatross" was Dr. Harold E. Anthony, who recently retired as the Chairman of the Department of Mammals. The rich zoological collections resulting from the exploration form the basis for several reports published in the "Bulletin of the American Museum of Natural History" and elsewhere.

The scientific personnel of the present expedition was as follows: William K. Emerson, malacologist and leader, Donald F. Squires, invertebrate paleontologist, Richard G. Van Gelder, mammalogist, and Richard G. Zweifel, herpetologist, all of the American Museum of Natural History; John D. Soule, invertebrate zoologist, Allan Hancock Foundation, University of Southern California; and Oakes A. Plimpton, scientific assistant, New York City. Van Gelder, Plimpton, Zweifel, and the writer boarded the ship at Newport and were joined by Squires

and Soule at Mazatlán, where Zweifel debarked and returned to New York City. Soule left the ship at Guaymas to return to his teaching duties, and the remaining members of the scientific party disembarked at San Felipe.

The expedition's co-sponsor, Mr. Harry J. Bauer (fig. 2), who accompanied the ship as far as Mazatlán, personally saw to our every wish and actively participated in shore collecting for marine invertebrates.

The officers of the "Puritan," Capt. Henry Angelsen, Engineer Fred Schmidt, First Mate Charles Frisk, and her crew, Sverre Johannessen, Clyde Kettering, Donald Travis, and Collins Christie,<sup>1</sup> were most efficient and gave unstintingly of their time in helping to attain the expedition's objectives. Without the fine coöperation of the officers and crew members, it would have been impossible for the scientific party to have undertaken the diversified marine and terrestrial field activities for the extended period of the expedition.

Owing to the varied interests of the scientific personnel, terrestrial and oceanographic investigations were conducted simultaneously whenever possible. Herpetological collecting was mostly confined to the warmer portions of the day, and traps for small mammals were set in the late afternoon and retrieved the following morning. Hunting for larger mammals and bats was conducted largely at night, with the aid of artificial light. Observations were made on the numerous marine mammals encountered, including sea lions, elephant seals, and cetaceans. Off San Juanito Island in the Tres Mariás Group, one bottlenose dolphin was harpooned, and the skull was retained (fig. 1). Additional cetacean and several sea lion skulls were obtained from beach drift.

As for the invertebrate collecting, the results of dredging from the "Puritan" in 5 to 50 fathoms proved to be extremely successful. Dredging was accomplished off the side of the ship by using a  $\frac{3}{4}$ -inch manila rope line through a motorboat davit. The dredge, a 10-by-25-inch steel frame carrying a 4-foot net bag (fig. 3), was hauled to the surface of the water and hoisted to the sorting table (fig. 4) by means of the ship's two deck capstans. This system, although satisfactory, precluded operating at depths greater than 50 fathoms. Less rewarding were the shallow-water (1-10 fathoms) dredging operations from the outboard-powered skiff. Collections of marine invertebrates also were undertaken on shore, in the intertidal zone and by skin diving in infratidal waters. In all, 183 marine shore and oceanographic stations (Appendix 1) and

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<sup>1</sup> Frank V. Di Piazza left the ship at Mazatlán.



FIG. 2. Bauer observing sooty terns nesting on Isabel Island; man-of-war birds were nesting in the trees in the background.



FIG. 3. Captain Angelsen and members of the scientific party observing dredging operations off the "Puritan" (photograph by R. G. Van Gelder).



FIG. 4. Squires (right) and the writer removing invertebrates from the coarse screen of the dredge sorting table (photograph by R. G. Van Gelder).

81 sediment samples were made. In addition, fossil marine invertebrates, mostly mollusks, corals, echinoids, and bryozoans, were collected from 31 localities, ranging in age from Oligocene to Pleistocene. A small number of terrestrial invertebrates, including gastropods, arachnids, and insects were taken incidental to other collecting.

A photographic record, including a documentary motion picture, of the activities was undertaken by members of the scientific party (fig. 5). Unless otherwise stated, the photographs appearing in this paper were taken by the writer. The locality map was drafted by Mrs. Frances Zweifel.

The "Puritan," although designed as a yacht, proved to be an adequate base for the expedition's operations. She is a diesel schooner, 102 feet, 9 inches in over-all length, with a beam of 22 feet, 10 inches, and a gross weight of 101 tons. Drawing 9 feet, she made about 7 knots per hour under engine power in a mild sea.

For the purposes of the expedition, she carried three small craft, an inboard motorboat, and two outboard motorboats: one a 16-foot Lyman runabout and the other a 14-foot skiff. The "Clinker-Built" runabout was used primarily for shore landings, while the work skiff was out-

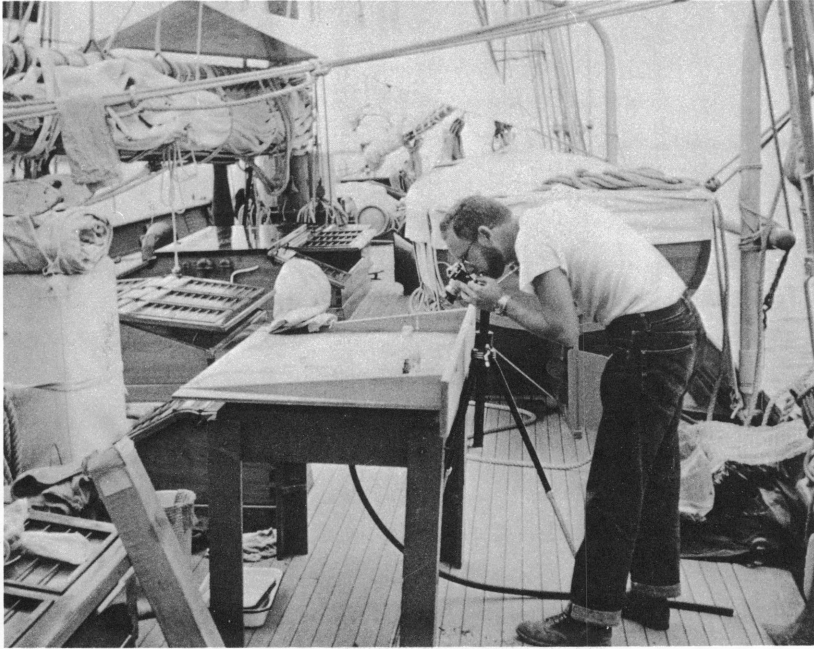


FIG. 5. Zweifel photographing herpetological specimens on board the "Puritan."

fitted for shallow-water dredging with a 6-foot "A" frame at the stern and a small winch powered by a gasoline engine.

### ITINERARY

The route of the expedition and the localities at which anchorage stops or near-shore reconnaissance were undertaken are shown in figure 6; the place names of the localities visited are indicated in the explanation to this figure.<sup>1</sup> The return route from San Felipe to Newport Bay, via stops at La Paz and San Diego, is not indicated on the locality map. A total of 4032 miles was logged by the "Puritan."

For the purposes of discussion the trip may be divided into two parts. The first was devoted largely to collecting on certain of the off-shore islands, the Magdalena Bay region of Baja California, and the Tres Mariás Islands off San Blas, with incidental stops at points en

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<sup>1</sup> The spelling of geographical names follows the usage of the American Geographical Society's "Index to Map of Hispanic America" (vol. 2, Geographical names in Mexico, pp. 1-181, E. P. Hanson, editor, 1944).

