

Waldo L. Schmitt -- 1925-1927

August 12 - Sept. 8, 1925; Rio de Janeiro and vicinity.

- No. 1. Ilha Paqueta, Aug. 17; littoral.
2. Niotheroy, Aug. 22; "
3. Ilha Paqueta, Aug. 23; "
4. Pedra da Itapua, Niotheroy, Aug. 24; littoral.
5. São Francisco, well beyond Niotheroy on bay, Aug. 25.
6. Conto do Rio, Niotheroy, Aug. 26; littoral.
7. Ilha Governador, Aug. 27; up river.
8. Off Ilha Governador, Aug. 29; oyster dredge, depth 6 meters. 3 fm.
9. Off Ilha Paqueta, Aug. 29; boat dredge, depth 6 meters.
10. Off Ilha Paqueta, Aug. 29; " " " 4 "
11. Off Ilha Paqueta, Aug. 29; boat dredge.
12. Ilha Governador, Sept. 1; tide flats.

Sept. 9 - September 16, 1925; at Santos, Brazil

- No. 13. Ponta da Rio, opposite ferry, Santos estuary, Sept. 12; littoral.
14. Collected on muddy, sandy beaches between canals No. 4 and No. 6, Santos estuary, Sept. 13.

Sept. 18 - 26, 1925, at Villa Bella, Ilha São Sebastião, Brazil

- No. 15. South of Villa Bella, Sept. 19; littoral.
16. Stony beach, south of hotel, Sept. 20.
17. " " " " " Sept. 21.
- 17a. Tow-net haul in front of hotel between 7 and 7:30 p.m. (No. 6 net), Sept. 21.
- 17b. Bobbinet dip-net dragged on bottom for Amphioxus in front of hotel between 7 and 7:30 p.m., Sept. 21.
- 17c. Tow-net haul in front of hotel, 9:45 p.m. (No. 6 net), Sept. 21.

- No. 18. Fresh-water stream, Rio Taguanduba, south of town. Sept. 22.  
 19. " " " " " " " " 23.  
 20. In front of hotel, Sept. 23.  
 21. As No. 18 and 19, Sept. 23.  
 22. As No. 18, 19, 21, Sept. 23.  
 22 "B" Tow-net haul in front of hotel, 9 p.m., surface, tow over 3 ft. of water, Sept. 23.  
 22 "C" As No. 22 "B". 11 p.m.  
 22 "C" " " " " 1 a.m.

October 2-3, 1925, at Paranaguá, Paraná, Brazil

- No. 23. Tide flat collections, Oct. 2.  
 24. " " " " Oct. 3.

October 4-10; São Francisco do Sul, Santa Catharina, Brazil, and vicinity.

- No. 25. Praia Enseada, Oct. 4, littoral.  
 26. Fresh-water stream, at Ribeirão de Bananal, Oct. 5.  
 27. Ponta da Cruz, Oct. 7, littoral.  
 28. North end of Praia Enseada, Oct. 8.  
 29. Fresh-water stream at Ribeirão de Bananal  
 30. Praia Utatuba in drainage ditches, Oct. 8.

October 10 - 15, 1925; Rio Negro, Paraná, Brazil, and vicinity

- No. 31. Along banks of Rio Negro, above railway bridge, Oct. 10.  
 32. Along banks of Rio Negro, on Mafra side, above railway bridge, Oct. 11.  
 33. Fish pot in river, Oct. 12.  
 34. Drainage ditches, Oct. 12.  
 35. Fish pot in river, Oct. 13.  
 36. Cast net collection, 7 - 8 p.m., in rapids above railway bridge, Oct. 14.

No. 37. Fish pot in river, Oct. 15.

38. " " " " " 16.

October 17 - 20, 1925, Castro, Parana, Brazil, and vicinity

No. 39. Rio Iapo, near railway bridge, Oct. 17.

40. At Hacienda Marumby, day's trip from Castro up Rio Iapo, Oct. 18.

41. Rio Iapo, above Instituto Christao - Oct. 19.

42. Rio Iapo, near railway bridge, Oct. 20.

October 21 and 22, 1925. Rio Negro, Parana, Brazil

No. 43. Along river, Oct. 21.

44. Fish pot, Oct. 22.

October 28 - 31, 1925; São Francisco, Santa Catharina, Brazil & vicinity

No. 45. Ponta da Cruz, Oct. 28, littoral.

46. " " " " 29.

46B. " " " " 29.

47. " " " " 29.

48. Drainage ditches along railway right of way. Oct. 31.

November 4-6; Florianopolis, Santa Catharina, Brazil

No. 49. North end Praia da Fora, Nov. 5, littoral.

November 1 - Dec. 10, 1925; Montevideo, Uruguay and vicinity

No. 50. Artificial lake in Prado, Nov. 12.

51. With steam trawler, 6 miles E. of Isla de Flores, Rio de la Plata, Nov. 13, otter trawl, 7 fms., mud.

52. With steam trawler, 7 miles E.N.E. of Isla de Flores, Rio de la Plata, Nov. 13, otter trawl, 7-1/2 fms., mud.

53. With steam trawler, 5 miles N.E. of Isla de Flores, Rio de la Plata, Nov. 13, otter trawl, 7-1/2 fms., mud.

54. With steam trawler, 4 miles E. of Isla de Flores, Rio de la Plata, otter trawl, 6 fms., mud.

- No. 55. 5 miles S. of Isla Flores, otter trawl, mud.
56. Punta del Este, Nov. 15, littoral.
57. Otter trawl, off Isla Flores, Nov. 16, 2 hauls.
58. 13 miles S.E. of Ponton Faro, Banco Ingles, Nov. 18, otter trawl,  
7-1/2 fms., mud.
59. 10 miles S. of Ponton Faro, Banco Ingles, Nov. 18, otter trawl, 7 fms.
60. 15 miles " " " " " " " " " " 8 " mud
61. " S. " " " " " " " " " 8-1/2 "
62. Punta Carteta, Nov. 21, littoral.
63. 4 miles S. of Isla de Flores, Nov. 24, otter trawl, 7 fms., mud.
64. 5 miles N.E. of Isla de Flores, " " " " " " " "
65. At Barro de Santa Lucia, Nov. 25, tide flats by boat house.
66. Ditto. Shore collection down stream.
67. Ditto. Four boat dredge hauls, 3-4 meters; mud.
68. Banco Arquimedes, Nov. 26, otter trawl, 7 fms., mud.
69. " " " 28 " " 7-1/2 fms.
70. " " " 28 " " " "
71. Small stream tributary to Arroyo Miguelete, in Prado, Dec. 1.

December 4 and 5, 1925; en route to Puerto La Paloma, Uruguay

- No. 72. River at San Carlos, Dec. 4, tow-net.
73. Crabs caught on baited fish line, river at San Carlos, Dec. 5.
74. Rocha, at hotel, Dec. 5.

December 6 - 8, 1925; at Puerto La Paloma, Uruguay

- No. 75. Between hotel and lighthouse, Dec. 6, littoral.
76. Townet haul from pier near hotel, Dec. 6, 9 p.m.
77. Townet haul in surf on beach in front of hotel, Dec. 6, 9:45 p.m.
78. Far side of bay, before hotel, Dec. 7, littoral.
79. West of lighthouse, Dec. 7, littoral.

December 9 - 13, 1925; Montevideo, Uruguay and vicinity

No. 80. Grayfishes from General Bazzano's place, just outside of Montevideo,  
Dec. 10.

81. Carrasco Creek, Dec. 11.

December 15-20, 1925; Buenos Aires, Argentina & vicinity

No. 82. Isla Flores, Tigre, Buenos Aires, Dec. 25.

August 29, 1926; made a few beach collections at Talara, Peru

Sept. 5-11, 1926; Guayaquil, Ecuador, and vicinity, obtained  
some specimens from the market.

Sept. 12-13, 1926; at Salinas and Punta Santa Elena, Ecuador.

No. 1. Salinas, Sept. 12, littoral.

2. " " 13.

3. " " 14.

5a. " " 14, on beach.

4. " " 14, lobsters from fisherman, and crabs from beach.

5. Punta Santa Elena, Sept. 15, littoral.

5a. Salinas, Sept. 16, from fisherman.

6. Salinas, Sept. 17, from beach.

7. Punta Santa Elena, Sept. 17, tide pools.

Sept. 20 - Oct. 3, 1926; Guayaquil, Ecuador, and vicinity,  
including visits to market.

No. 8. Tide flats at Salada, Guayaquil, Oct. 1 and 2.

Oct. 4 - 14, 1926; Paita, Peru and vicinity

No. 9. First point of rocks north of railway station, Oct. 6.

10. Off coast just north of Paita, Oct. 7, dredging with boat dredge.

11. Do. Oct. 8.

12. South of Paita, Oct. 9, littoral.

No. 13. From fishermen, Oct. 14.

October 17-25, 1926; Salaverry, Peru and vicinity

No. 14. Along shore, Oct. 15.

15. South of pier, Oct. 19, littoral.

16. Rio Moche, freshwater, at railway bridge, Oct. 20.

17. On wreckage, off beach, north of pier, Oct. 21.

18. Do. Oct. 22.

19. Rio Moche, freshwater, at railway bridge, Oct. 23.

20. From wreckage pulled up on pier, Oct. 23, 24.

October 26 - November 10, 1926; at Callao, Peru & vicinity

No. 21. Herradura, Oct. 31, littoral.

22. San Lorenzo Id., Callao Bay, Nov. 1, littoral.

23. Do. Nov. 3, littoral.

24. Off passage between San Lorenzo and adjacent island, Callao Bay  
(off 3 arch rocks), Nov. 7, dredging with scallop trawl.

November 10-18, 1926; en route Valparaiso, Chile.

No. 24a. Few shrimps bought in market at Arica, Chile, Nov. 13.

25. Tocopilla, Chile, Nov. 14, littoral.

26. Antofagasta, Chile, Nov. 15, littoral.

27. Chanaral, Chile, Nov. 16, littoral.

November 19-23, 1926; at Museo Nacional, Santiago, Chile

November 24-26, 1926; Valparaiso awaiting schooner for  
Juan Fernandez.

November 27 - Dec. 7, 1926; en route Juan Fernandez.

No. 28. Townet haul, 8:10 - 8:20 p.m., No. 12 net, Nov. 29.

28a. Scrapings from row boat hoisted on deck, Nov. 29.

29. Townet hauls, 6:30 - 7:15 a.m., No. 12 net, Nov. 30.

- No. 30. Trawl hauls, 9:30 - 9:50 p.m., No. 12 net, Dec. 5.  
 31. Do. 5:30 - 5:40 a.m., Dec. 5.  
 32. Do. Between 11 a.m. and 3 p.m., Dec. 6.  
 33. Do. 10:20 - 10:30 p.m., Dec. 6.

December 8 - 27, 1936; on Juan Fernandez

- No. 34. Along boulder covered beach to left of cannery, Dec. 8, littoral.  
 35. Along eastern shore of Cumberland Bay, Dec. 8, littoral.  
 36. East of cannery, Dec. 9, littoral.  
 37. Dredging with boat dredge, Cumberland Bay, Dec. 10.  
 38. As far as last impassable point, to east of Cumberland Bay,  
 Dec. 11, littoral.  
 39. Blank in notebook.  
 40. Terrestrial amphipods, etc. from garden of Gen. Charpentier, Dec. 13.  
 40a. More of same, on way home, Dec. 13.  
 41. On slopes of hills, on way to Melkirk's Lookout.  
 41a. Ditto.  
 42. From fisherman, from Santa Clara Bay, taken Dec. 12, in lobster  
 nets, 25 fm.  
 43. From fisherman, from Bahía del Padre, Dec. 13, in lobster net, 30 fm.  
 44. Ditto, from Ancla (Vaquería), Dec. 13, in lobster net, 18 fm.  
 45. Ditto, from Severina, Dec. 13, in lobster net, 18 fm.  
 46. Dredging with boat dredge in Bahía del Padre, Dec. 15.  
 47. Ditto, in Carbajal Bay, Dec. 14, 18-20 fm.  
 48. North Bay of Santa Clara Id., Dec. 15, littoral.  
 49. Trawl haul, No. 12 net, Dec. 16, 9-9:30 p.m., out through entrance  
 to Bahía del Padre.  
 50. Ditto, Dec. 16, 3:30-4 a.m.  
 51. Jellyfish and growth-covered rocks from fisherman, Dec. 17.  
 52. From fisherman, from off Santa Clara Id., taken Dec. 17.

- No. 53. Another jellyfish, taken Dec. 17, color noted.
54. Growth-covered rocks, from fisherman, Dec. 17.
55. Boat dredge in Cumberland Bay, 10-20 fm., Dec. 17, 3:30-4:30 p.m.
56. Seine hauls, on beach east of cannery, Dec. 19, 1926.
57. Along shore, east of cannery, Dec. 20, littoral.
58. Seining as in No. 56, Dec. 20.
59. East of cannery, Dec. 22, littoral.
60. Freshwater streams, beyond Charpentier's place, Dec. 22.
61. Shrimps from live cars, Cumberland Bay, Dec. 26.
62. Water samples enroute, return, Dec. 29.

January 1 - Jan. 3, 1927; Valparaiso, Chile & vicinity

- No. 63. At Torpederas, Jan. 6, littoral.

January 9 - 11, 1927; Santiago, Chile

January 12 - 14, 1927; Concepcion, Chile

- No. 64. In freshwater streams, Jan. 13.
65. Crayfish dug out of ground in hills, south of Calle Alemana, Jan. 14.

January 15, 1927; at Talcahuano, Chile

- No. 66. Collected on islet off pier, Jan. 15.

West coast. Jan. 16-26, 1927; en route <sup>from</sup> Talcahuano, ~~Peru~~  
to Punta Arenas, Chile.

- No. 67. At Lota, Jan. 16, littoral.
68. At Corral, bottom sample, and shore collecting, Jan. 20.
69. At Castro, island of Chiloe, bottom sample, Jan. 22.



Jan. 27 - Feb. 13, 1927; Punta Arenas, Chile, and vicinity

No. 70. Tide flats east of town, Jan. 30.

71. Tide flats, Jan. 31.

72. On beach at fishing camp, west of town, Feb. 1.

73. Rocky shore, west of town, Feb. 3.

74. Ditto, Feb. 2, afternoon.

75. Along beach, low tide, Feb. 3.

76. From fishermen's hauls, sentolla net, Feb. 4.

77. Evening on tide flats, Feb. 4.

78. Got some material from large trawl net on dock, Feb. 5.

Feb. 18 - March 1, 1927; Port Stanley, Falklands & vicinity

No. 79. Along seawall, east of mail jetty, Feb. 22.

80. Boat dredging, above Battle Monument, Feb. 23, mud bottom.

81. Ditto, Feb. 23, through kelp.

82. Water sample, Feb. 28.

83. Electric light, off Falkland Island Co.'s east jetty, Feb. 28.

84. West of Governor's landing, March 1, littoral.

March 2-13, 1927; on board "Fleurus" enroute Deception Island and return.

No. 85. Bottom sample, Choiseul Sound, below Port Darwin, East Falkland, Mar. 2.

86. Townet haul along pier, at 12 midnight, Port Howard, West Falkland, Mar. 3.

87. Bottom sample, Port Howard, 4 fms., March 4.

88. Dips with tow-net, No. 12 net, 12:30-1:30 a.m., Mar. 5, night before reaching Deception Island.

89. From anchor, Port Forster, Deception Island, 60 fms., Mar. 10.

90. Tow-net haul through "narrows" entering Stanley Harbor, No. 12 net, March 13, 9 p.m.

## March 14 - April 23, 1927; Port Stanley, Falklands

- No. 90a. Seine haul in lower bay, March 14.
- 90b. Trawl hauls, No. 12 net, from Municipal Jetty to that of Harbor-Master, Mar. 15.
91. Examined lot of "mullet" heads and stomachs, Mar. 15.
92. South of Municipal Jetty, to off cemetery, Mar. 16, littoral.
93. Boat dredging, off coal dock, far side of harbor, Mar. 17, 1-2 fm.
94. Fresh-water pools, back of Globe Hotel, Mar. 18.
95. Bottom sampler dips, after passing "narrows" into Port William, Mar. 20.
96. Tow-net hauls, ditto, 9-10 a.m., No. 13 net, March 20, Port William.
97. Half dozen drags, with oyster dredge, March 20, 8-10 fms. Port William.
- 97a. Fish from kelp roots, pulled up at Harbor-Master's Jetty, Mar. 20.
- 97b. From York Bay, Mar. 20, littoral.
98. From kelp roots on beach at Rattle Monument, Mar. 27.
99. From Off Kidney Island, taken Mar. 26, by Jack Davis.
100. From anchor at Harbor Master's Jetty, Mar. 26.