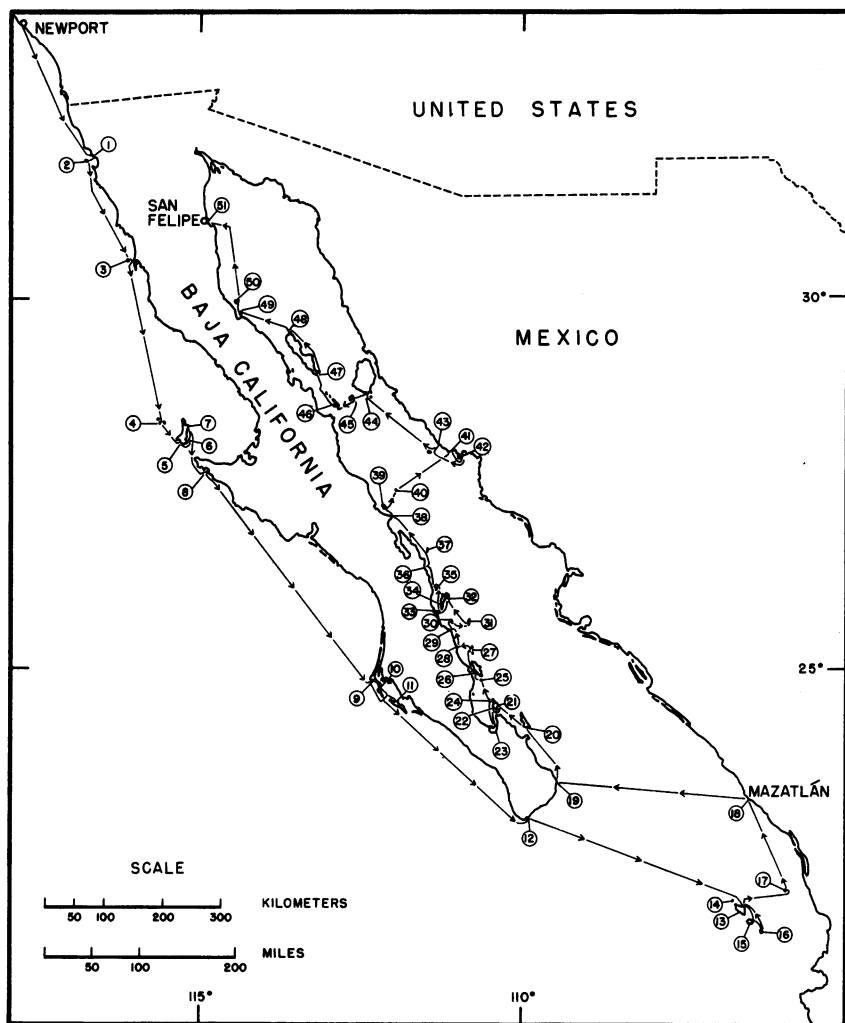


FIG. 6. Route of the Puritan-American Museum of Natural History Expedition. The localities visited are indicated by numbered circles and are as follows:

- |                             |  |
|-----------------------------|--|
| 1. Todos Santos Bay         | 7. Lighthouse, Cedros Island           |
| 2. Todos Santos Islands     | 8. Turtle Bay (= Bahía San Bartolomé)  |
| 3. San Martín Island        | 9. Santa María Bay                     |
| 4. West San Benito Island   | 10. Puerto Magdalena, Magdalena Island |
| 5. South Bay, Cedros Island |  |
| 6. Village, Cedros Island   |  |



route to Mazatlán. The second part, the major portion of the trip, was an extended survey of the Gulf of California area during which 32 localities, including most of the islands, were visited.

The numerals contained in brackets occurring in the itineraries given below refer to the numbered stops on the locality map (fig. 6).

## PART 1

### WEST COAST AND ISLANDS OF BAJA CALIFORNIA

MARCH 6 TO MARCH 22, 1957

- March 6: Todos Santos Bay [1]; South Todos Santos Island [2].  
 March 7: Todos Santos Islands; en route to San Martín Island.  
 March 8: San Martín Island [3]; en route to San Benito Islands.  
 March 9: West San Benito Island [4]; South Bay, Cedros Island [5].  
 March 10: South Bay, Cedros Island.  
 March 11: East side of Cedros Island off village [6]; and south of lighthouse [7].  
 March 12-13: Turtle Bay (Bahía San Bartolomé) [8]; en route to Ascención Island (March 13), bad weather, continued on to Santa María Bay.

- |   |  |
|---|--|
| 11. Puerto Cortes, Santa Margarita Island                   | 32. Salinas Bay, Carmen Island                                   |
| 12. San Lucas Bay   | 33. Puerto Escondido (Danzante Island)                           |
| 13. Puerto Balleto, María Madre Island                      | 34. Marquer Bay, Carmen Island                                   |
| 14. San Juanito Island                                      | 35. Coronados Island   |
| 15. María Magdalena Island                                  | 36. Pulpito Point  |
| 16. María Cleofas Island                                    | 37. Ildefonso Island   |
| 17. Isabel Island   | 38. Santa Inez Island  |
| 18. Mazatlán  | 39. San Marcos Island  |
| 19. Los Frailes Bay   | 40. Tortuga Island   |
| 20. Cerralvo Island   | 41. San Carlos Bay   |
| 21. Espíritu Santo Island (southeast side)                  | 42. Guaymas  |
| 22. San Gabriel Bay, Espíritu Santo Island (Ballena Island) | 43. San Pedro Bay (San Pedro Nolasco Island)                     |
| 23. La Paz  | 44. Tiburón Island   |
| 24. Isla Partida  | 45. San Esteban Island   |
| 25. San Francisco Island                                    | 46. South San Lorenzo Island                                     |
| 26. Amortajada Bay, San José Island                         | 47. Angel de la Guarda Island (southeastern tip, Partida Island) |
| 27. San Diego Island  | 48. Puerto Refugio, Angel de la Guarda Island                    |
| 28. San Carlos Bay (Santa Cruz Island)                      | 49. Gonzaga Bay (=San Luis Gonzales Bay)                         |
| 29. Aqua Verda Bay  | 50. San Luis Island  |
| 30. Monserrate Island                                       | 51. San Felipe   |
| 31. Santa Catalina Island                                   |  |

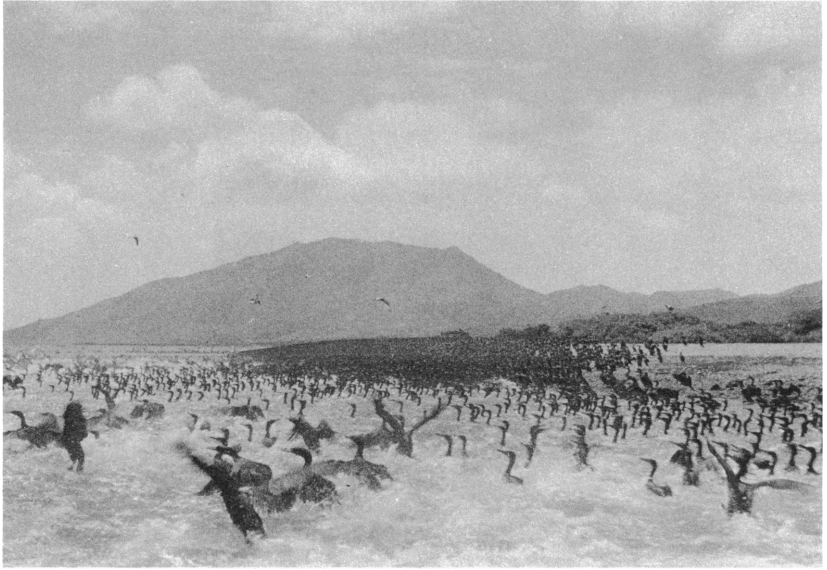


FIG. 7. Part of the vast flock of comorants observed at Santa Margarita Island, Baja California.

March 14–15: Santa María Bay (2 miles north of Point Hughes) [9].

March 16–18: Magdalena Bay, off Puerto Magdalena, Magdalena Island [10]; en route to Santa Margarita Island (March 18).

March 18–20: Magdalena Bay, off Puerto Cortes, Santa Margarita Island [11]; en route to Cape San Lucas (March 20).

March 21–22: San Lucas Bay [12]; en route to the Tres Marias Islands (March 22).