## March 31 - Apr. 5, 1927; At Douglas Station and Teal Inlet, East Falkland

- No. 101a. Sheep ticks, from Greenshield's at Douglas Station, Mar. 31.
- 101b. Amphipods from beach near sheep dip, " " Apr. 1.
102. Teal Inlet, beach collections, first inlet west of house, Apr. 2.
- 102b. Lice from Upland geese, shot April 2.
103. Trout and stomach contents, from trout stream, Teal Inlet, Apr. 3.
104. Fresh-water streams, amphipods and leeches, Apr. 4.

Apr. 6 - 28, 1927; Port Stanley, Falklands and vicinity

- No. 106. Oyster dredge off lighthouse, north side of Fort William, Apr. 9,  
14-15 fm.
106. Taken off Municipal Jetty, Apr. 11.
- 106a. From off Malvina House, Apr. 10.
- 106b. Ditto, Apr. 11.
- 106c. From off Municipal Jetty, April 13.
107. Taken with clam rake from under side of "Great Britain," Apr. 14,  
1 fm. to surface.
108. Received from school children at Teal Inlet, Apr. 11.
109. Near Wireless Station, at head of bay, west end, April 15; littoral,  
and seine collections.
110. From along shore near Municipal Jetty, Apr. 16.
111. Bottom sample off Jetty, April 15.
112. Fresh-water pools back of Government House, April 17.
113. Mullet Creek, beach and seine collections, Apr. 18.
114. Near Penguin rookery at Sparrow Cove, Apr. 20.
115. Oyster dredge, outside, between Pembroke Lighthouse and Tussock  
Id., April 22, 10-15-15 fm.
116. Tow-net haul, same day, and place.
117. York Point, Port William, Apr. 24, littoral.
118. Dredging in Whale Sound, lower bay, April 26, 2--2-1/2 fm., from  
wireless pier through "narrows".

May 1 and 2, 1927; Punta Arenas, Chile

- No. 119. Live frog from Chalros Hamann, taken at Estancia "Laguna del Oro",  
Pueblo Ness, Territory de Santa Cruz, Argentina.

May 3-12, 1927; En route Punta Arenas, Chile to  
Buenos Aires, Argentina

- No. 120. Rio Gallegos, Argentina, May. 4.
121. Santa Cruz, Argentina, May 5.
122. Ditto.

No. 123. San Julian, Argentina, May 6.

124. Puerto Deseado, Argentina, May 7.

125. Comodoro Rivadavia, Argentina, May 8.

126. Puerto Madryn, May 9.

May 16-19, 1927; Montevideo, Uruguay & vicinity

No. 127. Land and fresh-water collections at Carrasco, May 18.

2821  
1927

(From "Explorations and Field-Work of the  
Smithsonian Institution in 1927")

## THE CRUSTACEANS OF SOUTH AMERICA

By WALDO L. SCHMITT,

*Curator, Division of Marine Invertebrates, U. S. National Museum*

The conclusion of last year's account of my study of the crustacean fauna of South America under the Walter Rathbone Bacon Travelling Scholarship<sup>1</sup> left me on my way by steamer to that "Vale of Paradise," Valparaiso, Chile, which I reached November 18, 1926. During stops en route to discharge and take on cargo—stops often of some hours duration—intertidal collections were made at Tocopilla, Antofagasta, Chañaral, and Cruz Grande, Chile. Valparaiso I should call the San Francisco of South America in almost every respect, the business-like atmosphere, the hills, the narrow streets of the older town, and the stimulating "California" climate, all recalling the American city.

Through the kindness of Señor Doniez, part owner of the spiny-lobster fishing concession on the Island of Juan Fernandez, I had the good fortune to be furnished passage to that historic place, the one-time home of Alexander Selkirk, the hero of Robinson Crusoe. The spiny-lobster or crawfish fishery of Juan Fernandez is one of the largest of its kind and the total catch of over 87,000 individuals as given in the Chilean fishery statistics for 1925 for the two companies operating in those waters exceeds in number of pounds the combined catches made in California and Florida, where related species are taken for the market.

The extremely generous hospitality of Señor René Durand and his family rendered most pleasant and profitable a sojourn of 20 delightful December days in this veritable earthly paradise. Few places are blessed with such an ideal, healthful and fruitful climate. Preliminary studies on some of the zoological collections I brought back with me have disclosed a distinct species of New Zealand crab new to this fauna, and a spider of a genus known from South Africa, Australia, and New Zealand, and now found here, the first record for the Western hemisphere. The zoological evidence of the Polynesian and subantarctic affinities of the life of Juan Fernandez has never been as strong as that based on botanical data, and these two finds are therefore rendered all the more significant.

<sup>1</sup> Smithsonian Misc. Coll., Vol. 78, No. 7, p. 89, 1927.

It is a pleasure to acknowledge the cordial reception accorded me at the National Museum of Chile in Santiago by Dr. Eduardo Moore, the Director of that Institution; Dr. Juan Brüggen of the University of Chile; and Dr. Carlos E. Porter, the indefatigable Chilean zoologist. Dr. Porter is to be highly commended for his personal financial support of the *Revista Chilena Historia Natural*, the only periodical of its kind published in Chile.

In Santiago I visited Dr. Ernesto Maldonado, Director of the Chilean Forest, Fish and Game Commission, as well as the very excellent small museum maintained by this department. In consultation with Dr. Maldonado and Dr. Augusto Opazo of the Fisheries Service, plans were outlined by which the Smithsonian Institution would undertake to prepare a report on the crustacea of the coasts of Chile, based upon material to be collected and shipped to Washington for the purpose. To the American Ambassador to Chile, Mr. Collier, are due thanks for his kindness in lending a member of his staff to this preliminary discussion.

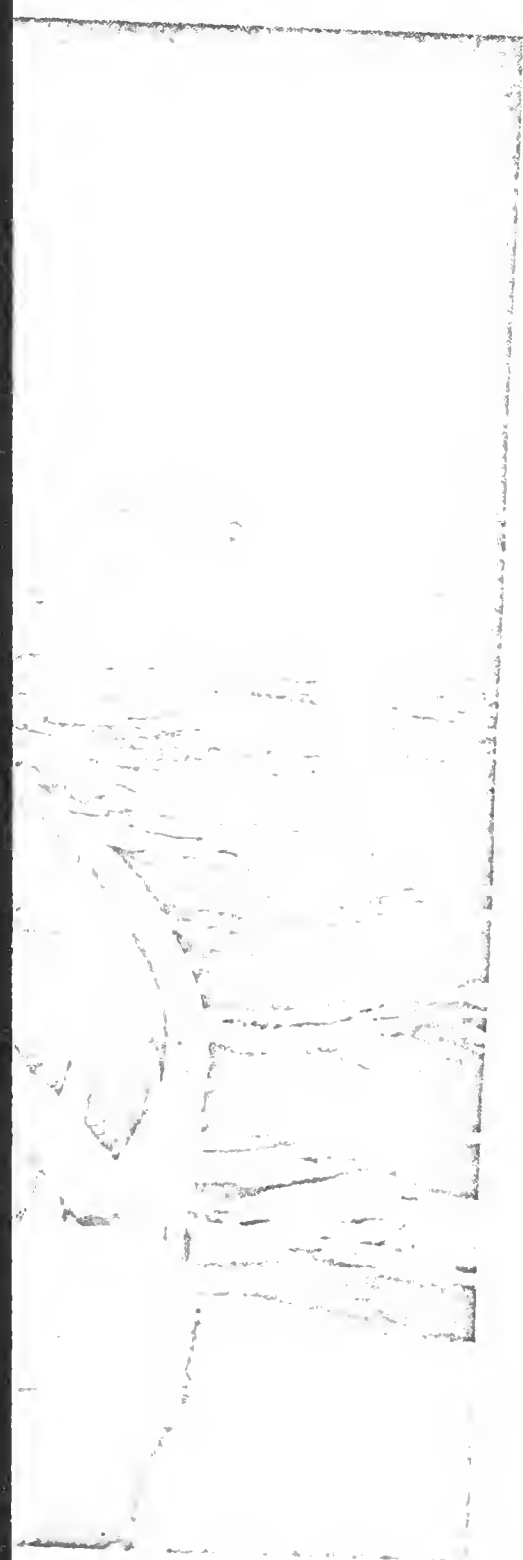
The Museum of the University of Concepcion, although small, is growing and covers a wide range of activities. It is the best museum of its kind that it was my pleasure to visit on the west coast of South America. That it is an institution of great promise is due almost entirely to the energy and enthusiasm of its Director, Dr. Carlos Oliver Schneider.

From Talcahuano, Castro on the Island of Chiloe was reached five days later, after short stops en route, permitting some shore collecting at Lota, and at Corral. Southward through Chonos Archipelago and the canals of southern Chile to the Straits of Magellan, the scenery in many respects compares favorably with that of the Inland Passage to Alaska. This vast stretch of coast from Castro south, over 1,000 miles in a straight line, is still a "terra incognita," with little more known of its resources and scientific potentialities than when Darwin first visited the region 84 years ago. Collections of animals were made at Punta Arenas, Chile, before visiting the Falkland Islands. In Punta Arenas is a wonderful little museum maintained by the Salesian Brotherhood. It is a treasure house of things and rarities Fuegian, and is well worth a visit by ethnologists interested in this fast disappearing race of Indians.

Port Stanley, Falklands, was reached after what I considered a rather tempestuous passage, during which the galley of the small schooner in which the journey was made was flooded, the potatoes and other vegetables washed over-board, and the motor-room hatch



ené Durand, Juan Fer-  
hospitably entertained  
at romantic island.



rs" aboard schooner  
market. As many  
ve to the mainland

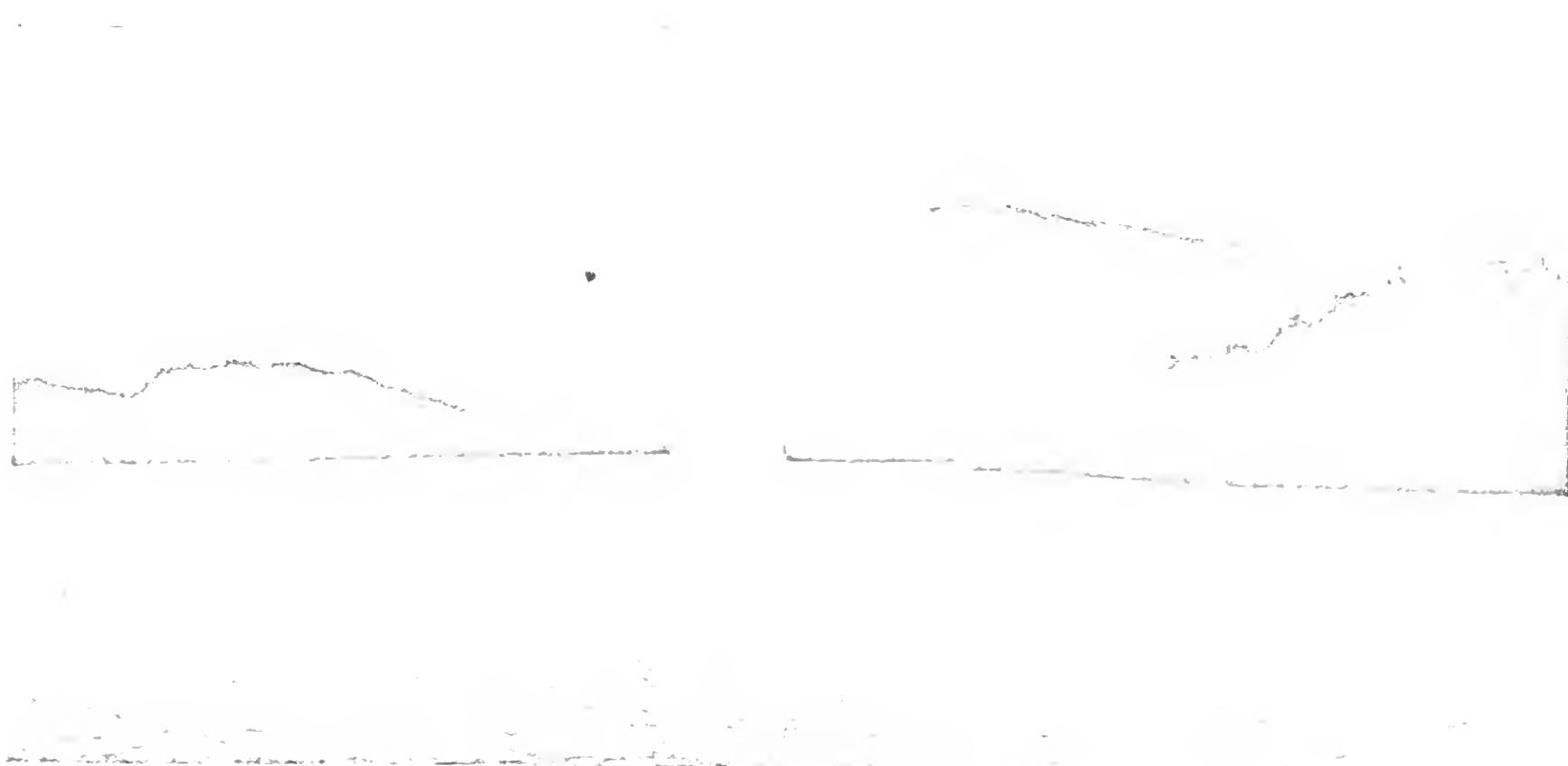


FIG. 46.—English Narrows, Territory of Magallanes, Chile. The scenery in many respects is comparable to that of the Inland Passage of Alaska.

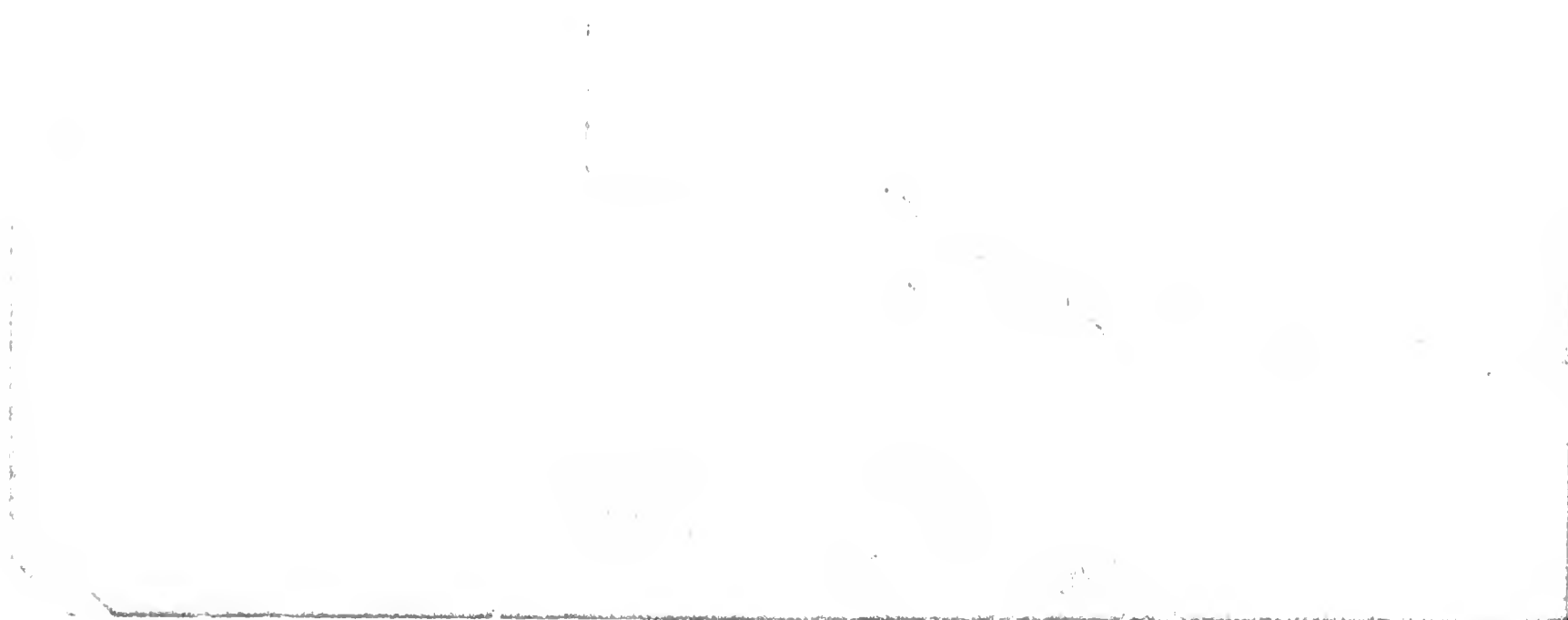


FIG. 47.—Teal Inlet, East Falklands. A treeless country given over to sheep grazing. Many interesting specimens of marine life were taken from the holdfasts of the kelp that is dragged ashore here, as fertilizer for the adjacent fields.

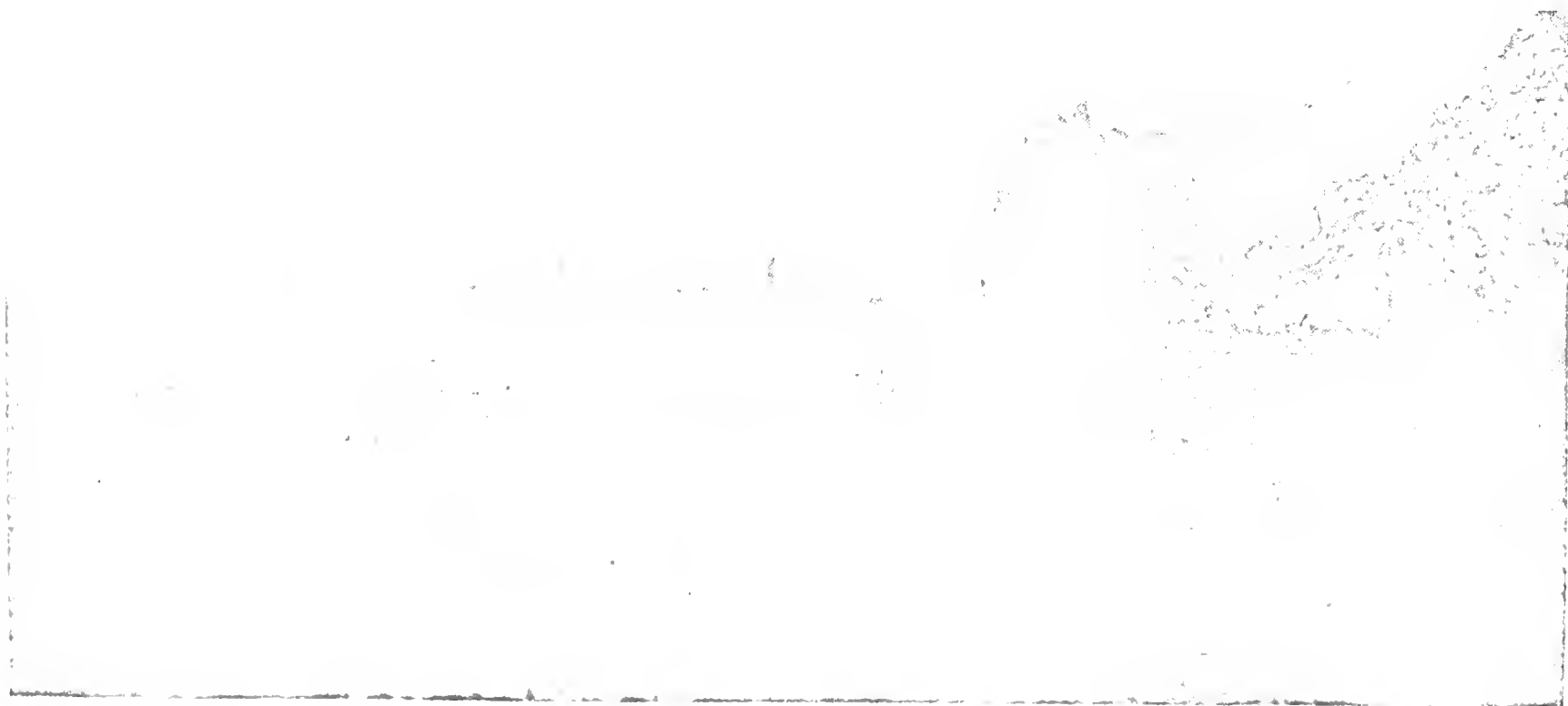


FIG. 48.—Port Forster, Deception Island, South Shetlands. Part of a fleet of eleven floating whale factories that made this harbor their rendezvous during the 1927 whaling season. The numerous birds in the foreground are a species of petrel, *Daption capense* (Linnaeus), commonly called "Cape Pigeon," feeding on whale offal.

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FIG. 49.—The land

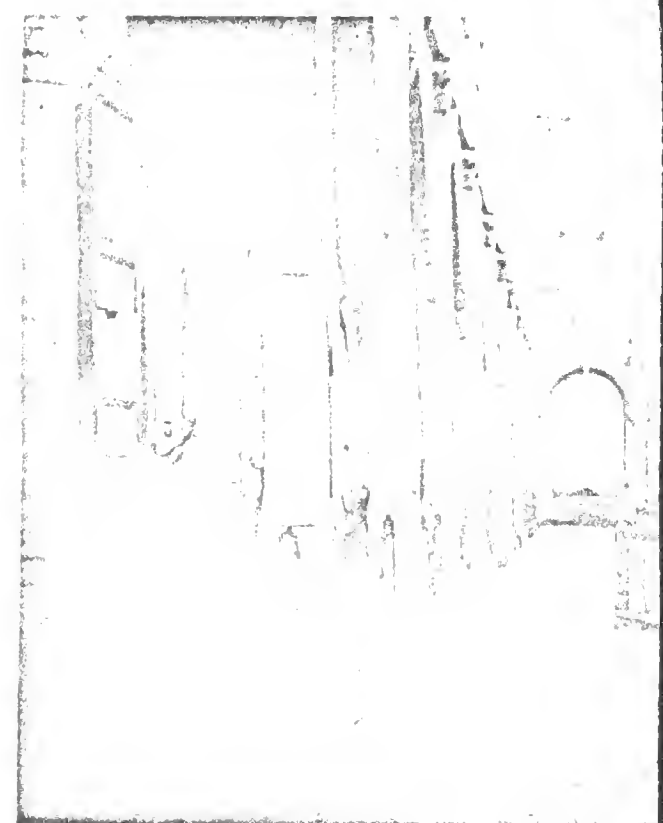


FIG. 50.—The main



FIG. 51.—Museo Salesiano small museum is particularly Indians.

stove in—all this in the course of what the Captain called fairly good weather! The Falklands are well-known in scientific annals chiefly through the visitations of Darwin and of the "Challenger," and through the collections of Mr. Rupert Vallentin. Most helpful assistance was extended me during more than a month's stay (February to April, 1927) on East Falkland by the Governor, the Colonial officials, and all the private citizens with whom I came in contact. The interest of the school boys of Stanley caused them to bring in a number of specimens which might otherwise not have been obtained; and a brief talk to a class of pupils at Teal Inlet resulted in establishing a new record of the occurrence of one of the rarer shrimps (*Campylonotus vagans* Bate), heretofore known from the Straits of Magellan, Cape Horn and South Georgia, taken by Miss Eileen Felton from the roots of kelp hauled from water about two fathoms in depth for the purpose of fertilizing the fields.

Taking advantage of an opportunity offered while in the Falklands, a trip was made via the once-yearly mail boat to Deception Island of the South Shetlands, the headquarters of the whaling industry of that region. On the way, several tow-net hauls yielded a number of organisms new to the National Museum collections.

In the course of my return journey to the States, beginning April 28 in the Falkland Islands, collections were made at several ports in Argentine Patagonia: Rio Gallegos, Santa Cruz, San Julian, Deseada, Comodoro Rivadavia, and Puerto Madryn. At Buenos Aires, through the continuing kindness of Dr. Doello-Jurado, Director of the Argentine National Museum, a loan of further study collections of crustacea was obtained. At São Paulo, Brazil, the Museo Paulista, from which we have had most helpful cooperation for a great many years, was revisited during the two days that the northward bound steamer was taking its cargo of coffee on board at Santos. I arrived in New York on June 7, reaching Washington two days later.

The most grateful acknowledgment is due to the memory of Mrs. Virginia Purdy Bacon and her son, Walter Rathbone Bacon, in whose honor she founded the travelling scholarship which made possible this general reconnaissance of the marine fauna of the greater part of the coasts of South America, resulting in more than 15,000 specimens, and many valuable notes and observations. A great deal of this material is new to the National Museum's collections, including many additional records of occurrence and distribution, and, as far as the limited preliminary studies have indicated, a number of species new to science.



1  
WALDO L. SCHMITT

Bacon Scholarship

Aug-Dec. 1925 pp. 1-47

Aug. 1926 - May 1927 pp. 48-108

Sta. #1.

Wed., Aug. 19, 1925. Ilha Paqueta, Bay of Rio de Janeiro. 9.00 a.m. - 2.00 p.m. Tide beginning to flood, tidal flats. Shore collecting. Rocky, sand beaches intervening, rocks fairly large, smaller ones in one or two places. This applies to most of Island, on west side, going round to north was mud flat, only place where Hepatus and Crangon were found.

Lydgia common everywhere but hard to catch. Xanthids everywhere, two little Galathea-like critters from soft bluish star, the large slender rayed one. Amphipods washed from sea weeds collected around island, one or two bunches picked up on beach.

Callinectes from N.E. section north of Brown's place on warm sandy flats, shallow between boulders and along seaweed. One small Portunid, yellow brown, from mud flats. (Callinectes ornatus, juv.--Note by M.J.R.)

Sta. #2 Nictheroy

Sat., Aug. 22, 1925. 9:15 - 10:30 a.m., low tide. In pool foot wide, 18 inch deep, 3 feet long. Temp. of botton  $23^{\circ}$ C. Sand beach between rocks. A boy watching me pulled an Eriphia gonagra claw from rock crevice, same one in which pool was, but he failed to get crab.

Everything saved, but small representation of life on rocks by Conto de Rio. Didn't have time to collect more.

Small fishes from the Rio, a little stream running through sand ? but probably only brackish water slough cut off at low tide; didn't seem to have any current, but I'll have to go back to look at it.

Crab came from little pool between two large rocks, as did most of other stuff, worm tubes, bryozoa, etc.

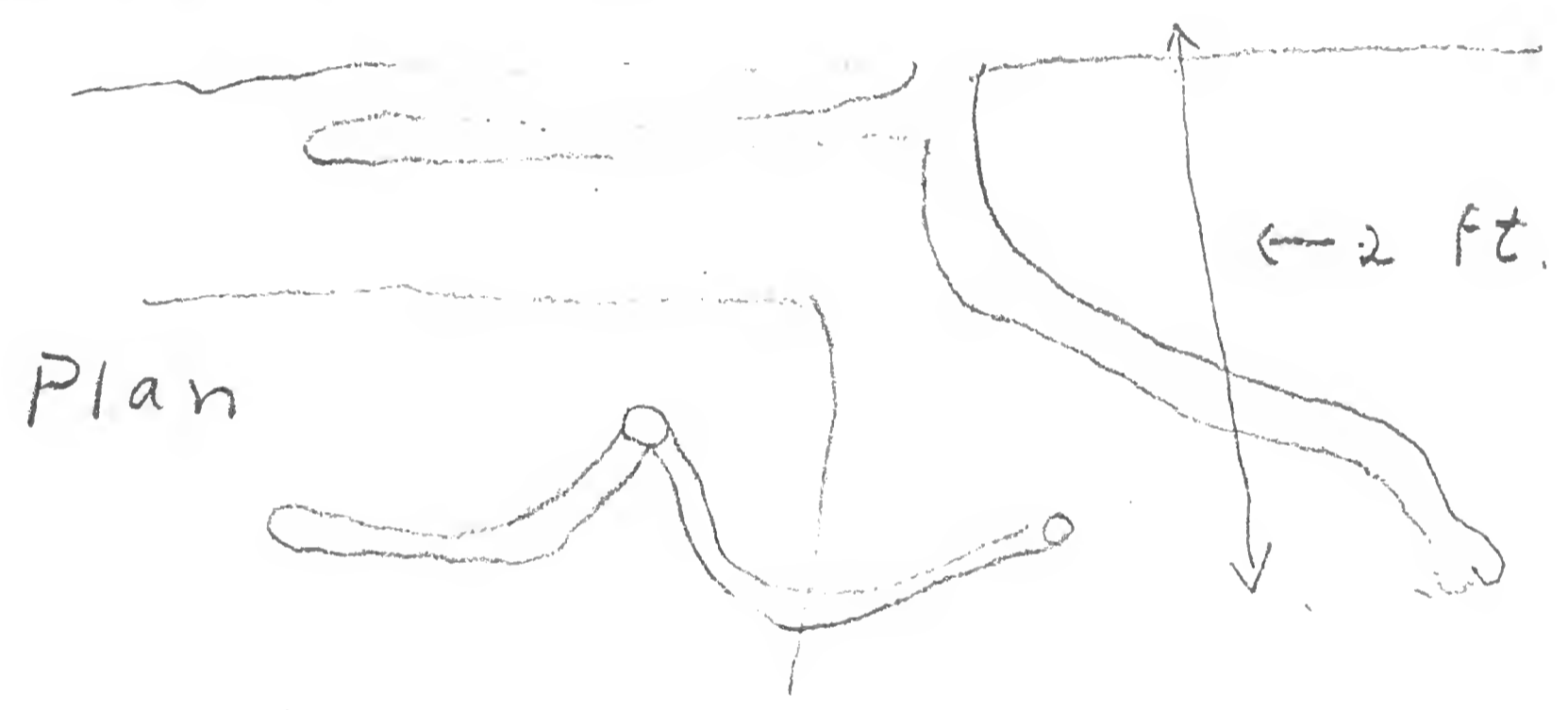
Green algae all over rocks, amphipods from them and bryozoa. Lydgia everywhere, I think I have several of largest; pool had a temp. of  $23^{\circ}$  C., or maybe a shade over. Water sample taken of pool.

Bacon Scholarship - continued

Sta. #3. Paqueta, Aug. 23, 1925.

2.00 p.m., tide low, about on turn in. 26° C. Mud beach was completely uncovered today. Small fiddlers caught by sticking forceps or rod in ground at angle to intersect hole about 4 inches from it and some below surface. Crab always came up near entrance, and so readily caught with fingers.

Dug in holes noticed in mud flat between large granite boulders on east side. Got a lot of small fiddlers, and three (smallest of 1 short only 2 deep) larger crabs, latter went as deep down as 2 feet. Used shovel. Just failed of getting a third of the 2 larger ones, holes seemed about 2 inches in diameter. Always had a lateral passage near the surface.



## Bacon Scholarship - Continued

Sta. #4. Pedra da Itapuca, Bay of Rio, Nictheroy, Brazil. Aug. 24, 1925.

About 1.30 p.m., tide 1/4 in; clear, sunny; in little embayment of shore lapped by approaching tide,  $25\frac{1}{2}^{\circ}$  C  $77.9^{\circ}$  F. Depth 0-1/4 fm. Rocky bottom. Ph. 8 on 5, 9 on 6, both end colors, so n.g.

Unfortunately got over on Pedra da Itapuca after tide had started rising, and so was unable to get much other than small stuff.

Saw a large brown mottled Portunid, but failed to get him. Current strong, lots of seaweed, but short. Petrolisthes I got, after being scared out from rock let himself drift in strong current all huddled up.

Sta. #5. Aug. 25, 1925. São Francisco, 9.05 a.m.

Salinity with Nat. Research Council salinometer 1026.3, Temp.  $71.19^{\circ}$  F. Second reading 1026, temp.  $72^{\circ}$  F. With Bur. Fish. salinometer 1024 to top of meniscus, temp.  $22-2/3^{\circ}$  C. O.K. 2nd reading. Tide falling? Start at Colonia side, 9.26,  $23\frac{1}{2}^{\circ}$  C. At surface on rock by seine haul, 11.00,  $23-1/3^{\circ}$  C. Hydrogen Ion #3 =  $\frac{6.4}{6.8}$ . Over by oyster beds  $23-2/3^{\circ}$  C. 11 o'clock. Color of shade or tint? 8.3 only darker, too much dye. 2nd test = 8.4 done next day.