During most of this period, cold weather and generally overcast skies were encountered. These conditions, together with morning and evening fogs, contributed to poor herpetological collecting results.

The inclement weather, together with attendant rough seas, precluded making the originally scheduled stops at Scammon Lagoon and Ascensión Island, but provided for more time in the protected Magdalena Bay area, where collections of mammals, reptiles, and modern and fossil invertebrates were made. One of the most spectacular sights seen on the trip was the vast flock of cormorants inhabiting the west side of Santa Margarita Island (fig. 7). The presence there of literally tens of thousands of these birds colored the beach and adjacent water jet black and provides for local commercial exploitation of the guano.

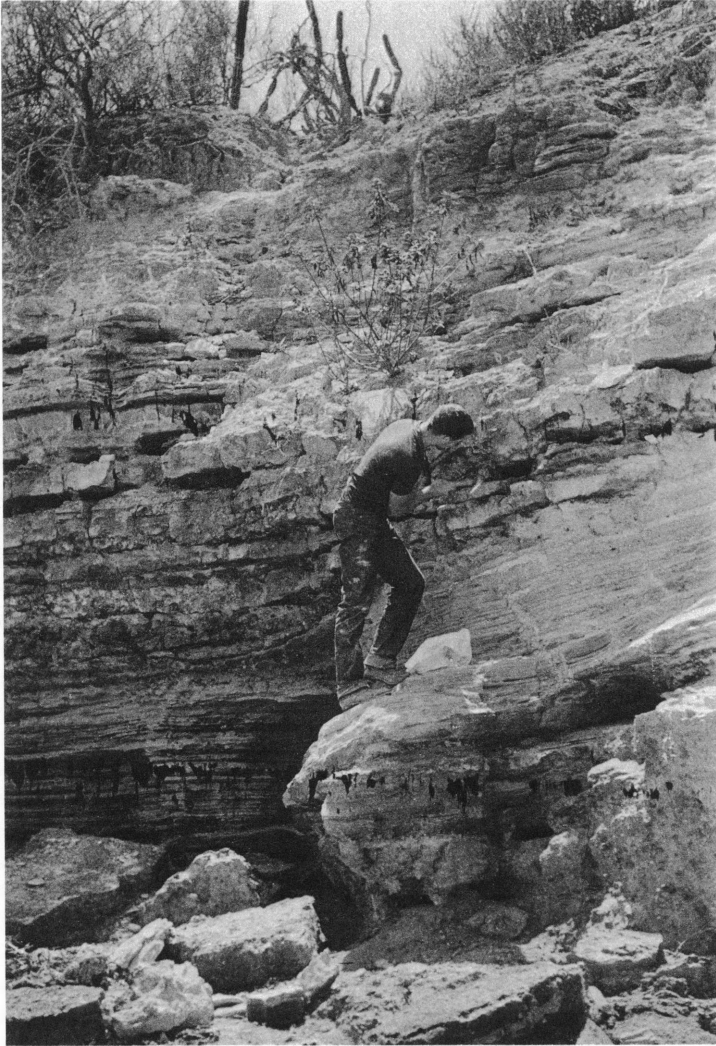


FIG. 8. Plimpton collecting fossil invertebrates of Pliocene age from an exposure discovered on María Cleofas Island, Tres María Group.

TRES MARÍAS ISLANDS TO MAZATLÁN  
MARCH 23 TO APRIL 9, 1957

March 23–26: Off Puerto Balleto, María Madre Island [13]; en route to San Juanito Island (March 26).

March 26–28: San Juanito Island [14]; en route to María Magdalena Island (March 28).

March 28: "Gringo Bay," west side of María Magdalena Island, off southeast side of María Magdalena Island [15].

March 29–30: Off southeast side of María Magdalena Island.

March 31–April 1: Off east side of María Magdalena Island.

April 2–5: Northeast side of María Cleofas Island [16]; en route to María Madre Island (April 5).

April 5–8: Off Puerto Balleto, María Madre Island; en route to Isabel Island (April 8).

April 8–9: Isabel Island [17]; en route to Mazatlán, Sinaloa [18].

We were fortunate to arrive at the anchorage off the east side of María Madre Island before the height of a storm which lasted several days and delayed landing on shore for a day. Through the excellent coöperation of the authorities at the Government of Mexico penal colony of Puerto Balleto, we were provided with motor transportation to outlying parts of María Madre Island and allowed to solicit the services of inmates as guides and collectors. Many valuable specimens were purchased with the assistance of Sr. Alfonso K. Benevides.

Although we arrived during the dry season, general collecting proved to be quite fruitful. Probably the most significant discovery was the finding of the first known amphibians in these islands. Richly fossiliferous deposits that apparently are the same age as the Pliocene invertebrate faunas reported by Jordan and Hertlein (1926) from María Madre Island were found on María Cleofas Island (fig. 8). Intensified collecting during the rainy season undoubtedly would prove to be extremely rewarding.

En route to Mazatlán, we paid a short visit to Isabel Island, a famous bird rookery. Here we encountered great numbers of man-of-war birds and sooty terns (fig. 2) nesting.

## PART 2

### GULF OF CALIFORNIA

APRIL 10 TO MAY 26, 1957

April 10–16: Mazatlán Harbor, Sinaloa; en route to Los Frailes Bay, Baja California (April 16).

April 17–20: Los Frailes Bay [19]; Pulmo Reef, en route to Cerralvo Island (April 20).

April 20–21: Cerralvo Island [20]; en route to Espíritu Santo Island (April 21)

April 21: Southeast side of Espíritu Santo Island [21].

April 22: San Gabriel Bay, west side of Espíritu Santo Island [22].

April 23–24: La Paz Harbor, Baja California [23]; en route to Isla Partida (April 24).

- April 24: Isla Partida [24]; Ballena Island; return to La Paz Harbor.  
April 25-26: La Paz; en route to Isla Partida (April 26).  
April 26-27: Isla Partida [24]; en route to San Francisco Island (April 27).  
April 27-28: Southeast side of San Francisco Island [25]; en route to San José Island (April 28).  
April 28-29: Amortajada Bay, southwest side of San José Island [26]; en route to San Diego Island (April 29).  
April 29-30: South side of San Diego Island [27]; en route to Santa Cruz Island (April 30).  
April 30: Santa Cruz Island (no suitable anchorage), returned to San Diego Island for anchorage.  
May 1: Returned to Santa Cruz Island to retrieve mammal traps; anchored north of San Carlos Bay, Baja California [28].  
May 2-3: Agua Verde Bay, Baja California [29]; southwest side of Monserrate Island [30]; en route to Santa Catalina Island (May 3).  
May 3: Southwest side of Santa Catalina Island [31].  
May 4-5: Salinas Bay, Carmen Island [32]; en route to Puerto Escondido (May 5).  
May 5-6: Puerto Escondido, Baja California [33]; en route to Marquer Bay, Carmen Island (May 6).  
May 6-7: Marquer Bay, Carmen Island [34]; Danzante Island; en route to Coronados Island (May 7).  
May 7-8: West side of Coronados Island [35]; en route to Ildefonso Island (May 8).  
May 8-9: Ildefonso Island (no anchorage); anchored south of Pulpito Point, Baja California [36]; returned to Ildefonso Island [37] to retrieve mammal traps (May 9).  
May 9: South Santa Inez Island [38]; en route to San Marcos Island.  
May 10-11: Southeast tip of San Marcos Island [39]; Tortuga Island [40] (no anchorage); returned to San Marcos Island for anchorage; returned to Tortuga Island to retrieve mammal traps (May 11); en route to San Carlos Bay, Sonora (May 11).  
May 12: San Carlos Bay [43]; en route to Guaymas, Sonora.  
May 12-14: Guaymas Harbor [42]; en route to San Pedro Nolasco Island (May 14).  
May 14-15: San Pedro Nolasco Island (no anchorage); San Pedro Bay, Sonora [43] (anchorage); returned to San Pedro Nolasco Island (May 15); en route to San Pedro Martir Island (weather unfavorable for anchorage), continued to Tiburón Island (May 15).  
May 16-18: South side of Tiburón Island [44]; Turner's Island; en route to San Esteban Island (May 18).  
May 18-19: East side of San Esteban Island [45]; en route to South San Lorenzo Island (May 19).  
May 19-20: West side of South San Lorenzo Island [46]; southeast tip of Angel de la Guarda Island [47] (May 20); east side of Partida Island (May 20).  
May 21-22: Returned to southeast tip of Angel de la Guarda Island to retrieve mammal traps; Puerto Refugio, Angel de la Guarda Island [48]; Mejia Island; en route to Gonzaga Bay (May 22).