Callinectes bocourti, "Cirij" puapa. (Cunha) spawn all year. In morning and at night 4.30. No tide all night.

Out in canoe, trunk of tree, 2 paddlers - 1 fore and 1 aft. Yesterday 15,000 (lbs.?) fish with 1 seine. "Tainhas" = mullet. 50 meters long, 1 meter at end, 8 in middle, ~~2xxx~~ 24 min. Fair sample of things at this place. 10.40 a.m. haul complete.

Caprella must have been on attached gulf weed literally by the hundreds. Pieces of weed saved with algae. Were stuck to algae by ant.

New canoe worth 1 conto (1,000 reis).

1925  
Bacon Scholarship - Continued

Sta. #6. Aug. 26, Conto do Rio. Temp. 25-1/5° C.

Water sample B. Water 3-4 inches deep.

Went over to get water sample in stream, found it flowing out. On upstream side of bridge got a few fiddlers from holes in sand and some amphipods. Saved a sand sample to find out how salt it might be; also water same (sample?).

There were some worms that looked like earthworms in it. Few fiddlers from same sand.

Sta. #7. Aug. 27, 1925. 24.9° C., water 2 1/2 ft. deep.

Went up river on Governador. Broad, shallow, muddy estuary, big mud flats on either side, mangrove swamps full of crabs, fiddlers, etc. Large Callinectes in creek.

Had to meet Fisheries Society at 4.00 p.m., so could not put my specimens up. Hope to do so in a.m. Got lots of other debris and water sample. No end of nudibranchs, some saved, all over and through bryozoa and sponges among bryozoa, on outside of latter only.

Sta. #8. Aug. 29, 1925. 24° C. ? Opp. Ilha Governador.

Oyster dredge. Laje de Fora. 6 meters - 3 fathoms. Mud bottom, shell frags., 100 meters off shore. Several Amphioxus, an ophiuran, 2 starfish. Lost tow net; got loaded with mud.

Aug. 30 at Pedra with Onge and Green.

Sta. #9, off Paqueta, nearest point to Rio, but toward landing stage.

Boat dredge 12.00 noon. Mud in bottom half of dredge, sand in top half. One little crab, starfish, and frag. of another, and keyhole urchin. 11 meters = 6 on sounding.

Captain João da Costo. ~~25x25~~ 25 m. long.

Ubirajára - name of 4th Indian met with in Brazil, helped the Portuguese when they first settled in Brazil.

Bacon Scholarship - Continued

Sta. #10 Paqueta.

Boat dredge 2.30 p.m. 4 meters deep. 25° C. Off road excavation, between it and fenced place near school. Many urchins, 2 starfish - different species. Sandy bottom.

Sta. #11. Off Paqueta.

17 meters off end nearest Rio near road excavation. Few shell frags., soft blue-black ooze, vial saved.

Sta. #12. Sept. 1, 1925. Ilha Govenador.

Below bridge on river. 10.07, tide still ~~xxx~~<sup>running</sup> out of stream, 24-1/3° C.

[Direction of current] over 8, but color too deep.

Below bridge collected over mud flats. Under rocks and sponges, plenty of latter, several species yellow, rose purple, and white, encrusted with stalked bryozoa, algae, etc. Tiny Xanthids in crevices and cavities. Got two small Crangon, gray-black and translucent whitish gray barred. Shed claws right away. Heard more than I could find. Collected bunch of sponges and debris for washing out amphipods.

#12. Ilha Govenador. Up river at old brick culvert. Fiddler crabs.

12.00 noon, just shortly after turn, running up slowly, temp. and sample taken off old culvert. Water temp. 31+° C., water sample on rising tide.

Ruined good picture of hole in ground by taking off back before inserting slide. Got a good representation of fiddlers up river where I was the other day.

Bacon Scholarship - Continued

Sta. #13, Sept. 12, 1925. Ponta da Rio, opposite below ferry.

11.20 a.m., tide high, but just turning out; sky overcast; temp. of air 69° F., surface of water 72° F. Depth 1 foot, bottom dead shells, on sand. In swamp where air does not stir, temp. 73° F. at 12.05, water 71½° F.

Start at 9.50, blowout on way to beach in auto truck of Confederation dos Pescadores. Rising tide, low at 9.00 a.m. Surf running from storm last night. No trawler since war, too much . Went out to get floating mines. Large canoe 300 \$1000, nets 12 x 1 wide, same deep. New net \$1,500. Arrastão 220-230 arms length. Ponta da Praia.

Z-1, 300 odd fishermen. Santos 9 Colonias. Government price fixed each day. No definite statistics kept.

Miserable rainy day all down good pretty well damped. Came in for but one net haul, but got a lot of Euchiograpsus ? narrow body from trees. These seem to climb way up in trees, caught in hand or knocked in can. Water 1-2 ft. deep around roots. Large crabs like at Rio, red and yellow, said just at water line, readily dropped out of sight. Little ones climbed as we went after them. One Palaemon proper from fisherman's net.

All today's collecting in mangroves below auto ferry in Rio opposite Z-1 colony. Except fish, Callinectes and Portunids. Blue ones and cocoa sandy brown ones came up in Jap fisherman's net at end of Bonde.

Sea was too rough for work. Most fishermen made no haul to examine trash of just one net wt. more than one or two others had hauled before we got there.

Sta. #13a. Sept. 12, 1925. Seine haul at the Barro, Santos, Brazil.

560 lb. fish in net few days ago. Mero.

7a. Sollers

Bacon Scholarship - Continued

Sta. #14, Sept. 13, 1925

Collected on muddy, sandy beaches between canals 4 & 5, Santos, and on mud flats about #5. Along shore got two little Upogebias color of my tripod, only much lighter. Got a few ascidians attached to side of rock among worm tubes in shallow tide pool. On mud flats, #5, under rock, found an eel and number of Xanthids and Grapsoids and Uca.

Saw a brownish alpheid in small pool under rock, but failed to get it. It was darker than Gebias.

Boys got a few Ciris (Portunids) and number of hermits.

✓ From Parsloe: Santos fisheries poorly organized, Sept. 11, 1925. Price of fish high. Shrimps run from 4-10\$000 per kilo and up as high as 20 in times of scarcity. Rio prices run from 2-3-7, the latter being the high figure. Fishermen are mostly poor and have only canoes. Motor boats are 30-40 M.R. per hr.

Bacon Scholarship - Continued

Sta. #15. Sept. 19, 1925. South of Villa Bella, São Sebastiao.

Collected along beach to south Villa Bella, seaweed washed for amphipods. One piece of gulfweed attached had number of *Epialtus bituberculatus* forms and several shrimps. 2 of about same size were blackish, maybe clove brown, with white marks in middle of back, rostrum and frontal and lateral margins whitish dirty. Next to largest one seal brown with white marks in middle of back; largest one sort of burnt umber X Prouts brown, with whitish mark in middle of back. Rostrum sort of fading into sage greenish distally, rest between largest and white fronted in color, but without white fronts.

5 tiny shrimps, 2 with spines on carapace (1= blackish bottle green, with last 3 segments of abdomen and tail from dirty transparent hair brown. Other= speckled sandy sort of drab grey & clove brown spots mixed, or color they would produce). Two with rostrum =olive X wax yellow; one with slenderest rostrum transparent with double stripe of olive yellow, mixed with little ochraceous on telson. Latter and tail from ochraceous rufous with transparent clear spot on base of telson as indicated.

Little hermit with sage green X olive markings, spots, or narrow bands, with wide bands of dirty whitish tinged with same color, but just degree lighter than dark spots. 3 small spider crabs dark muddy green algal color like lumpy alga. *Alpheus*.

Hazel Xanthid, dark fingers, legs cinnamon.

Small hand similar. Bars of bluish spots on large hand.

3 white bands.

Berlin blue with enough brick red spots to give at little distance heliotrope purple X china blue color. All forenoon, all day, collected



Bacon Scholarship - Continued

Sta. #15, Sept. 19, 1925, South of Villa Bella, São Sebastiao - Continued with morning low tide at 7-10 o'clock. Tide coming in by 9.36. Cloudy, threatening rain.

Done of morning of Sept. 20: Temp. at 6.30, water at surface  $71\frac{1}{2}^{\circ}$  F., air  $69^{\circ}$ . Air at 7:30  $71^{\circ}$  F. Water sample saved.

Sta. #15a

At night used townet and got any quantity of life of all kinds: crustacean larvae, fish larvae, amphipods, and some ostracods. One would think the amphipods were luminous. Net dragged back and forth few times, 2-2 $\frac{1}{2}$  ft. of water, 10.00 p.m. #6xx net, Bur. Fish.

Sta. #16, Sept. 20, 1925

Collected on stony beach, point of, beyond where we were yesterday, south of. Got number of Crangons and one Upogebia.

Pontonid. Chitin pale salmon buff, legs palest of pale olive buff, ovaries and egg mass showing through bright cadmium orange to orange, not all solid one color. Alimentary tract in body sort of green-clove brown-black.

Synalpheid. Pale buff pink with trace of vinaceous cinnamon mixed in edges of distal half of palm and all margins of fingers with fine line of bottle green, alimentary tract as in preceding.

Upogebia, now in dish, mottled pea greenish underlaid with tinge of gallstone yellow; last segment and telson without yellow uropods colorless. Hands, chelipeds pale ochraceous buff, which was color when caught under stone in crevices in gravel and sandy, some slight mud, but mostly coarse gravel. Carapace also without yellow chitin, with tinge of green that constitutes mottling. Yellow is from eggs. Legs all white.

Bacon Scholarship - Continued

Sta. #16, Sept. 20, 1925 - Continued

Crangon #A. Sort of light blackish bottle X sage green. Hands mottled with Nile blue, back with finer mottlings and blacker. Legs sort of salmon buff. Ant. third of abdominal somite white, not definitely marked off irregular white line, same true of tail fan; through<sup>out</sup> tinges of pale orange rufous, 2nd and 4th epimera with black spot near hinder margin, flagella sort of cinnamon X hair brown, which also seems to suggest tinge of body at times in parts; orbital hoods white except for black cornea, white area narrow on first few somites, very wide behind, half of last somite white, edge of tail pale tawny ochraceous to ochraceous rufous.

Crangon #B. Much like preceding, but general color very dark black green like myrtle green X marine blue, though no blue shows in green (black bottle green). There are tinges of heliotrope purple on sides and epimera, which are mostly whitish, but with noticeable, like the black part of indigo blue, narrow margins. Tail fan almost all blue, black, little white on anterior margins, and 1/4 or 1/5 of abd. somites white, making rather definite and conspicuous stripe as compared to black green, which is faintly speckled with dirty yellowish white; black spots on 2nd and 4th epimera as in preceding; around black cornea with tinge of lemon yellow, rest dirty white (grey), tail fan beautifully mottled blue. Chelipeds almost uniform darker sage X bottle green, a grayer green, as it were, than the body.

## Bacon Scholarship - Continued

Sta. #16, Sept. 20, 1925 - Continued

Crangon #C. Abdomen, carapace, and frontal appendages oil green. Tail fan and flagella lighter, hands darker = bottle green, more, in fact, ~~is~~ color from hinder end gets darker forward to hands. Tip of finger of large hand white, distal half of lower margin and tips of fingers of small hand tawny. Hands not speckled, but body color is, is made up of yellowish apple green, with sort of muddy chinese orange ? mottlings, gives ? green effect. Legs salmon, orbital hoods whitish.

Crangon #D. Color very much like B. Is a dark blackish green Crangon but without white; very little white, scarcely any spots ~~is~~ at base of tail fan, no black spots laterally, only orbital hoods whitish. Body mottled like preceding, but effect darker like "B." Little blue, no white or red on distal half of tail fan, practically none on base.

Petrolisthes. Distal joint, at least of 2nd maxillipeds, bright ultramarine blue, hairs of same orange rufous. Art. of fingers bright coral red, not to be seen when finger is completely closed.

Inner ~~part~~ front face of carpus = pale coral red X chinese orange. At base of front edge of palm = china blue; rest of palm = sort of cinnamon? Finger as on top. Back of crab sort of black part of olive green speckled with (finely) apple green; tip of movable finger with faint tinge of orange (coral red) at base.

Bacon Scholarship - Continued

Sta. #16, Sept. 20, 1925 - Continued

*Epialtus bituberculatus*. Brown of carapace  
 = bistre with blackish where joins white. Legs  
 walnut brown or chocolate. Propodi of last  
 two legs with brown band dirty white cheliped  
 ditto except palms distally and most of movable finger = clove brown, almost  
 black.

*Dardanus* and *Clibanarius*, legs olive X olive green, dark with white  
 stripe down inner and outer sides, tip of claw black, but just before it  
 spot of reddish cadmium orange. Flagella red-brown, dragon's blood red.  
 Distally antennular peduncle rufous. Distal mm. of last joint = azure blue?  
 Hands dark red, sort of claret brown ground color with spines? spots of  
 yellow, wax yellow. Flagella and peduncle rufous.

Sta. #16a.

Morning water sample, ebbing tide, air  $69^{\circ}$ <sup>F.</sup>, water  $71\frac{1}{2}^{\circ}$  F.

Sta. #16b.

Water sample, ebbing tide, air  $72\frac{1}{2}^{\circ}$  F., water  $71^{\circ}$  F.

Sta. #17. Sept. 21, 1925. Same place as #16.

Crangon same as one noted under #15. Eggs ferruginous.

3 smaller greenish crangons.

2 larger speckled generally ferruginous in appearance.

## Bacon Scholarship - Continued

Sta. #17 - continued

2 green clawed Synalpheus like Tortugas, claws bottle green, legs pinkish, body largely transparent, eggs and alimentary tract giving it an almost claret brown appearance. After time in dish looked bay. Tail fan and last abd. segment without color. Abdomen transparent but above looks colored, due to eggs.

1 with all green claw.

1 Upogebia shed both claws.

Sta. #17a. Sept. 21, 1925.

A tow net haul, net #6xx, in front of hotel from 7.00 - 7.30 p.m.

Sta. #17b.

With bobbinet dip net dragged along bottom, 7.00 - 7.30 p.m.

Sta. #17c. 9.45 p.m.

Still northward like preceding stations, but tide quite low, at about low point. Must have been ebbing on other two.

Sta. #16b

A second haul was made at this time and material dried to see if Newton Harvey could find luminous organisms in it.

9  
 Duplicate  
 Sep. 11

Bacon Scholarship - Continued

Sta. #18. Sept. 22, 1925.

Collected in stream for freshwater shrimps. Got several species, one and only one with yellow mark. Climbed out of 8 oz. bottle, traveled  $1\frac{1}{2}$  meters--  $1/2$  across table,  $1/2$  across wood floor and through hole in wooden partition, and  $1/2$  over dry clay tile under door and across granite flat walk in hot sun and was found on ground dead and pretty dry.

Only lower lateral stripe on carapace bright yellow and two submedian on abdomen; rest fainter yellow speckled with dark color. Telson with just a fleck of yellow at base inner blade of fan with oblique yellow spot, outer with a tiny one next spine. Two last 4 & 5 abd. epimera with bright yellow on back, carapace bluish of mummy brown.

dark color = tinged with claret brown elsewhere

lighter below dotted line = hazel transparent

yellow = lemon yellow

tail fan = dark of dragon's blood but darker basally. Ant. legs dragon's blood red.

x = violet

xx = maroon purple

rest of blade = wine purple

~~Rest of~~ Flagella colorless.

Bacon Scholarship - Continued

Sta. #18, Sept. 22, 1925 - Continued

One of three fair-sized Jamaicense color noted. Jamaicense seems opaque, translucent light green. Pea green with a black (marine blue on green) green line marking ant. margin of 1st, both margins of 2nd, and hinder margin of 3rd abd. somite, other somites behind edges of tail fan and telson margined with ? Carapace with tracings of the blue black green. Tips of fingers and articulating margins of joints orange ochraceous as are hairs between rostral spines. Spines of chelipeds blackish burnt umber, giving them darker appearance than rest of ground color.