May 22-23: Gonzaga Bay (San Luis Gonzales Bay), Baja California [49]; en route to San Luis Island (May 23)

May 23-24: San Luis Island [50]; en route to San Felipe (May 24)

May 24-25: San Felipe Bay [51]; scientific personnel disembarked (May 25).

May 25-June 6: En route to Balboa, California, via La Paz and San Diego.

The second part of the expedition was largely devoted to a rapid reconnaissance of most of the numerous islands in the Gulf of California. Mammal trap lines were set on nearly all the islands visited. As was to be expected, the success of the trapping varied considerably from place to place. In the absence of the herpetologist, incidental collecting of reptiles was continued by the scientific personnel and several members of the crew.

Owing to our ambitious schedule, dredging from the "Puritan" was restricted because of the requirement of remaining overnight at each station where traps were placed and thus necessitating travel from island to island largely during the daylight hours. Nevertheless, the results of the limited dredging operations proved profitable in most instances (fig. 9). Skin-diving activities, which were begun in the warm waters of the Tres Marías Islands, were continued and intensified in the Gulf area, with excellent results.

A number of previously unrecorded fossiliferous Tertiary and Pleistocene exposures were discovered, and other known localities were visited. Large collections of invertebrate fossils were made from several Cenozoic deposits, ranging from Oligocene to Pleistocene in age.

Although fair to good weather conditions prevailed, unseasonably strong winds were intermittently encountered during this part of the trip. Fortunately, these storms did not materially interrupt the progress of the expedition.

### SUMMARY

The "Puritan" left Newport, California, on March 5 and returned, after logging 4032 miles, on June 6, 1957. During this three-month period, 50 different collecting localities were visited, with the result that 183 marine stations (Appendix 1), 31 fossil invertebrate stations, and 81 sediment stations were established. In addition to the large collections of Recent and fossil invertebrates procured, more than 450 mammal specimens and over 400 herpetological specimens were taken.

The success of the expedition is largely due to the generosity of Mr. Bauer, the excellent coöperation of Captain Angelsen and the members of the crew, and the kind consideration of the officials of the Government of Mexico. The members of the scientific party are par-



FIG. 9. Soule preparing bryozoan specimens for the report on the expedition's vast collection of this group.

ticularly indebted to Mr. Oakes A. Plimpton for his invaluable assistance.

The scientific reports on the results of the expedition will appear in subsequent numbers of "American Museum Novitates" and in the "Bulletin of the American Museum of Natural History."

#### APPENDIX 1: DESCRIPTIONS OF MARINE COLLECTING STATIONS

Recent invertebrates were taken by drag-dredging off the "Puritan"

and a 14-foot skiff, by shore and intertidal collecting, and by skin diving. The dredge frames were fitted with  $\frac{1}{4}$ -inch mesh cotton nets, and a finer mesh cloth was inserted inside the dredge sacs on some of the deeper hauls off the "Puritan." Bottom temperatures are indicated for certain of the shallow-water stations.

For the 183 stations listed below, the following format is followed: (1) general locality description, (2) position in terms of latitude and longitude, (3) depth of water, (4) type of substratum, (5) temperature of water at bottom, (6) month and day of collection in 1957, and (8) method of collection.

STATION 1: Off southeast side of South Todos Santos Island,  $31^{\circ} 48' N.$ ,  $116^{\circ} 47' 50'' W.$ , 10 fathoms, sand and gravel, March 6, "Puritan" dredge.

STATION 2: South Bay, Cedros Island,  $28^{\circ} 05' N.$ ,  $115^{\circ} 20' W.$ , 5-10 fathoms, sand and rock, March 10, skiff dredge.

STATION 3: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 40'' N.$ ,  $112^{\circ} 15' 20'' W.$ , 5.5 fathoms, fine sand,  $16^{\circ} C.$ , March 14, skiff dredge.

STATION 4: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 30'' N.$ ,  $112^{\circ} 14' 36'' W.$ , 6-7 fathoms, fine sand,  $16^{\circ} C.$ , March 14, skiff dredge.

STATION 5: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 48'' N.$ ,  $112^{\circ} 15' 18'' W.$ , 5.5 fathoms, fine sand,  $16^{\circ} C.$ , March 14, skiff dredge.

STATION 6: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 48'' N.$ ,  $112^{\circ} 14' 54'' W.$ , 5.5 fathoms, fine sand,  $16^{\circ} C.$ , March 14, skiff dredge.

STATION 7: Santa María Bay, Magdalena Island,  $24^{\circ} 47' 00'' N.$ ,  $112^{\circ} 15' 36'' W.$ , 1-2 fathoms, fine sand,  $17^{\circ} C.$ , March 15, skiff dredge.

STATION 8: Santa María Bay, Magdalena Island,  $24^{\circ} 47' 00'' N.$ ,  $112^{\circ} 15' 18'' W.$ , 3-4 fathoms, fine sand,  $16^{\circ} C.$ , March 15, skiff dredge.

STATION 9: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 36'' N.$ ,  $112^{\circ} 14' 54'' W.$ , 5.5 fathoms, fine sand,  $16^{\circ} C.$ , March 15, skiff dredge.

STATION 10: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 18'' N.$ ,  $112^{\circ} 15' 24'' W.$ , 5.5 fathoms, fine sand,  $16^{\circ} C.$ , March 15, skiff dredge.

STATION 11: South side of Hughes Point, Magdalena Island,  $24^{\circ} 47' 00'' N.$ ,  $112^{\circ} 16' 12'' W.$ , tidal zone, rocky shore,  $15.5^{\circ} C.$ , March 15, intertidal collecting.

STATION 12: Santa María Bay, Magdalena Island,  $24^{\circ} 46' 12'' N.$ ,  $112^{\circ} 15' 48'' W.$ , 3-4 fathoms, sand and rock,  $16^{\circ} C.$ , March 15, skiff dredge.

STATION 13: Santa María Bay, Magdalena Island,  $24^{\circ} 45' 36'' N.$ ,  $112^{\circ} 15' 30'' W.$ , 3.5-5 fathoms, fine sand, March 15, skiff dredge.

STATION 14: Santa María Bay, Magdalena Island,  $24^{\circ} 45' 54'' N.$ ,  $112^{\circ} 15' 24'' W.$ , 7 fathoms, fine sand, March 15, skiff dredge.

STATION 15: Off Howlands Bluff, Magdalena Island,  $24^{\circ} 40' 18'' N.$ ,  $112^{\circ} 11' 24'' W.$ , 14 fathoms, rocky, March 16, "Puritan" dredge.

STATION 16: Off Cape Corso, Magdalena Island,  $24^{\circ} 38' 12'' N.$ ,  $112^{\circ} 10' 30'' W.$ , 12.5 fathoms, rocks, March 16, "Puritan" dredge.

STATION 17: Off Red Point, Magdalena Island,  $24^{\circ} 36' 54'' N.$ ,  $112^{\circ} 10' 00'' W.$ , 22 fathoms, rocky, March 16, "Puritan" dredge.

STATION 18: Off Puerto Magdalena, Magdalena Island, Magdalena Bay,



24° 38' 00" N., 112° 08' 24" W., 6-8 fathoms, fine sand and mud, 16° C., March 17, skiff dredge.