Acanthurus vertically red striped on carapace, 3 irregular bands out of which ~~XXXXX~~ runs (bend) ? at right angles to frontal margin. Red = maroon.

General color pale wax yellow. Chelipeds pale pea greenish, becoming sort of china bluish distally. Articulations sort of orange ochraceous, as is distal end of palm at base of fingers, body distantly speckled with red, merely salted. Red spot on eye stalk. Red spot on ant. somites. 1st somite red spot. 3 stippled spots, 2 outer of red, middle one of indigo blue. Inner margin of antennular peduncle blue, continued on scale as line of dots.

## Bacon Scholarship - Continued

Sta. #18, Sept. 22, 1925 - Continued

Shrimp X, proximal half of finger blue, articulation of movable finger orange ochraceous, stomach showing through, otherwise palest olive yellow on dark hair brown. Eyestalks with spot of brown above burnt ~~xxxxx~~ sienna, back finely speckled with black.

Atya. Large one dead, a black green (clove brown X marine blue X bottle green?) with light stripe down middle of back. Small live one, transparent with small dark green speckles, giving it a darkish appearance, median dorsal stripe spreading out on each somite and little irregular on carapace, opaque yellowish white a little black speckled. Stripe little whiter than olive buff, tail fan as spread with hinder third without color, front  $2/3$  black, speckled eggs showing through and contributing to dark color of abdomen color of dead large spec., sides with maybe a suggestion of lighter colored stripe like on back, but more a sort of mottling.

Tiny shrimps, almost clear transparent french blue speckled scatteringly except on telson and tail fan, which is margined with pale tawny, its only color. Blue spots little larger in groups of four on median line at hinder margin of each abdominal somite, never pale china blue, stomach and ant. half of intestine bay or burnt umber, thicker antennular flagellum same but much paler, other antennal flagellum even paler and distally without color, cornea grey, black center, black spot at middle, outer clear margin with suggestion of brown. Carpus and base of propodus of legs only part of these appendages noticeable, just little dark colored, don't notice any of these with eggs.



Bacon Scholarship - Continued

Sta. #18, Sept. 22, 1925 - Continued

Largest Acanthurus of this day with pea green eggs, much more thickly and heavily speckled with red, quite dark, fingers are felted, abd. epimera with oblique red stripes. Midriff of rostrum reddish.

Water sample taken out in front of Hotel, low tide, beginning of flood.

Water  $77\frac{1}{2}^{\circ}$  F., Air  $76^{\circ}$  F.

Sta. #19, Sept. 23, 1925.

Fished same stream again, got 2 large Jamaicense. Are quite a greenish blue, marine blue X french green broad stripes olive buff X olive yellow, tinged with light Nile blue. Telson all dark madder brown, Chinese orange edge and coral red tinge. ??Red color on tip of tail due to partly moribund condition, not seen in life in these big ones. Chelipeds marine blue, blackish flush of French blue at articulation. Legs on dact., carpi, and propodi dark China blue above, lighter below; meri and ischium much paler, nearly whitish.

Bacon Scholarship - Continued

Sta. #18, Sept. 22, 1925 - Continued.

Kept couple of large *Atyas* over night in basin with brownish sand and whitish grains in it. *Atyas*, which were quite dark green like shadows under rocks, assumed a general tawny olive color. Whitish stripe down back became wood brown (or buff) down middle and cream buff at sides, stripe good 3 mm. wide in largest spec., irregular black 1 mm. wide more or less to either side of median stripe, rest of animal the tawny olive with mottlings of black (green?) but not so much black as tawny, lower on sides mottling = more reticulations of tawny and clay color. Spines of legs dark brown burnt umber, legs themselves either fawn or vinaceous, or between the two.

Little shrimp of 2 kinds? One lot quite transparent, with grey-black markings, very little blue or green appearing, and dragon's blood red stomach and alimentary tract, faint blue spots on dorsum of abdomen = A.

One lot quite greenish with dark, almost black bottle green stomach and green-black-blue marks on back of abd. = B. (Rest miscellaneous.)

Sta. #20, Sept. 24, 1925. Weeds from rock in front of hotel.

Portunid from beach, general color sort of sage green X hair brown, with chelipeds largely same as general color of carapace, hair brown X greenish tinge, spines nearly all porcelain white, their hinder margin and anterior margin of carpus between them shiny clove brown, inner face of hand and carpal articulations china blue, fixed finger all white, movable one coral red to scarlet.

Bacon Scholarship - Continued

Sta. #20, Sept. 24, 1925 - Continued

Paddle legs like chelipeds, margins of joints by articulations salmon, proximal half of paddle and adjacent joint white, distal half sort of raw sienna X gallstone yellow; transparent in case of white & yellow of paddle. Under parts whitish.

Fisherman brought me 2 well developed olfersi and female of same surely and a Jamaicense = soft. The two females were of a general Vandyke brown color, the one overlaid with bistre or olive, the other speckled underneath with madder brown. These darker colors were general and mottled, under all being a sort of clay X cream buff color which showed through in hazy lines on carapace, making it appear a little streaky, especially somites, extending down on sides about to top line of epimera. The bistre spec. had a blue, black (dark) green large cheliped, the other black brown had black rest and small chela, Vandyke brown, legs of both more or less transparent of ~~finely mottled~~ fine suggestions of faint marine blue spotting in bands of second speckled prouts brown.

♀? more russet in color, marked like males, legs almost white with few dark mottlings of brown on anterior face, large chela mottled with larger patches of marine blue (light) on inner and outer margins and fingers are a faint pea (bluish) green ground, portions of somites 1 & 3 behind clear area much darker than any other part of body, and blackish.

The Jamaicense has long stripes of marine blue, black-bottle green, others of buff, but lower lateral carapace bright yellow, marked like red brown shrimp of other day, except that below yellow on sides was pea green for length of body and abdomen. Legs china blue, smaller chela prune purple (light or pansy purple) with tips of fingers and basal half of fixed one whitish at spot of white inside at distal end of carpus and proximal end, too, a smaller spot.

Bacon Scholarship - Continued

Sta. #20, Sept. 24, 1925 - Continued

Large chela marine blue, washed out to whitish on inner fixed finger, margin of palm, carpus, and spot at distal end of merus. Telson and back of carapace marked like rare shrimp.

Sta. #21, Sept. 25, 1925.

Went back to stream to see if I could find young jamaicense, but though I looked at them all afternoon and in a.m. on 26th, couldn't make much out of lot. Got, however, 3 fair sized ? jamaicense with black cross bars like one color noted under #18. And one striped brown one like we had been offering reward for, but not so red-brown. Bottled in vial. What can be the red ones have just recently shed and the blue-greenish ones with yellow stripes are about ready to shed. I would say so because, in dying, red-brown ones get blue.

olfersi great jumper, can snap themselves almost a foot through the air, 6-8 high and foot away, and walk as well on--4 footed animals.

Sta. #22, ~~1925x~~ Sept. 26, 1925.

Went back to stream for oligochaetes. Luederwaldt has them all quite a number. Also, incidentally got seven shrimps, one cross barred jamaicense like one under #18, smallest jamaicense I have seen which I know is that species. (But what are the long barred ones?) Two acanthurus, also smallest I think so far. Rost. and red <sup>vertical</sup> vert. stripes on carapace definitely identify it. Also an Atya with light stripe down middle. And 3 characteristically speckled olfersi with dark cross bands on hinder margins of first 3 abd. somites; darkest and most conspicuous band on hinder margin of 3rd with characteristic clear transversely rectangular area in front of it.

Bacon Scholarship - Continued

Sta. #22 - Continued

Clear sunny day, water temp. in Rio Taguanduba where we collected =  $69.75^{\circ}$  F.

Sta. #22-A.

Water sample out in front of hotel, surface, 1 ft. water. Air  $74^{\circ}$  F, water  $74\frac{1}{2}^{\circ}$  F. Just after turn of tide. Tide high, just beginning to ebb, 1.30 p.m. At 5.45 p.m., temp. in front of house  $78^{\circ}$ .

H.I. = 84 on last prism. Density 1023.5 at top of meniscus, temp.  $72^{\circ}$  F.

Crest of tide at or just before 22 "C", ebbing little with "D" still more. Intermittent moon between clouds. Townet haul at 9 p.m., 22 "B"; 11 p.m., 22 "C"; 1.00 a.m. 22 "D". In front of hotel, 2 feet water, surface tow.

Sta. #23 & 24 both Paranagua, Brazil. Tide flat collections.

Sta. #23, Oct. 2, 1925.

Collected beyond car barn of bonde of Paranagua. Got a few small fiddlers, so young and small that they went all to pieces. The Crangons in the bottle with them are part of Oct. 3 collection, which I have given #24, Oct. 3/25. ~~It~~ Though it is hardly worth while to keep separate for want of bottles, 3 amphipods are with little Pinnotheres from Villa Bella, which happens to be in my grip yet.

The square grapsoids in both #'s were from higher up on beach than other crabs in #23, well back in puddle on almost dry land. The Portunids are only from #24. Things are separate, except for Crangons and Gebias from #24, which are with #23.

#23, Oct. 2, Clear day, large clouds, sunny, tide high, coming in it seemed, or just ebbing.

#24, Oct. 3, overcast, rainy drizzle in forenoon, cloudy but clearing it seems at 12 o'clock; tide low at about 8 o'clock, coming in later. #24 tide flats off last pier to N. at Paranagua rocks covered with dead and few living oysters on sandy mud flats.

## Bacon Scholarship - Continued

Sta's. #23 and 24, Paranagua, Brazil, Oct. 2 &amp; 3, 1925 - Continued

Got one broad clawed Uca this afternoon as I took picture of ship. Flattened him out with tripod head. From same place as morning collection, but in afternoon, 2.30 p.m., with high tide.

Oct. 6, 1925

Left at 9.15. Arrived 12.30. Half hr. at Managua <sup>(8 boys not there)</sup> Mill. All girls but 2. Had to be ferried over river after leaving horses at house. 2.30 at end of journey, after coffee. 3.15 to Praia Grande. 17 children, 2 families, Ribeirao de Bananal. 6.15 p.m. started back, got to hotel about 10.30 with 3 stops on way, one at Managua Mill for shrimps, and other for water, and last for something to eat.

Sta. #25, Oct. 6, 1925. Praia da Enseada

Air temp. 67-3/4° F.

Got a Lepidopa and 1 tiny Hippa on beach in front of German house facing lighthouse. Before that, sailor got 3 molluscs at the other end. At house got some shells.

At Praia Grande got lot of hippas, few quite large, but not so large as the natives claim they come. And a few amphipods. Praia Grande is across two points of land behind house.

Sea was very rough and high due to high winds night before. Really shouldn't have made trip, but in town didn't realize force of surf on outside of island.

Sta. #26, Oct. 6, 1925

Children at mill got me 2 crabs and several shrimps from stream back of mill. One shrimp was quite brown in ~~xxx~~ life, looked like the black of Prouts brown or same of burnt umber, all over claws, too. The largest of the Trichodactylus was generally (only one alive next a.m.) a raw sienna, darker on carapace due to spottings and mottlings chocolate and mars brown, same on upper margins of all appendages, weakly on large chelipeds, on upper margin only,

~~Parangue, Br.~~

Bacon Scholarship - Continued

Sta. #26, Oct. 6, 1925. Praia de Enseada<sup>n</sup> - Continued

faintly and narrowly, but in case of legs extending back on upper or hinder face of joints, except for distal end of carpus. Carpus and ischium and hairs almost all light, distal  $1/3$  of propodus light, dactyl however nearly uniform raw umber, little lighter on lower margin, eye stalk spotted more of bay or maroon color than what I said above, especially on eye stalk. Other shrimp show coloring of olfersii on casual examination of dead specimens next day.

São Francisco do Sul, Santa Catharina

Sta. #27, Ponta da Cruz, São Francisco Oct. 7, 1925

Air  $72^{\circ}$  F., water  $71\frac{1}{4}^{\circ}$ , oyster formation. Point of land north of town past R.R. Sta. Large rocks for most part. Covered below high water line with oysters.

Got 2 holothurians and one starfish. Oysters and oyster crab, 2 Gebias and pc. of rock.

Density 1022.2, temp. 72.5.

Oysters very abundant on rocks; very salt to taste.



## Bacon Scholarship - Continued

Sta. #27 - Continued Oct 7, 1925

80-100 (ca. 90) oysters gave small mug of meats and juice. Cup = 6 high and  $6\frac{1}{2}$  cm. ~~XXXXXXXXXXXX~~ wide over all, juice drained off left meats  $2\frac{1}{2}$  cm. from top edge of cup. Meats small and very salty to taste. Oysters hard to open, very irregular.

In about 90 oysters found 4 prs. and 3 or 4 others of which one or two were in shucked oyster and there is one with the amphipods. 12 crabs in about 90 oysters. Ruined my hands getting them opened.

The interesting thing is that always found male with each ovigerous female; no exceptions! Among shucked oysters found a male.

Hind pair of legs, in females at least, carried up over back like dromids. Are very helpless outside of oyster, do not seem to be able to balance, and are always seeking to hang on to something with hindmost legs.

Sta. #28, Oct. 8, 1925

Left hotel at 6; arrived at mill 9.30, at beach at 11. Nearly low tide? Low at 11. Air  $72\frac{1}{2}^{\circ}$ , water  $71^{\circ}$ , 3.50 p.m., high tide. Left at 2.45, arrived hotel at 6.00.

Sta. #28, Oct. 8, 1925

Praia da Enseada. Water sample; Hippas mostly from rocks at beginning of Praia facing lighthouse. Density = 1025 to top meniscus, Temp.  $73^{\circ}$  F. São Francisco, Sta. Catharina, Brazil.

Sta. #29, Oct. 8, 1925

At mill again. Collected myself ? got another crab, ~~XXXXXXXXXXXX~~ said they were very rare. Shrimps and 1 crab. Few insects, one like large roach with wings. On way to Praia. São Francisco, Sta. Catharina, Brazil. Goose egg brought to me by Herr Concinni.

## Bacon Scholarship - Continued

Sta. #30, Oct. 8, 1925.

Praia Utatuba, water from Ribeirao drainage, from ditches near praia facing lighthouse. Sao Francisco, S. Catharina. Freshwater fish and mollusks, and few insects.

Sta. #31, Oct. 10, 1925

Collected along banks of Rio Negro above R.R. Bridge where boat of Zornig Hotel ~~Zoring~~ is tied. Got insects only. Conconi didn't even get a fish on hook and line, though we saw many.

Oct. 11, 1925.

61° at 7.50 a.m. on my hotel window sill. Sky overcast. In spring, 61° F.; in eddy of stream 61-3/4° F.; on window sill 64-3/4° F. in shade, got hotter in afternoon. Bright sun at 12 noon.

Sta. #32, Oct. 11, 1925, Sunday.

Used small birge net. Made townet haul in stream and in small spring on bank.

Collected along tributary of Rio Negro, on Mapa, Sta. Catharina side of river, entering above RR bridge. More insects and a townet haul; did latter for small spring on bank where I "fished." Later, on way back to hotel, dug into a termite nest, hard sand and clay mound; got a few specimens for Light. It's not the stuff he wants, but it may be of use to him. Pulled up two small stumps and collected samples of ants present; were surely two species of ants in same stump. Have bottled lots from each; stuff all together, but stumps separated.

In afternoon collected in holes in brick yard from which clay had been dug. Zornig tells me they are flooded during high water in the rainy season, summer. That's how fish get over. These species I have may be three, <sup>[there]</sup> are larger than specimens I managed to catch, surely. 2 insects and several tadpoles.

Bacon Scholarship - Contined

Sta. #33, Oct. 12, 1925, Monday.

Put out fish-trap last night; hauled it about 8 o'clock this a.m. Water temp. 66° along shore, Rio Negro, Parana side.

Female that carried young has both antennal flagella and one (right) chela dactyls pale turquoise blue beneath, first pair above, too; carapace dark, black bottle green. Distal half of fingers dark turquoise blue, legs more an olive green above; but black abdomen shading out to sort of sea green on second somite, blue on third; flagella black like carapace. Under parts between clay and ochraceous color, whitish on basal joints of legs, and base of telson, blue on dactyls, and bluish on propodi. Last two joints of 3rd max. turquoise blue.

Second specimen with only one claw, ischial and basal joints white, rest of legs turquoise or glaucous blue beneath, abdomen all blue beneath, sternum mars brown. Above carapace and abdomen much alike, bottleX myrtle green, mars brown toward sides and on rostrum. Pick them up by legs and they play dead, all spread out.

Largest specimen, instead of blue, has plum purple end of blue above and royal on under parts, sternum and telson practically white with faint traces of purple. Articulating membranes coral red, carapace black of bistre with raw umber on high parts. Hands Indian purple; proximal parts of ischium sort of buff color. Fingers distally prune purple. Zornig says he has seen quite red ones.

Sta. #34, Oct. 12, 1925

Collected with dip net through Herr Zornig's garden stream. Got but few fish and small tadpoles. Took films by photographer. Looked at Zornig's wonderful garden. Visited museum at Convento, fine little place and some rarities. Brazil is so little known that you never can tell what will turn up--

Bacon Scholarship - Continued

Sta. #34, Oct. 12, 1925 - Continued

birds, mammals, and stone implements. Got about a dozen different sizes. Ask to borrow for casts if Judd wants to do so. Has fine collection of ant guests. Picture of Bill Mann with Reichensperger. Stuff off (of?) mounted Steiger of Munich. Now living in Rio Negro.

Sta. #35, Oct. 13, 1925. (Color still recognizable, Feb. 27, 1940--WLS)

Fish pot. Carapace and abdomen of Aeglea dark of grass green, with a suggestion of parrot green? Membrane between abdominal somites maroon or claret brown. Legs marine or indigo blue. Carpus of chelipeds grass green, little on distal portions of merus, proximally merus like inside of hands are dirty cream buff. Membranes of joints of legs more ferruginous. Palms grass green, fingers of left side like legs, of right side tending distally near tips into royal purple. Under parts dirty cream buff. Max. faintly with blue and lemon and last 2 or 1 abd. somite faintly with green and purple like poorly dyed Easter eggs with Paas dyes. Spines whitish, or corneous tipped.

Pick Aeglea up by one leg, it freezes.

7-8 p.m. Cast net, maybe a dozen casts.

Sta. #36, Oct. 14, 1925.

At water rapids above R.R. bridge at Rio Negro, Parana.

#36, Aeglea. Dark blackish bottle green on back and abdomen; legs, chelipeds, and palms bright grass green; ambulatory dactyls buff--cream buff, fingers tipped and edged with buff hairs at anterior margins of joints and articulating membranes dragon's blood red. Underparts and telson <sup>and</sup> ~~of last~~ last 3 abd. somites (those bent under) all plain buff, maxillipeds, too. This one in cast net, night of Oct. 14.

Bacon Scholarship - Continued

Sta. #37, Oct. 15, 1925.

Air 58° F. Rio Negro by Fish pots near bank. In water 64° F., 1 foot deep.

(1) Smallest ones bistre X olive green; legs flushed with purple, fingers too. Dactyls quite auricular purple, but lighter than book. Little ones, legs break off easily. Legs purple beneath, under parts cream flushed with light purple.

(2) Two quite blue. Carapaces both dark bottle green. Fingers and outer half of palm of one and dactyls bright french blue, of other sea green. Telson and several under-turned abdominal somites like outer parts of hands and dactyls, french blue. One has hands, legs, and telson, etc. ultramarine blue below, rest quite white. Must live in crevices, they freeze when picked up, is part of spread-eagle effect when you try to lift them out of bottle front end first. Resist quite strongly.

Sta. #37a, Oct. 15, 1925.

Got 1/2 dozen Aegleas. One had young. One had peculiar swelling under abdomen. What is it? One was feeding on stuff attached to rocks. In bright sun though water overcast this a.m.

## Bacon Scholarship - Continued

Sta. #38, Oct. 16, 1925

Boy went down and got trap, brought me 3 Aegleas. Like yesterday, all three were uniformly ~~xxx~~ olive with touch of olive green, very dark color all over, just little muddy or greyish in suture lines due to distinct hairs. Fingers of hands, margin with orange chrome, dark part, lighter below, sort of flushing. Movable finger, one spot at articulation. Dactyls, distal half saturn red or orange chrome light flushing at beginning, green basal half. Largest specimen bluish on central portion of sternum = touch of cerulean blue? Telson and abdomen folded under, and under side of propodi, carpi, and outer side of hands and max. dirty chromium green. Under parts generally dirty white. Antennae like back, antennules little brown ~~greyish~~ greyish, faint clay color, sort of inconspicuous. Can right themselves very readily; laevis couldn't. Little ones freeze when taken by legs, not so big ones.

*Dr. M. ...  
...  
...  
...* Water 64-3/4°, Air 72°.

Sta. #39, Oct. 17, 1925. Saturday

Cleaned stream about of Aeglea. 2 doz. Aeglea from stream. 9.30 a.m.  
Air 72°, water 66°. Nothing in fish pot.

Called on Giffis in afternoon.

Bacon Scholarship - Continued

Sta. #40, Oct. 18, 1925. Sunday.

By Hacienda Marumly with Werner Nikol and rest got couple dozen Aegleas and number of insect larvae. Air 68°, water 70°.

Sta. #41, Oct. 19, 1925. Iapo. Monday.

With Midkiffs to rapids beyond Instituto about 30 mins., in rain return. Got 9 Aeglea. Air 67°, water 69°. Get Weather Bureau data.

Sta. #42, Oct. 20. Tuesday.

Got about 2 doz. more Aeglea, a few as large as any I've seen, but still smaller than the folks here claim they grow. 2 ♀ 3 ♂ out for Felippone, not quite largest. 1 male near large size, not as much as 1/4 in. shorter in carapace. 1 ♂ & 1 ♀ small to show size difference if any.

Sta. #43, Oct. 21, Wednesday. Rio Negro.

2 Aeglea, but fish pot empty.

Sta. #44, Oct. 22, 1925, Rio Negro.

Last day in Rio Negro. Got one crab less claws and 1 large Aeglea laevis, largest I've yet seen.

Bacon Scholarship - Continued

Sta. #45, Oct. 28, 1925, Wednesday. Ponta da Cruz, Sao Francisco, Sta. Catharina.

Low tide at about 7 a.m. Went back to where I got Gebia before to get some pictures and found such a number and excellent chance to study them that I have decided to spend a couple of days.

Got several Crangons. Smallest one, ant. Fig

half each abd. somite transparent chitin,

post. half =

Legs colorless, chelipeds maybe ochraceous rufous, becoming mummy brown with a touch of olive above and before groove, lighter below under groove, almost white, as is lower half of Fig finger.

In larger, non-ovigerous specimen, brown bands are wider and when abdomen is extended hardly see colorless areas. Telson, distal two-thirds burnt sienna, almost; proximal third colorless.

Carapace of each with brown saddle above on <sup>front?</sup> post. 1/4 light nearly clear on sides and before saddle, stomach a dark greenish brown (?burnt and? umber X olive), depressed areas a large hand sort of pale olive buff or sort of olive yellow, legs at distal ends of joints and on upper margins with a narrow line of vermillion. Largest specimen ovig., brown on dorsum of carapace, almost the black, at least the dark, of Vandyke brown. Greater part of epimera colorless, only post. 1/4 or 1/5 brownish. Carapace above same dark brown; chelipeds like preceding; carpus like hand; merus like legs.

Chopped open lot of soft rock and got quite a number of Gebias. In first rock, photo'd, triangular about a foot on a side and borings <sup>7</sup> in top small part of 6 inch thick got 4 pairs (8 specimens).

Then chopped open a more honeycombed rock, uncovered a nice burrow. Female seems to be in plugged burrows except for small holes for water; outside of plugs in burrows find males, or at least eggless ones. Pried up rock and got



Bacon Scholarship - Continued

Sta. #45, Oct. 28, 1925 - Continued

a number of things, 2 small fish and few amphipods, sponge fragments in one canal near outer end. Two Xanthids; large one same species escaped.

27-10-25

Crangon

Tiny Portunid in burrow of Gebia. Longitudinally striped with crimson X poppy red (mostly crimson). About 4 stripes, two parallel, on back at middle of carapace, at black green spot marking stomach, leaving out part of carapace transp. and colorless except for jet black eyes, which look like Crangon, lateral stripes run over carapace and abdomen, up and on to tops of antennular peduncles, all stripes with glass = ? around ? which are arranged in lines, telson and inner uropods red, outer white except at articulations ? . Chelipeds, sides, and legs white. Lateral stripes only on top half of epimera and at same level on carapace.

## Bacon Scholarship - Continued

Sta. #46, Oct. 29, 1925. Ponta da Cruz, Sta. Catharina. Combined with #45.

Temp. air at 12 noon  $71-1/3$ , water incoming tide 71.

Got a lot more Gebias. Can stand very stagnant water in which all crabs died naturally. In pockets in rocks where they live must become very foul in course of tide.

Found 4 small red striped Crangons lying against mud wall of mud tube. The red is quite an intense poppy red and the lateral stripe across the epimera is the strongest and most conspicuous. Stomach of one bright apple green, should say almost emerald green.

There were several green Crangons, of which I have color noted one. Hands the dark of bottle green. Pea green speckled finger tips and a little along cutting edge ochraceous, hairs fringing telson and tips of flagella where they attain and surpass finger same color. Corneae black. ~~Corneae black~~. Color takes in most of abd. epimera. Post.  $3/4$  of abdominal somites + bottle X terre vert green on a porcelain whitish ground but not clear ground. Only in case of carapace and abdomen, unlike chelae dark color is in specks and white is ground. Post. margin of telson and tail fan white just before that touch of blue (Paris) then bottle green. Black spots as indicated on 2nd and 4th epimera near hinder margin before articulation.

Of the tiny fiddler crab only saw 2 or 3 holes, got 1 male and female. Also found Eriphia gonagra, 3 spec.

Of the Upogebias the abdomen of most is bright orpiment orange, as are eggs of all ovig. Legs white, chelae with flush of buff pink or vinaceous pink. Other legs opaque white; telson mostly transparent; stomach showing particularly on sides, between slate and indigo. Many have carapace and

Bacon Scholarship - Continued

Sta. #46, Oct. 29, 1925, Ponta da Cruz, Sta. Catharina - Continued

central third of median dorsum of abdomen a sort of slate gray. Not so noticeable in field as in white plate after some hours. Hairs on fore part of carapace dirty cream buff.

Got one isopod for Maloney.

Sta. #46B

~~Wh shrimp with toothless rostrum = mostly transparent. Most conspicuous thing~~

Shrimp with toothless rostrum = mostly transparent. Most conspicuous thing was apple green stomach, above which carapace was colorless, but around which and on sides were faint red chromatophores; abdomen with scattering of red spots; eyes blue black; legs blue like watered milk. Chelipeds, or maybe maxillipeds, anyway the heavy anterior link with darker red and some few blue spots below distal margin of antepenultimate joint red (dark).

General red flecks = poppy

Dark red = poppy with dark of crimson

Blue spots = azure, about, or cobalt.

This shrimp like all found in burrows. Some Crangons in crack or under rocks. This last + little red found in good, inhabited by Gebia burrows.

Sta. #47, Oct. 30, 1925.

Went back and collected in rain. Got fiddlers ~~xxxxix~~ out of sand near stream--just one little place.

Fingers of large chela white, outer side of palm, carpus, and merus little distally flushed with ochraceous, in some others about lemon yellow, which is color of legs; back slaty X olive green mottled.

Bacon Scholarship - Continued

Sta. #48, ~~Oct~~ Nov. 1, 1925. Last day in Sao Francisco - day before ship sailed.

R.R. ditches. Fisherman F.W. on second.

Schmidt went with me; he picked up lot of stuff I had gotten before, but I saved it as I hated to throw it away.

Sta. #49, Nov. 5, 1925. Florianopolis.

Quiet, clear, sunny day.

Collected at rocky point at end of Praia da Fora toward bridge, but mostly on rocks, at/bridge end of Praia. 8:30 a.m.

Water sample. Air  $71^{\circ}$  F., water  $71\frac{1}{2}^{\circ}$  F. Tide nearly out, just before slack.

3 Palaemons. Saw four in shallow water about rocks, over sand, water about a foot deep. Just happened to see them moving as I picked up crabs. Hard to see, apparently prefer sand bottom. One of Palaemons was in sea weed with amphipods. When I scratched up weeds he backed out; fished him and other two with net.

Amphipods thick in ulva. Lydgia plentiful.

Two terrestrial isopods, one in road home from Praia, other among leaves of bank above rocks.

On way back collected grapsoids on sides of (sewer?) small stream into which tide backs. Got lot all sizes.

Palaemon faintest kind of transparent tawny olive; hinder margins of abd. somites with sort of bistre mixed with tawny olive. Couple of faint lines of raw umber across dorsum. Antennal scale also margined with color.

Bacon Scholarship - Continued

Sta. #49, Nov. 5, 1925 - Continued

Backs of rostral teeth and carapace with dark lines as shown. One under eye extends along antennular peduncle; tail fan also margined with color like abd. somites and carapace stripes.

Legs china blue, darker on upper margin. Distal margins of joints, palm, and fingers with quite a conspicuous band of orange ochraceous. Articulation of last 3 abd. somites with orange spot, last of which is where uropods articulate.

Lost a nice vial of ascidians, and though I went back just before dinner and looked high and low, couldn't find it.

Sta. #50, Nov. 12, 1925. Prado with F.F.

A.M. 4 F.W. fish. Water too muddy and high for Aeglea.

Stream Arroyo

Miguelite

#2 Bonde

Volto      Vuelto

Barnacle    Lapas\_ (From Lepus?)

Bacon Scholarship - continued

~~About Montevideo on way to Maldonado~~

~~Country is like Kansas prairies, flat and undulating, but very nice and green, and, though flat, well watered. Trees appear in clumps (groves) and may have been just planted. People, the common people, seem more upstanding than run of Brazilians, or do I imagine it?~~

~~Felippone is Italian, of what did he say, 18 years here? Old sea captain was out, has bridge on house.~~

~~Day hot as blazes.~~

~~Boys and many men run around all day with long linen dusters or smocks of duck.~~

Sta. #51. Nov. 13, 1925, Friday. 5.35-5.50 a.m.

#51 #1, Instituto da Pesca.

2 small crabs, one with madder brown eggs.

1 isopod and several Pasiphaea.

1 isopod.

2 crabs 1 1

Pasiphaea

1 Xiphopeneus

1 Peneus setiferus

- 51 ) Crustaceos  
 52 ) All combined, number of Pasiphaea  
 53 ) Chimaeras had shells in stomach. Saved some.  
 54 )

Callorhynchus Gronovius for Gem. 1754 callorhynchus L.

"Gallo-Quimera"

## Bacon Scholarship - Continued

Sta. #51. Nov. 13, 1925. #1. E. Isla de Flores (Approximately 6 millas)

Instrument used: C. thermometer on ship.

Temp. air 19°5

" depth of 7 fm. 19°5

Depth: 7 brazas

Nature of bottom: barro (mud)

Color of water: green

Pasiphaea eaten by Corvina and Porichthys (midshipman)

Pasiphaea tail carmine, not telson, but bases of uropods in spots,  
little distally.

Fig

Chimaera

At 2.00 p.m. H.I. 8.15. Sample of water saved.

Sta. #52 (#2 Instituto), Nov. 13, 1925.

Bearings: E.N.E. Isla de Flores (prose 7 millas)

Time of day: 9.00 a.m.

Temp. of air: 22°0

" bottom: 19°0

Depth in fms.: 7½ brazas

Nature of bottom: barro

Water: Verde

## Bacon Scholarship - Continued

Sta. #53 (#3) Nov. 13, 1925. N.E. Isla Flores (Approx 5 millas)

Time of day: 11

State of sky: Cloudy

Temp. air: 24°

" bottom: 19.°75

Depth in fms.: 7½ brasas

Nature of bottom: barro

Water color: Verde

Sta. #54 (#4) Hora 3. E. Isla de Flores (about 4 mi.)

8 fms. barro

Air 26° Water 20.°5

Verde

Sta. #55 (#5) Hora 5.

S.of Isla Flores about 5 miles.

Barro.

Air 26°; water 20°, ~~xxxxxxx~~ 2.00 p.m.

Verde

Density: 1006.51

Temp.: 70.°5 or 6



Bacon Scholarship - Continued

#56, Nov. 15, 1925. Excursion train to Maldonado.