STATION 19: Off Point Cove, Magdalena Island, Magdalena Bay, 24° 36' 30" N., 112° 06' 54" W., 4-7 fathoms, rocky, 16° C., March 17, skiff dredge.

STATION 20: North of Point Belcher, Magdalena Island, Magdalena Bay, 24° 35' 42" N., 112° 05' 30" W., 6.5-9 fathoms, gravel and rocks, 16° C., March 17, skiff dredge.

STATION 21: Off Point Belcher, Magdalena Island, Magdalena Bay, 24° 35' 06" N., 112° 05' W., 9 fathoms, gravel, rock, and sand, 16° C., March 17, skiff dredge.

STATION 22: North of Puerto Magdalena, Magdalena Island, 24° 38' 36" N., 112° 08' 54" W., tidal zone, rocky, March 17, intertidal collecting.

STATION 23: About 1 mile south of Puerto Cortes, Santa Margarita Island, 24° 38' 00" N., 111° 48' 54" W., tidal zone, cobbles, 16.1° C., March 18, intertidal collecting.

STATION 24: About 1 mile south of Puerto Cortes, Santa Margarita Island, 24° 38' 00" N., 112° 08' 54" W., 0.5-1 fathom, cobbles, March 20, skin diving.

STATION 25: Off lighthouse, south of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 36' N., 106° 34' W., 0.5-1 fathom, rocky, March 25, skin diving.

STATION 26: Between hospital and lighthouse, south of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 35' 50" N., 106° 34' W., tidal zone, rocks and sand, March 25, intertidal collecting.

STATION 27: Puerto Balleto, María Madre Island, Tres Marías Group, 21° 36' N., 106° 34' W., beach, sand and rocks, March 25, shore collecting.

STATION 28: About 3 miles north of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 38' N., 106° 34' W., 10 fathoms, gravel and coarse sand, 22° C., March 26, skiff dredge.

STATION 29: About 3 miles north of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 38' N., 106° 34' W., 8-10 fathoms, sand and rock, 22° C., March 26, skiff dredge.

STATION 30: Three to 4 miles north of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 38' N., 106° 34' W., 8 fathoms, rocks, 22° C., March 26, skiff dredge.

STATION 31: About 3 miles north of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 38' N., 106° 34' W., 7-10 fathoms, gravel and rocks, 22° C., March 26, skiff dredge.

STATION 32: Off creek bed about 2 miles north of Puerto Balleto, María Madre Island, Tres Marías Group, 21° 37' N., 106° 34' W., 0.5-2 fathoms, sand and rocks, 23° C., March 26, skin diving.

STATION 33: Below salt works, south side of María Madre Island, Tres Marías Group, 21° 33' 30" N., 106° 32' W., tidal zone, rocky ledges, March 26, intertidal collecting.

STATION 34: Puerto Balleto, María Madre Island, Tres Marías Group, 21° 36' N., 106° 34' W., beach, March 26, shore collecting.

STATION 35: Off southeastern side of San Juanito Island, Tres Marías Group, 21° 42' 30" N., 106° 41' 00" W., 0.5-3 fathoms, March 27, skin diving.

STATION 36: Southeastern side of San Juanito Island, Tres Marías Group,

21° 42' 30" N., 106° 41' 00" W., 0–0.5 fathom, rocky, March 27, intertidal collecting.

STATION 37: About ½ mile from southeastern end of San Juanito Island, Tres Marias Group, 21° 42' N., 106° 41' W., 3–5 fathoms, sand and rocks, 22° C., March 27, skiff dredge.

STATION 38: Off southeastern end of San Juanito Island, Tres Marias Group, 21° 42' N., 106° 41' W., 9–11 fathoms, sand and gravel, 22° C., March 27, skiff dredge.

STATION 39: Off southeastern end of San Juanito Island, Tres Marias Group, 21° 42' N., 106° 41' W., 8–10 fathoms, gravel, 22° C., March 27, skiff dredge.

STATION 40: Off southeastern end of San Juanito Island, Tres Marias Group, 21° 42' N., 106° 41' W., 5 fathoms, sand and gravel, 22° C., March 27, skiff dredge.

STATION 41: Off southeastern end of San Juanito Island, Tres Marias Group, 21° 42' N., 106° 41' W., 0.5–4 fathoms, sand and rocks, March 27, skin diving.

STATION 42: "Gringo Bay," west side of María Magdalena Island, Tres Marias Group, 21° 33' N., 106° 30' W., 5–7 fathoms, 23° C., fine sand, March 28, skiff dredge.

STATION 43: "Gringo Bay," west side of María Magdalena Island, Tres Marias Group, 21° 33' N., 106° 30' W., 9–11 fathoms, fine sand, 23° C., March 28, skiff dredge.

STATION 44: Off southeast side of María Magdalena Island, Tres Marias Group, 21° 24' N., 106° 26' W., 4.5–6 fathoms, rocks, 23° C., March 29, skiff dredge.

STATION 45: Off southeast side of María Magdalena Island, Tres Marias Group, 21° 24' N., 106° 26' W., 9 fathoms, rocks, 24° C., March 29, skiff dredge.

STATION 46: Off southeast side of María Magdalena Island, Tres Marias Group, 21° 24' N., 106° 26' W., 0.5–3 fathoms, rocks, March 29, skin diving.

STATION 47: Southeast side of María Magdalena Island, Tres Marias Group, 21° 25' 30" N., 106° 23' 45" W., 0–0.5 fathom, rock (volcanic and shale) ledges forming a "reef," March 29, intertidal collecting.

STATION 48: Southeast side of María Magdalena Island, Tres Marias Group, 21° 25' 30" N., 106° 23' 45" W., beach, coral and sand, March 29, shore collecting.

STATION 49: Off east side of María Magdalena Island, Tres Marias Group, 21° 28' N., 106° 24' W., 9–11 fathoms, sand, 22° C., March 31, skiff dredge.

STATION 50: Off east side of María Magdalena Island, Tres Marias Group, 21° 28' N., 106° 24' W., 5–7 fathoms, sand, 23° C., March 31, skiff dredge.

STATION 51: Off east side of María Magdalena Island, Tres Marias Group, 21° 28' N., 106° 24' W., 3–4 fathoms, sand, 23.5° C., March 31, skiff dredge.

STATION 52: East side of María Magdalena Island, Tres Marias Group, 21° 27' N., 106° 24' 45" W., beach, sand, March 31, shore collecting.

STATION 53: Off Low Point, east side of María Magdalena Island, Tres Marias Group, 21° 28' N., 106° 24' W., 1–3 fathoms, sand, 23° C., April 1, skiff dredge.

STATION 54: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 6 fathoms, sand, 22° C., April 1, skiff dredge.

STATION 55: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 11 fathoms, sand, 22° C., April 1, skiff dredge.

STATION 56: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 6.5 fathoms, sand, 23° C., April 1, skiff dredge.

STATION 57: About 2 miles northwest of Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 4–6 fathoms, sand, 22° C., April 1, skiff dredge.

STATION 58: About 2 miles northwest of Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 7–8 fathoms, sand, April 1, skiff dredge.

STATION 59: Off Low Point, east side of María Madre Island, Tres Mariás Group, 21° 28' N., 106° 23' W., 22–24 fathoms, fine sand, April 2, "Puritan" dredge.

STATION 60: Small cove north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 16' N., 106° 15' 50" W., tidal zone, rocks and sand, April 2, intertidal collecting.

STATION 61: About 2 miles north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 16' N., 106° 14' W., 5 fathoms, rocks, April 3, skiff dredge.

STATION 62: About 2 miles north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 16' N., 106° 14' W., 9–10 fathoms, rocks, 22° C. (surface, 23° C.), April 3, skiff dredge.

STATION 63: About 2 miles north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 16' N., 106° 14' W., 3–4 fathoms, rocks, April 3, skiff dredge.