Hotel failed to wake me at 4.00 as I asked, called me at 25 of <sup>4?</sup> 5? and I had most of my junk to stow. Felippone came by in taxi at 5 to 5.00. Got on wrong train first, then changed over to a very crowded one. Here people hold seats right and left and it is hard to get an unoccupied one. Excursion all girls it seems, but very few good looking ones. Look like shop? on a picnic. Don't know when the train starts, but there seem to be two sections standing on the track.

Such a jabber, and I can't understand a word right or left. Car we are in sort of buffet (or dining?) car, four folding seats opposed. At end is sideboard and lot of tables behind a little counter. We are beside two thin ones. The young bloods are walking up and down <sup>outside</sup> ~~alongside~~ rubbering in the car. Skirts are not so short as in Brazil. A priest with black hat accompanied by Franciscan had green ribbon in hat. Everybody, at least all women, clapped hands when he went by and old nun smiled and nodded to coaches right and left of ramp. The mens black straws are common here as in Brazil.

In the rush of leaving hotel, got cap on my head instead of hat. Glad I dressed and took my old clothes and shoes along; they wouldn't have let me aboard otherwise. This is a regular Sunday excursion in every sense of the word. There is a special Catholic excursion on, two of girls have tied green ribbons around head. Was note in paper about arrangements for the day.

Arrived Maldonado 11. a.m.

To auto to town 30<sup>?</sup> each, walked to Burnets forest, ate lunch, dickered for a ride with taxis to Punta del Este. Wanted 3, 4, & 5<sup>?</sup>, each higher than next one. Tried horse and wagon, but <sup>?</sup> again. Finally asked policeman outside of church and he told us of a bus at 1.00 per head and return, and 2-hour stop. Punta del Este looks like a good place, and we will go back for Friday, Saturday, and Sunday of this week. Got a few things, crabs and Xanthids.

Bacon Scholarship - Continued

Station #56, Punta del Este - Continued

Got a few amphipods if they don't spoil on me. Density 1014.00, Temp. 70.5° or 6.

Grapsoids under rock and in seaweed, mostly in water or where there was water, tide pools, etc. Lydgia common over rocks, some very large ones among them. Got only one or two poor specimens.

Came back to church. Services going on, finished, most people filed out. F. wanted drink; we went across park for ? Urugayo Club was dancing. Back in park fellow was speaching and two bands alternated. Couldn't buy any pictures. But, unlike Rio Negro, most came in autos. Sandy dunes, houses with thick thatch. Can almost tell part of country by percentage of house tops. Light at Punta del Este = Maldonado Light. Camera got 1 bump and 1 drop today, both in case fortunately.

Said Caramba when I told him I was not going to be in Washington.

Water samples at about 3.33, tide just after turn, turn well marked.

Broke thermometer.

Told Metcalf he had learned English in last three months, and that I was sure H.M. Smith had written he knew no English. Metcalf said, "Why, he doesn't know any now." Good of him to try, and when you write it and make him read it, he gets it. On train Fel. couldn't stay in seat, crowded as dickens. Seat hogs. Train was due to start back at six, hasn't started yet at 7 p.m.

Beer 50¢                      Boy 20¢

Auto 60¢                      Other 30¢

Auto 1.00 round trip, myself.

Bacon Scholarship - Continued

Sta. #56, Punta del Este - continued

About Montevideo on way to Maldonado:

Country is like Kansas prairies, flat and undulating, but very nice and green, and, though flat, well watered. Trees appear in clumps (groves) and may have been just planted. People, the common people, seem more upstanding than run of Brazilians, or do I imagine it?

Felippone is Italian, of what did he say, 18 years here? Old sea captain was out, has bridge on house.

Day hot as blazes.

Boys and many men run around all day with long linen dusters or smocks of duck.

#57, Nov. 16, 1925

Returned to hotel from Maldonado at 11.30, left again at 12.30 for trawler. Net was put over in a.m., but I was sleeping too soundly. At hotel night before I only slept from 2.00 to 4.35, didn't wake me until 25 mins. of 4, so I am thankful I did lose sleep nightbefore, shave and everything before I went to bed. It made me miss a couple of good townet hauls in a.m.

Very large haul of this about 3 times what I saw on Friday last. Saved 1 doz. C ? , ratfish. Little else but Corvina and Pescadilla.

#57, no temp. taken. Air ? 9.00 a.m.

Second good haul only 1/3 size of first, both one right after other. Water sample saved. Bottom five arms reach, muddy 5 fms. H.I. about 9 a.m. Ph. 8.4, good test.

Notes on stomach contents: speckled shark?, fishes, skates, worms, Pescadilla, small squalid and Pompillo = Pasiphaea, Corvina = shells.

#57, Density 70.°5 or 6, 1011.1.

## Bacon Scholarship - Continued

Sta. #57, Nov. 16, 1925 - Continued

Moray had 1 big Pescadilla inside, 29 cm. long. Small flat shark saved had shrimp inside. Pescadilla same; Tremoleras tells me they glut themselves with herring sardines in season. Corvina eat shells, like ratfish. Palometa eat shrimp. Skate, worms of which, a few fragments, were saved.

#57 applies to two hauls.

When I hauled Chimaeras out of ice (out of box packed in ice) on one of large ones found two pieces of what I thought was skin around mouth, thought membrane of lips or lining of mouth had sloughed off. Forward of wastebasket had thrown it to one side, later when I got to bottom of box realized when I saw another in ice that they were parasitic worms. When alive were thinner and longer but no narrower, semi transparent (= translucent) with opaque marks; made me think of pictures of "glass" larvae of eels. (Blue is from scrap of blue pencil on table.)

Sta. #58, Nov. 18, 1925. S.E. Ponton Paro Banco Ingles (approx. 13 mi.)

7.00 a.m. 7½ fms. Mud. Density 1012.10, 70.°5. Water green.

= Sta. #1 of Inst. Pesca for this day.

H.I. = 8.8. 530-6

Townet haul solid mass ctenophores, interfere with haul. From large shark took two isopods from hinder dorsal fin. Saved few fish. Pc. of alcyonarian came up.

## Bacon Scholarship - Continued

Sta. #59. Nov. 19, 1925. (#2) 9.00 a.m. S. Ponton Paro Banco Ingles  
(Approx 10 millas, 7 fms., mud bot. Air 20° Water 20°25.

Cut open number of dogfish. Got pinnotherid and worms and mollusk opercula and 1 young dog out of gravid female. Got two crabs, round and square, mollusk opercula out of another. Mollusk opercula, 2 isopods, and crab legs out of another. Saved Corvina stomach full of eggs. Pcs. Bryozoa off of otter board.

Pescadilla didn't have much of anything today; ditto sting ray and sea robin.

Sta. #60 (#3) 1.00 p.m. S. Ponton Paro Banco Ingles (approx. 15 millas) 8 fms.

Air 21° temp., water 20°.25. Barro.

Sta. #61 (#4) E. Ponton Paro Banco Ingles, 8½ brazas, barro.

Air 21°5, Water 20°5. Verde

Got two Corvina negra, one at first haul out of 2½ feet, long one at last haul 4 feet long.

Larger spotted sharks had much digested fish fragments in stomach of large fish in all but one. In none were fragments recognizable.

Sort of choppy on way back to Montevideo.

Sta. #62. Nov. 21, 1925. Punta Caneta.

4.30 p.m., few crabs and amphipods and isopods. Measurements in terms of lengths of yellow

Sta. #63. Nov. 24, 1925. (#1) Hora siete. E. Isla de Flores (approx 4 millas) sieta banas, barro. Air  $19^{\circ}$ , water  $20^{\circ}$ , Verde.

H.I. 8.41, Density 1013.9, Temp. 77.5 in lab.

5.45 - 6.30 a.m. townet; already too light. Water sample.

Shark 4-3/4' long, 1st gill slit 5/8 from snout, beginning of pectoral nearly  $7/8$ , beginning of dorsal 3/8, upper lobe of tail from base ~~1+1/3~~ <sup>1+1/2+1/3 of</sup> 1/4. Only one little dorsal. Animal grey black spotted, white below.

Sta. #64 (#2). Nov. 24, 1925. Hora nueve. N.E. Isla de Flores.

Approx 6 millas. Cinco brazas. Barro. Air  $20^{\circ}$ , Water  $20^{\circ}5$ . Verde

Put over oyster dredge twice at conclusion of otter trawl. Put over oyster dredge in 7 fms. for two 10-15 min. hauls. Got very soft mud, worm tubes, and clams, and 1 shrimp (Xiphopeneus).

Sta. #65, Nov. 25, 1925. Barro Santa Lucia, Uruguay. In grass ?

Water temp.  $22^{\circ}5$  C. 11.35 a.m. By boat house Ph. 76.5 3.53 p.m.

Density 1000.05, Temp.  $64^{\circ}$  F.

Sta. #66, Nov. 25, 1925. Barro Santa Lucia, Uruguay.

About rocks and roots of grasses 5.00 p.m.; few amphipods.

Sta. #67, Nov. 25, 1925. Barro Santa Lucia, Uruguay.

1st

Made about 4 boat dredge hauls in river channel below bridge. All same sort of stuff. Once (2nd haul up) when net was empty it had a couple of branches of dead trees just coated with barnacles, of which we saved a few sticks. One of these hauls had a number of flat grapsoids in them. The depth was between 3-4 meters. Water was very turbid and bottom was soft black ooze.

Nov. 27. Manuel Fernandez.

Thompson brought me in a few Aeglea and amphipods.

## Bacon Scholarship - Continued

Sta. #68, on trawler of Inst. de Pesca. Nov. 28, 1925.

Made tow net haul 4.55 - 5.10 a.m.

Time 7 o'clock (a.m., see #69)

Banco Arquimedes. 7 brazas. Bot. = barro.

Air 17<sup>o</sup>, water 18<sup>o</sup>5. Water color = barroso.

Sta. #69 (2) 9.00 a.m. Nov. 28, 1925.

Banco Arquimedes. 7 $\frac{1}{2}$  brazas, bot. = barro.

Air 17<sup>o</sup>, water 18<sup>o</sup>5. Water color barroso. Isopod on and dead shell with bryozoa.

Got moray and a pompano.

Sta. #70 (3). 11.00 a.m. Nov. 28, 1925.

7 $\frac{1}{2}$  brazas, bot. = barro. Banco Arquimedes.

Air 18<sup>o</sup>, Water 18<sup>o</sup>5. Water color barroso, very muddy.

Very rough day; Vogelsang sick in part.

Sta. #71. Dec. 1, 1925.

In little tributary to Arroyo Miguelete in the Prado. Tried to ~~xxx~~ catch big Aeglea with hoop net and meat, but caught only a little one. Main stream very muddy. Tributary clear and very shallow. Temp. of main stream 28<sup>o</sup>5 C. Got about 3 8-oz. bottles nearly full, all sizes, from medium to small, but large ones as they are said to exist I didn't find.

Went with Tremoleras. Aeglea thick under grass and debris in water, especially plentiful, probably due to luncheon meat remains thrown in stream by ~~xxxxx~~ picnickers.

Bacon Scholarship - Continued

Two largest grapsoids from Ilha Govenador, Aug. 27, 1925, backs a slaty black with cinereous markings and lavender gray splotches branchial region where thighs of hinder legs fold up over them, eyestalks and legs what I would call a mahogany red with black brown spots, thighs (meri) of all but last two pairs of legs with whitish spots, maybe pearl gray. Red is almost crimson X orange chrome, shading off in bases of to saturn red to primrose yellow, to nearly white.

Turned down part between eyestalks real dark deep red like eyestalks. Propodi of walking legs sort of ochre yellow as is All joints of legs of 3 small tawny except meri, which are color of back, this is more umber than in large specimens. Outer meri, not last two, with more white splotches than in large specimens.

Chelipeds colored same as in large ones. Under parts yellowish like hands, which color runs over to proximal half of underside of meri of walking legs and entire under side of chelipeds.



## Bacon Scholarship - Continued

Sta. #72. Dec. 4, 1925

2 tow-net hauls in flooded river at San Carlos, after night and day of rain. In fact, were made in rain. Hauls of about 8 min. ea. duration. Water muddy. Net at surface.

Sta. #73. Dec. 5, 1925.

Same place snail from side of ferry made of three row boats side by each. Post was fifty or more feet from water's edge and 3-4 feet above level. This a.m. water was to foot of post. Crab caught on bait and hook. He said water was fresh, but that he had drowned crabs in bucket of fresh water. He didn't say drowned; he said they died of cold in can of fresh water and pressing question about fresh vs. salt water in stream he said sometimes ~~ex~~ soap would work for washerwomen and that at times of (high?) flood in ocean salt water came up. However, 1/2 mile below town crabs were in great number. Aeglea is the usual crab here, the grapsoids being rare. He was trying to get f.w. fish yesterday and didn't catch a one, just the grapsoids. Thomsen thinks f.w. in flooding of river rushing down channel pushed salt water to sides where man ~~was~~ was fishing with hook, line, and bamboo pole. No doubt people here ought to watch tide. They notice rise and fall of water but seem to wash and fish without reference to it. If they watched tides and fished and washed on ebb they would have better luck. No salt fish here so far as we know. Saw seine.

Sta. #74. Rocha

Got a few isopods from under bark on fence posts and few water bugs from step of corner door of hotel in alcohol.

## Bacon Scholarship - Continued

Sta. #75. Dec. 6, 1925.

Density, 1024 @ 74.<sup>o</sup>5 F.

Collected along rocks ~~and~~ along shore between Hotel and lighthouse. Got a number of things, but no shrimps--crabs, amphipods, and isopods, some sea anemones, and mollusks. ~~(Gave boy 20¢.)~~ (Gave boy 20¢.)

Visited school teacher, Carmen Branco. Has fine collection of local forms and other things. Has received nice collection of S.A. shells Tierra del Fuego and West Coast. S. A. from Museum in exchange. Promised send duplicates of specimens to us for bottles and alcohol. Good contact to keep. Knows local collecting grounds.

Temp. air and water each and both about 4 p.m. 19<sup>o</sup> C.

Sta. #76. 9.00 p.m.

Tow net haul from pier, near hotel Gamba. Few drags and verticals, combined, full of isopods.

Sta. #77

Later, to compare what might be along beach, went out in surf, but had to stop on account of debris and sand in water. Thought net would burst.

Same sort of material as in #76. 9.45 p.m.

Got chills and looseness as result of the above haul; better in a.m.

Sta. #78. Dec. 6, 1925.

Density 1024.1 @ 74.<sup>o</sup>5 F.

Opposite side of bay, point of land off yesterday's collecting. Got fine lot of amphipods. Water 18.5, Air 19. Little else but junk.

Bacon Scholarship - Continued

Sta. #79. Dec. 7, 1925.

West of lighthouse. Nothing much but beach shells. Surf too high.

Temp. air 19°, water 19°.

3 frogs from backwater pool

12 amphipods collected by Thomsen.

Density 1024 @ 74.05.

Some ? fossils ? from ?

Barnacles ditto.

Sta. #80, Dec. 10, 1925. Thursday

Crayfishes from General Bassanos place.

Some bumps on bark?? Flatworms.

Sta. #81, Dec. 11, 1925

Carrasco Creek with Felippone. Car past Union to end of post auto route on Camino Carrasco beyond concrete bridge. One toad in adjacent dry sand field where young eucalyptus grove has started, trees 6-7 feet high.

Sta. #82 Dec. 25, 1925

Dr. Doello Jurado took me to Tigre, to Isla Flores, to do some collecting in one of the tributary sloughs. We tried the main stream and the two laterals, one on either side of the island. Got some mussels and snails, a couple of fish, few Aeglea, and 3 larger and a number of smaller shrimps.

No end of pleasure craft, mostly belonging to the Argentine Yacht Club. \$1,000 entrance fee, and a big waiting list.

Station Data

2-26 ✓

17-26 ✓

67-27 ✓

Patria 49

(Argentine vessel)

473-34 ?

35?

48  
48  
WALDO L. SCHMITT

Bacon Scholarship

Aug. 1926 - May 1927

Cans from Guayaquil:

- #1. From Salinas and Punta Santa Elena, Sept. 1926.
- #2. Land crabs are in bundles as sold in market.  
Crabs purchased in "Mercado del Sur" Guayaquil, Sept. 21 & 22, 1926.
- #3. Fish and crabs purchased in market, Guayaquil.  
Crabs, Sept. 22, 1926; fish purchased Sept. 23, 1926.
- #4. Stuff from Salinas, plus two spiny lobsters purchased from man on board Cypress at Guayaquil, Sept. [1926.]  
Guayaquil,

Bacon scholarship has enabled me to live again the pleasures and aspirations that must have guided Stimpson, John Xantus, and others who contributed so largely to our knowledge of the invertebrates of America. Here at Paita alone I have found five if not six shrimps not obtained by Dr. Coker, and a Menippe and a Cancer not appearing in his collection. Of course one meets with many disappointments, particularly as regards fishermen.