STATION 64: About ½ mile north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 15' N., 106° 14' W., 9–12 fathoms, rocks, April 3, skiff dredge.

STATION 65: Small cove, north of Yellow Bluff, east side of Cleofas Island, Tres Mariás Group, 21° 16' N., 106° 15' 50" W., beach, sand, April 4, shore collecting.

STATION 66: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 22' N., 106° 24' W., 35 fathoms, fine sand, April 5, "Puritan" dredge.

STATION 67: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 28 fathoms, fine sand, April 5, "Puritan" dredge.

STATION 68: Off Low Point, east side of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 20 fathoms, fine sand, April 5, "Puritan" dredge.

STATION 69: Off Low Point, east coast of María Magdalena Island, Tres Mariás Group, 21° 28' N., 106° 24' W., 22–25 fathoms, sand, April 5, "Puritan" dredge.

STATION 70: Off Low Point, east coast of María Magdalena Island, Tres

Marias Group, 21° 28' N., 106° 24' W., 20–24 fathoms, sand, April 5, "Puritan" dredge.

STATION 71: Off Low Point, east side of María Magdalena Island, Tres Marias Group, 21° 28' N., 106° 24' W., 13–15 fathoms, coarse sand, April 5, "Puritan" dredge.

STATION 72: Off Arroyo Hondo, east side of María Madre Island, Tres Marias Group, 21° 40' N., 106° 35' W., 14–15 fathoms, coarse sand, April 8, "Puritan" dredge.

STATION 73: Off Arroyo Hondo, east side of María Madre Island, Tres Marias Group, 21° 40' N., 106° 35' W., 6–10 fathoms, coarse sand, coral, April 8, "Puritan" dredge.

STATION 74: Off Arroyo Hondo, east side of María Madre Island, Tres Marias Group, 21° 40' N., 106° 35' W., 15–16 fathoms, coarse sand, April 8, "Puritan" dredge.

STATION 75: Off southeast side of Isabel Island, 21° 54' N., 105° 53' W., 0.5–3.5 fathoms, rocks (volcanic), 21.75° C. (surface), April 9, skin diving.

STATION 76: North side of Olas Altas Bay, Mazatlán, Sinaloa, 23° 12' N., 106° 26' 55" W., tidal zone, rocks, April 12, intertidal collecting.

STATION 77: About 300 meters south of Signal Station Point, west side of Cape Vigia, Mazatlán, Sinaloa, 23° 11' 15" N., 106° 26' 50" W., 0.5–1.5 fathoms, rocks, April 14, skin diving.

STATION 78: North side of Olas Altas Bay, Mazatlán, Sinaloa, 23° 12' N., 106° 26' 55" W., rocks, tidal zone, 23.3° C., April 13 and 15, intertidal collecting.

STATION 79: East of South Bluff, Creston Island, Mazatlán, Sinaloa, 23° 10' 30" N., 106° 26' 45" W., rocks, tidal zone, 22° C., April 15, intertidal collecting.

STATION 80: Off South Bluff, Creston Island, Mazatlán, Sinaloa, 23° 10' 30" N., 106° 26' 45" W., 0.75–2.5 fathoms, rocks, April 15, skin diving.

STATION 81: About 400 feet west of White Top Rock light, Mazatlán Harbor, Sinaloa, 23° 11' 45" N., 106° 25' 45" W., 3 fathoms, mud, 22° C., April 15, skiff dredge.

STATION 82: About 600 yards west of northern point of Azada Island, Mazatlán Harbor, Sinaloa, 23° 11' N., 106° 27' W., 7 fathoms, mud, 22° C., April 15, skiff dredge.

STATION 83: Olas Altas Bay, Mazatlán, Sinaloa, 23° 12' N., 106° 27' W., 3.5 fathoms, sand, 22° C., April 15, skiff dredge.

STATION 84: Los Frailes Bay, Baja California, 23° 21' N., 109° 25' W., sand and rocks, tidal zone, 21.6° C., April 17, intertidal collecting.

STATION 85: North side of Los Frailes Bay, Baja California, 23° 21' N., 109° 25' 30" W., 3 fathoms, boulders, 22.5° C. (22.0° C. surface), April 17, skin diving.

STATION 86: Off mouth of wash, west side of Los Frailes Bay, Baja California, 23° 21' N., 109° 25' 30" W., 1.25 fathoms, sand and rocks, 22° C., April 17, skin diving.

STATION 87: Pulmo Reef, Baja California, 23° 26' N., 109° 25' W., 2–4 fathoms, rocks, 21.5° C. (22.0° C., surface), April 18, skin diving.

STATION 88: Los Frailes Bay, Baja California, 23° 21' N., 109° 25' W., 7–9 fathoms, sand and pebbles, April 19, "Puritan" dredge.

STATION 89: Los Frailes Bay, Baja California, 23° 21' N., 109° 25' W., 20-40 fathoms, fine sand, April 19, "Puritan" dredge.

STATION 90: Off southwest side of Cerralvo Island, 24° 09' N., 109° 50' W., 2-3.5 fathoms, sand and rocks, 22.5° C. (23.5° C., surface), April 20, skin diving.

STATION 91: Between Lupon Point and Bonanza Point, southeast side of Espíritu Santo Island, 24° 26' N., 110° 20' 30" W., tidal zone, sand and rocks, 23.8° C., April 21, intertidal collecting.

STATION 92: Between Lupon Point and Bonanza Point, southeast side of Espíritu Santo Island, 24° 26' N., 110° 20' 30" W., beach, sand, April 21, shore collecting.

STATION 93: San Lorenzo Reef, San Lorenzo Channel, 24° 23' 30" N., 110° 18' W., 2 fathoms, boulders, 21.5° C. (22.5° C., surface), April 21, skin diving.

STATION 94: South of Bonanza Point, southeast side of Espíritu Santo Island, 24° 25' N., 110° 15' 30" W., 2-2.5 fathoms, sand and rocks, 21.0° C. (22.0° C. surface), April 21, skin diving.

STATION 95: North of Bonanza Point, southeast side of Espíritu Santo Island, 24° 26' N., 110° 17' 30" W., 5-9 fathoms, coarse sand, April 22, "Puritan" dredge.

STATION 96: Off Bonanza Point, southeast side of Espíritu Santo Island, 24° 26' N., 110° 18' W., 10-12 fathoms, coarse sand and calcareous algae, April 22, "Puritan" dredge.

STATION 97: Off Dispensa Point, south of San Gabriel Bay, west side of Espíritu Santo Island, 24° 23' N., 110° 21' W., 24-26 fathoms, fine sand and mud, April 22, "Puritan" dredge.

STATION 98: San Gabriel Bay, west side of Espíritu Santo Island, 24° 25' N., 110° 21' W., 1-1.5 fathoms, coarse sand and rocks, 23.5° C., April 22, skin diving.

STATION 99: San Gabriel Bay, west side of Espíritu Santo Island, 24° 26' N., 110° 21' W., tidal zone, coarse sand and rocks, April 22, intertidal collecting.

STATION 100: Small cove, south side of Isla Partida, 24° 32' N., 110° 23' W., 1 fathom, sand and rocks, April 24, skin diving.

STATION 101: Channel, south side of Isla Partida, 24° 31' 45" N., 110° 22' 30" W., tidal zone, coarse sand and rocks, April 24, intertidal collecting.

STATION 102: West side of Ballena Island, 24° 29' N., 110° 24' W., 1.25-2 fathoms, rocks, April 24, skin diving.

STATION 103: Channel, south side of Isla Partida, 24° 31' N., 110° 23' W., 12-13 fathoms, coarse sand, 22.5° C., April 24, skiff dredge.

STATION 104: Channel, south side of Isla Partida, 24° 31' N., 110° 23' W., 13 fathoms, coarse sand, April 24, skiff dredge.

STATION 105: Channel, south side of Isla Partida, 24° 31' N., 110° 23' W., 3-5 fathoms, sand, April 24, skiff dredge.

STATION 106: Channel, south side of Isla Partida, 24° 31' N., 110° 23' W., 6 fathoms, sand, 21.5° C. (22.5° C., surface), April 24, skiff dredge.

STATION 107: Channel, south side of Isla Partida, 24° 31' N., 110° 23' W., 5-6 fathoms, sand, April 24, skiff dredge.

STATION 108: Second headland north of southwestern end of Isla Partida,

24° 31' 45" N., 110° 22' 30" W., 0.5–3.25 fathoms, boulders, April 26, skin diving.

STATION 109: Small cove, southeast side of San Francisco Island, 24° 48' 30" N., 110° 34' 30" W., tidal zone, sand and rocks, (25° C., surface), April 27, intertidal collecting.

STATION 110: Small cove, southeastern side of San Francisco Island, 24° 48' 30" N., 110° 34' 30" W., 1–2 fathoms, boulders and rocks, 22° C. (25° C., surface), April 27, skin diving.

STATION 111: Southwestern side of San Francisco Island, 24° 48' 30" N., 110° 34' 30" W., 0.5–4 fathoms, boulders, 22.5° C. (25° C., surface), April 27, skin diving.

STATION 112: Lagoon, inner part of Amortajada Bay, southwestern side of San José Island, 24° 53' N., 110° 35' W., 0.5–2.25 fathoms, sand, rocks, and boulders, April 28, skin diving.

STATION 113: Amortajada Bay, southwestern side of San José Island, 24° 53' N., 110° 35' W., tidal zone, sand and rocks, 26° C., April 28, intertidal collecting.

STATION 114: Amortajada Bay, southwestern side of San José Island, 24° 53' 40" N., 110° 36' 00" W., 22–25 fathoms, coarse sand, April 29, "Puritan" dredge.

STATION 115: Off Amortajada Bay, southwestern side of San José Island, 24° 54' 30" N., 110° 36' 30" W., 13.5–17.5 fathoms, coarse sand, April 29, "Puritan" dredge.

STATION 116: Off west side of San José Island, 24° 56' 00" N., 110° 14' 00" W., 36.5–40 fathoms, sand?, April 29, "Puritan" dredge.

STATION 117: Off west side of San José Island, 24° 57' 00" N., 110° 41' 20" W., 35–41.5 fathoms, sand?, April 29, "Puritan" dredge.

STATION 118: Off southeastern side of San Diego Island, 25° 11' 15" N., 110° 42' 30" W., 2–4 fathoms, boulders, April 29, skin diving.

STATION 119: Off southwestern side of San Diego Island, 25° 11' 30" N., 110° 42' 40" W., 10–15 fathoms, sand (calcareous algae), April 30, "Puritan" dredge.

STATION 120: Off southwestern side of San Diego Island, 25° 11' 30" N., 110° 42' 40" W., 25–40 fathoms, coarse sand, April 30, "Puritan" dredge.

STATION 121: Off southwestern side of San Diego Island, 25° 11' 30" N., 110° 42' 40" W., 40–50 fathoms, sand?, April 30, "Puritan" dredge.

STATION 122: Inlet between San Carlos Bay and Point San Telmo, Baja California, 25° 17' 15" N., 110° 56' 30" W., tidal zone, rocks, 22.2° C., May 1, intertidal collecting.

STATION 123: Aqua Verde Bay, Baja California, 25° 31' 30" N., 111° 04' W., 1–3.25 fathoms, rocks, 23° C. (24.5° C., surface), skin diving.

STATION 124: East of San Marcial Rock, between Point San Marcial and Aqua Verde Bay, Baja California, 25° 32' 45" N., 111° 01' 10" W., 1–3 fathoms, rocks, (24° C., surface), May 2, skin diving.

STATION 125: Cove on southwest side of Monserrate Island, 25° 40' N., 111° 03' 30" W., tidal zone, boulders, 22.2° C., May 3, intertidal collecting.

STATION 126: Off cove on southwest side of Monserrate Island, 25° 40' N., 111° 03' 30" W., 3 fathoms, coarse to medium-sized sand. (23.5° C., surface). May 3, skiff dredge.

STATION 127: Off cove on southwest side of Monserrate Island, 25° 40' N., 111° 03' 30" W., 5 fathoms, coarse to medium-sized sand, May 3, skiff dredge.

STATION 128: Off cove on southwest side of Monserrate Island, 25° 40' N., 111° 03' 30" W., 5-6 fathoms, coarse sand, 23° C. (24° C., surface), May 3, skiff dredge.

STATION 129: Off cove on southwest side of Monserrate Island, 25° 40' N., 111° 03' 30" W., 3 fathoms, coarse to fine sand, May 3, skiff dredge.

STATION 130: Southwest side of Santa Catalina Island, 25° 36' 15" N., 110° 48' 05" W., 1-2.5 fathoms, rocks, May 3, skin diving.

STATION 131: Off Salinas Bay, east side of Carmen Island, 25° 55' 15" N., 111° 10' 50" W., 41-45 fathoms, sand?, May 4, "Puritan" dredge.

STATION 132: Off Salinas Bay, east side of Carmen Island, 25° 57' 23" N., 111° 05' 50" W., 14-30 fathoms, sand (calcareous algae), May 4, "Puritan" dredge.

STATION 133: Off Salinas Bay, east side of Carmen Island, 25° 57' 40" N., 111° 06' 20" W., 20 fathoms, sand? (calcareous algae), May 4, "Puritan" dredge.

STATION 134: Off Salinas Bay, east side of Carmen Island, 25° 59' N., 111° 06' 30" W., 5-8 fathoms, coarse sand, May 4, "Puritan" dredge.

STATION 135: West side of Salinas Bay, east side of Carmen Island, 25° 59' 30" N., 111° 06' 45" W., 0.5-1 fathom, coarse sand, May 4, skin diving.

STATION 136: Lagoon, Puerto Escondido, Baja California, 25° 49' N., 111° 19' 20" W., 0-1 fathom, coarse sand and rocks, 25.5° C. in lagoon, 22.3° C. at entrance of lagoon, May 5, skin diving and intertidal collecting.

STATION 137: Puerto Escondido, Baja California, 25° 49' 45" N., 111° 19' W., surface at night light, 22.2° C., May 5, dip net.

STATION 138: Off Puerto Escondido, Baja California, 25° 48' 35" N., 111° 18' 00" W., 18-20 fathoms, fine to medium-sized sand, May 7, "Puritan" dredge.

STATION 139: Off Puerto Escondido, Baja California, 25° 49' 37" N., 111° 17' 00" W., 40-46 fathoms, fine sand, May 6, "Puritan" dredge.

STATION 140: Marquer Bay, west side of Carmen Island, 25° 52' 45" N., 111° 13' 50" W., tidal zone, sand and rocks, May 6, intertidal collecting.

STATION 141: Marquer Bay, west side of Carmen Island, 25° 52' 45" N., 111° 13' 50" W., 0.5-2 fathoms, sand and rocks, May 7, skin diving.

STATION 142: Northwest side of Danzante Island, 25° 47' 25" N., 111° 15' 45" W., beach, May 7, shore collecting.

STATION 143: Northwest side of Coronados Island, 26° 07' N., 111° 17' 50" W., tidal zone, sand and rocks, 22.9° C., May 7, intertidal collecting.

STATION 144: Off west side of Coronados Island, 26° 06' 45" N., 111° 18' 15" W., 13-16.5 fathoms, coarse sand, May 8, "Puritan" dredge.

STATION 145: Off west side of Coronados Island, 26° 07' 15" N., 111° 18' 15" W., 40-45 fathoms, coarse sand, May 8, "Puritan" dredge.

STATION 146: Southwest side of Ildefonso Island, 26° 37' 15" N., 111° 26' 35" W., sand and rock, tidal zone, May 8, intertidal collecting.

STATION 147: Off south side of Pulpito Point, Baja California, 26° 13' N., 111° 27' W., 0.5-2 fathoms, rocks, May 8, skin diving.

STATION 148: Off South Santa Inez Island, Santa Inez Islands, 27° 01' 40" N., 111° 55' 40" W., 1 fathom, boulders and rocks, May 9, skin diving.

STATION 149: South end of San Marcos Island,  $27^{\circ} 10' 15''$  N.,  $112^{\circ} 05' 30''$  W., tidal zone, rocky, May 9, intertidal and beach collecting.

STATION 150: Off south end of San Marcos Island,  $27^{\circ} 10' 15''$  N.,  $112^{\circ} 05' 30''$  W., 5–7 fathoms, coarse sand, May 10, "Puritan" dredge.

STATION 151: Off south end of San Marcos Island,  $27^{\circ} 10' 15''$  N.,  $112^{\circ} 05' 30''$  W., 10–11.5 fathoms, coarse sand, May 10, "Puritan" dredge.

STATION 152: Lobos Rock, off south end of San Marcos Island,  $27^{\circ} 09' 50''$  N.,  $112^{\circ} 05' 05''$  W., 1–3 fathoms, rocks,  $19^{\circ}$  C., May 10, skin diving.

STATION 153: San Carlos Bay, Sonora,  $27^{\circ} 56' 30''$  N.,  $111^{\circ} 05' 20''$  W., tidal zone, coarse sand and rocks,  $22.2^{\circ}$  C., May 12, intertidal collecting.

STATION 154: Ocean side, San Carlos Bay, Sonora,  $27^{\circ} 56' 25''$  N.,  $111^{\circ} 05' 25''$  W., tidal zone, boulders,  $22.2^{\circ}$  C., May 12, intertidal collecting.

STATION 155: Ocean side of San Carlos Bay, Sonora,  $27^{\circ} 55' 35''$  N.,  $111^{\circ} 05' 15''$  W., 1–2.5 fathoms, sand and rocks, May 12, skin diving.

STATION 156: San Pedro Bay, Sonora,  $28^{\circ} 03' 20''$  N.,  $111^{\circ} 16'$  W., sand and cobbles, beach, May 14, shore collecting.

STATION 157: Southeast side of Red Bluff, south end of Tiburón Island,  $28^{\circ} 45' 10''$  N.,  $112^{\circ} 20' 36''$  W., tidal zone, sand, gravel, and pebbles,  $18.8^{\circ}$  C. ( $19.4^{\circ}$  C., surface), May 16, intertidal collecting.

STATION 158: Between Red Bluff Point and Monument Point, south end of Tiburón Island,  $28^{\circ} 45'$  N.,  $112^{\circ} 21' 15''$  W., 1–3 fathoms, rocks, May 16, skin diving.

STATION 159: Off Red Bluff, south end of Tiburón Island,  $28^{\circ} 45'$  N.,  $112^{\circ} 22'$  W., 10 fathoms, coarse sand, May 18, "Puritan" dredge.

STATION 160: Off Red Bluff, south side of Tiburón Island,  $28^{\circ} 45' 30''$  N.,  $112^{\circ} 23' 15''$  W., 20–22 fathoms, coarse sand, May 18, "Puritan" dredge.

STATION 161: Off Red Bluff, south side of Tiburón Island,  $28^{\circ} 45' 30''$  N.,  $112^{\circ} 24' 00''$  W., 30–32 fathoms, coarse sand, May 18, "Puritan" dredge.

STATION 162: Off Red Bluff, south side of Tiburón Island,  $28^{\circ} 45' 30''$  N.,  $112^{\circ} 24' 00''$  W., 40 fathoms, bryozoan-sand, May 18, "Puritan" dredge.

STATION 163: Off south end of Tiburón Island,  $28^{\circ} 44' 00''$  N.,  $112^{\circ} 25' 00''$  W., 50 fathoms, sand?, May 18, "Puritan" dredge.

STATION 164: Southeastern end of San Esteban Island,  $28^{\circ} 41' 15''$  N.,  $112^{\circ} 34'$  W., 0–3.25 fathoms, cobbles,  $16.6^{\circ}$  C., May 18, skin diving and intertidal collecting.

STATION 165: West side of South San Lorenzo Island,  $28^{\circ} 35' 45''$  N.,  $112^{\circ} 50''$  W., 1–3.25 fathoms, rocks,  $16.6^{\circ}$  C., May 19, skin diving.

STATION 166: West side of South San Lorenzo Island,  $28^{\circ} 35' 45''$  N.,  $112^{\circ} 50'$  W., cobble beach, May 19, shore collecting.

STATION 167: Off southeast end of Angel de la Guarda Island,  $29^{\circ} 01' 00''$  N.,  $113^{\circ} 07' 00''$  W., 15–17 fathoms, sand?, May 20, "Puritan" dredge.

STATION 168: Off southeast end of Angel de la Guarda Island,  $29^{\circ} 01' 30''$  N.,  $113^{\circ} 07' 20''$  W., 16–17 fathoms, sand?, May 20, "Puritan" dredge.

STATION 169: Southeast side of Angel de la Guarda Island, near Pond Island,  $29^{\circ} 01' 30''$  N.,  $113^{\circ} 08'$  W., cobble beach,  $16.6^{\circ}$  C., May 20, intertidal and shore collecting.

STATION 170: Southeast side of Angel de la Guarda Island, "reef" south of Pond Island,  $29^{\circ} 02'$  N.,  $113^{\circ} 07' 30''$  W., 1–3.25 fathoms, rocks, May 20, skin diving.



STATION 171: Mejia Island, off north end of Angel de la Guarda Island, 29° 33' N., 113° 35' W., cobble beach, May 21, shore collecting.

STATION 172: Puerto Refugio, north end of Angel de la Guarda Island, 29° 32' 45" N., 113° 33' 20" W., 16–18 fathoms, mud and fine sand, (19.5° C. surface), May 22, "Puritan" dredge.

STATION 173: Puerto Refugio, north end of Angel de la Guarda Island, 29° 33' N., 113° 34' 30" W., 17–19 fathoms, coarse sand, 19.5° C., May 22, "Puritan" dredge.

STATION 174: Puerto Refugio, north end of Angel de la Guarda Island, 29° 33' N., 113° 34' W., beach, May 22, shore collecting.

STATION 175: Gonzaga Bay, Baja California, 29° 45' 50" N., 114° 21' W., 1–3.25 fathoms, sand and rocks, 20.5° C., May 22, skin diving.

STATION 176: Gonzaga Bay, Baja California, 29° 45' 50" N., 114° 21' W., beach, coarse sand, May 22, shore collecting.

STATION 177: Gonzaga Bay, Baja California, 29° 46' 00" N., 114° 21' 00" W., 10 fathoms, fine sand, May 23, "Puritan" dredge.

STATION 178: Gonzaga Bay, Baja California, 29° 47' 25" N., 114° 21' 00" W., 20 fathoms, clay-like mud, May 23, "Puritan" dredge.

STATION 179: Off San Luis Island, 29° 56' 00" N., 114° 23' 30" W., 28 fathoms, coarse sand and pebbles, May 23, "Puritan" dredge.

STATION 180: Off San Luis Island, 29° 56' 30" N., 114° 25' 00" W., 7–10 fathoms, coarse sand, May 23, "Puritan" dredge.

STATION 181: South side of San Luis Island, 29° 57' 20" N., 114° 25' W., beach, May 23, beach collecting.

STATION 182: About 17 miles southwest of Consag Rock, 30° 48' N., 114° 30' 00" W., 17 fathoms, fine clay-like mud, May 24, "Puritan" dredge.

STATION 183: About 14 miles southwest of Consag Rock, 30° 54' 30" N., 114° 42' 00" W., 16 fathoms, fine clay-like mud, May 24, "Puritan" dredge.

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