Chimbote, Peru, should be collected.

Here at Paita they speak of a Langostina much smaller, which they say is quite different from the Langosta.

In Ecuador the one spiny lobster fisherman I was able to get to catch me some looked for specimens without a water glass, dropped a casting net over them and then dove over to bring them up.

Here in Paita, Peru, the water is always roily it seems, and the men go out among the rocks and feel around under them, and pull them out. The result is they get mostly small ones. Or else [they] put a seine around the rocks and by poking around them with an oar try to scare the lobsters in the net.

Aug. 29, 1926.

Made a few miscellaneous beach pick-ups here while steamer stopped.

Talara. Peru.

Collections 1-3, Sept. 12-14, 1926. )  
 " 1-4, Sept. 12-15, 1926. ) Lumped to save bottles.

#1-3

Xanthids from under rocks and in worm galleries. Lots lumped together.  
 5 bottles.

#1-3

Hyppolytidae from tide pools caught with <sup>wire</sup> small/hand net. 1 bottle.

#1-3

Porcellanids from under rock and in worm galleries, lumped together, 1 bottle.

#1-4

Odds and ends of mollusks, 1 bottle.

#1-4.

Hermits, 2 bottles.

#1-4

Tidepool fishes, 1 bottle.

#1-3

Misc. Grapsoids, 1 bottle.

#1-4

Worm galleries, few saved portions. 1 qt. jar.

#1-3

Algae, 1 qt. jar. Formol.

Monday, Sept. [4] 1926. First Monday in Guayaquil.

Shrimp from market. Faint buff pink tinge to vinaceous buff, to merest pea green speckled with china blue, nearly vinaceous cinnamon. Chelipeds of larger Berlin or marine blue on upper side, cobalt blue below; felt on fingers, blackish slate-olive; midriff of rostrum marked with brick red speckling. Tail fan of larger bluish (sea or myrtle greenish), greenish (olive x indigo), or brownish speckled; dark = dragons blood red, gallstone yellow along edge of smaller like abdomen. Articulations of legs except prod-dact. marked with orange rufous. Chelae of medium sized ones dragons blood red speckled edged with marine blue on outside, inside, and slightly below.

#1. Salinas, Ecuador, Sept. 12. 1926. Sunday.

Alpheid black cross striped on abdomen and carapace, legs speckled with brick red, giving them a faintly purplish appearance to naked eye. Chelae bottle green behind, becoming almost black toward and on fingers, extreme tips of smaller fingers orange. Eggs seal brown.

blackish  
speckled

x porcelain white  
suffused with flesh tint pale

Tiny xanthid with color noted shrimps. Carapace black with white markings, legs china white, fingers of chelipeds russet, propodi and carpi of 2 & 3 legs bistre? Also some indications of clay color along with white markings on carapace.

Larger of 3 petrolisthes, dark black bottle green with tiny punctae <sup>or</sup> of fleckings in seeming depressions on back, china blue. Median porcelain largely tawny olive x mummy brown mottled. chela more greenish sort of olive greenish.

Salinas, Ecuador. Sunday, Sept. 12, 1926.

Kelp color tawny olive marked with reddish (brick red X chestnut) spots.  
Small one (Nautocaris?).

Hippolyte, 5 sp. with above. very pale pea green marked with rows of blue-black (black end of myrtle green) spots.

Propodal carpal joint red or orange spotted, on eyestalk, too, and thick basal part of antenna. Red or orange equal either touch of more reddish cadmium orange or the bright red lower corner of claret brown. One shrimp will be one, one the other.

Two spider crabs, Epialtus like. Larger about inch long, more or less dark kelp color, marked with purplish splotches color of light purplish-pink nullipores, inverted shield-shaped patch in middle of back, smaller one behind it. Smaller about 1/2 long, lighter kelp colored.  
Small lumpy spider crab, wet purplish nullipore color above.



toward orange rufous on cutting edges, extreme tips and larger teeth whitish. Under parts plumbeous, carpi of ambulatory legs clove brown.

Petrolisthes with above are dark olive X bottle green speckled and mottled with sage and pea green, propodi of ambulatory legs with band of whitish pea green at either end, carpus with fleck of same on middle of upper side. likewise dactyl just before corneous claw. inner base of movable finger of chela with brilliant spot of orange chrome not visible when chela is closed.

Female fiddler carapace with regular pattern of olive <sup>ground</sup> ~~grown~~ with lighter areas wood brown. Corneae and stalks olive. Legs and chelipeds and chelae alternately banded with ochraceous buff X cream buff.

Smallest of three Macrocoeloma was taken this second day, other two on 12th. Carapace and legs orange rufous X saturn orange tinged with greenish toward central part of carapace; chelae and their carpi and basal half of propodi blackish clove brown; distal half of dactyli dirty, but still uniform white.

Crangon in with crabs blackish and white (translucent-transparent) cross banded (black stripes a sort of indigo blue). Chelae with much the same, only bluer ground color, and whitish speckled. Movable finger white with touch of salmon or pale orange at junction of blue and white.

Largest Portunid. back olive X olive green. speckled with bice green, transverse ridges dark blue (berlin blue). Teeth of antero lateral margin marked with Paris blue, legs striped with same. ventral hair fringe on legs and around paddles chinese orange. Fingers of chelae almost black claret brown. lowest outer ridge porcelain white, as are transverse ridges on lower margin. Two outer and two upper ridges dark and light blue as on carapace

between spines ochraceous. Tips and middle of upper surface of movable fingers with spot, inner ridges of hand like fingers but with whitish speckling near articulation, on inner side stains of crimson. Paddles color of hair fringes with ridges tinged with bluish, which looks greenish. Small specimens more drab, a light (sort of ochre, muddy) yellow.

Small Xanthids (*Eurypanopeus planus*) range in color from indigo blue X slate, really more slate color, to sepia X seal brown. All are variously mottled with little lighter speckles, olive buff or pearl blue as crabs are brownish or bluish. In brown or drab crabs lower half of outer face of chela is porcelain white with china blue tinge, of blue backed crabs is more purplish, between hyacinth blue and royal purple tinged.

Rough Xanthids (*Leptodius taboganus*) are more of a sage greenish, general [ly] mottled with some lighter traces of pea greenish.

Out on outer edge of reef saw more ascidians than I ever expect to see anywhere, literally the rocks were covered and carpeted with them, you trod upon them at every step.

Large hermit. chela malachite chromium green, edged behind and on proximal half of the sides with cadmium yellow X cadmium orange. Distal half of chela and cutting edge of fingers yellow becomes worn of more or less and white takes its place. No yellow at all on cutting edges except hairs on inner side of movable finger. Small claw green tips, orange fingers with olive tinge. Legs like smaller antennular scales, cadmium orange.

Smaller specimen has joints of cheliped similarly edged and whitish edges distally, chela shiny clove brown. Tips of fingers orange, edges of tips white. Legs like chela in color, dactyls with orange band just before dark corneous claw, only yellow for about distal 1/5 of dactyl.

#3. Salinas, Sept. 14, 1926.

Collected over reef again, in particular in morning. Broke open one of the worm burrows and got a lot of Crangons (3 kinds), Eriphias, Petrolishtes, tiny grapsoids, occasional Pachygrapsus.

Tiniest, or smallest now, of the four Macrocoelomas is a slate grey all ~~ixerexubekyduy~~ over, including legs, except for distal half of dactyls white.

Two more squillas taken this day placed with others, almost a black bottle green. legs tawny ochraceous, antennae and scale and outer margin of pleopod<sup>s</sup> the same. and rami of tail fan. but spine is bright French blue, dactyls of chelae china blue. Few white flecks on back. Have seen only this one species of Squilla so far, all are pretty much of the same coloration.

Two Crangons from worm [burrows] green speckled all over, hairs fringing tail fan ochre yellow. Small one without chelae (chelae are probably in jar with other Crangons of this date). Parrot green as speckles are very dark and close together, larger specimen more apple green, because speckles are wider separated, showing more yellowish ground color. Chelae french green. notches white and white band across middle of palm. ~~distallyx~~ Distal third of movable finger dirty whitish.

One Crangon in bottle with worm more or less burnt umber, blacker on dorsum of abdomen and basal part of fingers, tips of both fingers whitish, hairs of tail fan ochre yellow.

Got a nice lot of Balanus tintinabulum from Cable Sta. pipe line. Other barnacles from rocks where most collecting was done.

#3a.

While walking on beach at night got 4 Ocypodes. During the day they are rarely seen, but at night the place is alive with them. Used flashlight, without which it would not have been possible to follow them.

~~(3) Salinas, Sept. 14, 1926.~~

#4

Got a lot of lobsters from fisherman. After pickling them went out on reef, got a few more things like previous days (Crangons referred to here particularly). Collected more of the Xanthids from under rocks in order to get as complete a series as possible. Got three Ocypodes from beach between rocks from what was surely below high tide level. Didn't know they built galleries there.

Finally succeeded in digging up another worm tube. Failed to get whole tube, but was lucky enough to get a worm. There are two tubes in bottles of I think separate worms. The longer ended in a mollusk hole in a rock and I could not get it all out.

#4. Salinas, Sept. 15, 1926.

"Billy" picked up a beautiful large Calappa on the beach. Markings and bandings on joints of legs deep maroon X crimson, with bright naples yellow between chelipeds and carapace, auricular purple carapace finely speckled and scatteringly with primrose to straw yellow. Chelipeds splotchy with yellow and purple. Dug number of Ocypodes [on] beach. Color varies from a deep mummy brown X primrose yellow in most specimens to a dragon's blood red carapace X poppy red with almost nearly pinkish vinaceous on legs, mixed with the other red. The yellow markings are chrome yellow.

Temp. 26° C. Tide ebbing 12.30 p.m. Water sample 1025 (Greiner),  
temp. 70° Rosen temp.

#5. Sept. 16, 1926.

Crossed peninsula to south side of Point Santa Elena, but water was very rough (open ocean) and consequently got very little. Some smaller Grapsus grapsus, larger ones couldn't catch over the slippery rocks. Got a few echinoderms. two yellow and black water snakes, and two tiny Calappid crabs bright orange (or salmon) red, some bryozoa and seaweeds, and a couple of shells. Fisherman brought in a large shell from off Salinas.

Fisherman brought me:

1 = straw yellow

— stripe = pale blue

Corneous tip. Last lateral

pale blue. Now yellow instead of blue.

Green on all = bottle green.

Somites sort of olive X sage green mixed, or myrtle X bottle green. Carapace much same but with a heliotrope purple tinge.

Legs striped with yellow, maroon, and clove brown, underside between dull <sup>red</sup> and orange and orange. Spines on three basal antennal joints.

Soft part of tail fan bistre X raw umber, edged with yellow.

Antennae seal brown with naples X straw yellow splotches about 3 inches apart and inch long. Antennules almost black claret brown, straw yellow inch long splotches with red between dark of flagella nad yellow red - poppy red.

#5. See notes interspersed accidentally with #4. #5a below.

#5

4:30 tide rising, temp. 26° C. Salinity 1025, Scant., Temp. 68° F.

#5 specimens mostly from tide pools.

Two tiny Calappids from south side of Santa Elena Point found under brown sea anemones. Legs bright orange vermillion, underparts ditto. Carapace bay X madder brown areolations with suggestion of the vermillion but slight, chelae outside like carapace, inside orange vermillion with white bar at distal end of carpus and white spot at articulation of movable finger. Eyestalks dirty white (due to fuzz?), cornea a tiny brown ( ) spot on end. Distal half of dactyls white except for corneous tip.

Got two "water snakes" apparently in an exhausted condition up on beach where seemingly they had been left by the receding tide. Fingers of chelipeds fawn in one and almost hazel in the other.

Markings on body of snakes between cadmium yellow and deep chrome fading out to chrome yellow on tail.

Scarlet vermillion X orange chrome tending toward orange chrome on back.

Blotch on back blackish seal brown X chocolate.

#5a.

Fisherman brought me a large shell, taken while fishing for lobsters.

#6. Salinas, Sept. 17. 1926.

Hippas from beach. Mouse grey X olive on darker parts, mouse grey or lighter between ridges whitish and white below tinged with flesh color.

Got 3 fish from fisherman and Gecarcinus from kid.

#6.

Boy brought in some Portunids I hadn't gotten myself. Color was approximately between bice, chromium, and sage green, rather uniform on one of them. Chelipeds and legs bluish, quite a cerulean blue. Chelipeds above in formalin now for about three days (my first chance to get at them) are about a heliotrop~~e~~ purple with some suggestions of auricula purple.

#7. Sept. 17, 1926.

Last minute grab for seaweeds, etc. South side of Santa Elena Pt. Got a number of spider crabs about color of red coralline algae and from worm (sand) colony more Porcellanids. Got two tiny Pontonids, one of which had lost claws. Translucent milky white with stomach principally and alimentary tract partly vinaceous cinnamon in book. And one large hippolytid apple green. particularly the eggs (from coarse sand between rocks), and two sand burrowing fish.

Moving big rock and examining puddles formed underneath and found the three shrimps mentioned above uncovered by the sand from sides of depression falling into it. One little shrimp found wedged in bottle cap of one of these 17th bottles could not have come from elsewhere because of red rubber ~~cap~~ put in at home.

Sept. 21, visited market again. Bought two bundles of Ucides, chiefly for duplicate purposes.

Ucides eyestalks brilliant scarlet vermillion (orbits and margins above the yellow). Below lateral margin carapace orange ochraceous. Above may be uniform olive X sage green X olive green or the yellow with more or less oil green on higher bowed-up portion. Chelipeds mauve X heliotrope, spines light corneous, those on merus rather whitish below corneous tip. Cutting



surfaces whitish, more grey than with purplish tinge. Legs pink and red, propodus and carpus like chelipeds above and behind burnt carmine X geranium pink before and below, merus above and behind distally purplish <sup>shading</sup> ~~sading~~ into almost pomegranate X wine purple, behind and above, before and inside like carpus and propodus. Under parts are demarked hinder margin of carapace. Under parts more scarlet and between scarlet and color of eyestalks.

The way the crabs are tied together is very wonderful. One can carry a bundle of about 9 each with a cord in the hand. Crabs are sold alive as are shrimps.

Sept. 22.

Swimming crab at market.

Sept. 23.

#8. Oct. 1 & 2, 1926. Salada mangroves.

Visited Salada, Guaquil, early in a.m. Low tide, got crabs, Crangons and few other Macrura, 2 amphipods, and worms, Porcellanids, and some fish. all from digging through mud of mangrove swamp. Got terribly bitten up with tiny flies, still have terribly itchy lumps here on the 15th of October. Can scarcely sleep for scratching.

Oct. 4. <sup>Paiza, Peru. dining</sup> Night in hotel room, got two ~~in Paiza, Peru.~~ Dining beetles.

Water sample #8. Salada, Guaquil, Ecuador. Low tide (Oct. 1/26) density 1019, temp. at time in room  $77\frac{1}{2}^{\circ}$  F.

#9. October 6. 1926.

First point of rocks north of R.R. Sta., Paita, low tide 6-8-12 a.m.

Amphipods, tiny shrimp, couple of hermits, spiders, and grapsoids. Xanthids. Got a beetle from under rock in moist seaweed, salt water. All crabs small, same seaweed and few small urchins and couple of Solasters. 2 megalops, 2 fish, and frags. of bryozoa, few shells, 1 octopus, small. Tiny shrimps from seaweed kelp green to seal brown when alive; some had narrow white stripe down middle of back.

#10. Oct. 7. Some dredging.

1 Dromidia under rock sepia X clove brown almost. Unfelted fingers almost scarlet.

Sicyonia.

*Most of rest a Pinkish band.*  
Darkish bice green X olive green, epimera

and tail fan, including telson, flesh color legs same. antennae banded white and green.

Single crangon under rock, white stripe down middle of back. Generally a bistre X tawny tinge. Fresh dead = slate grey, either time finely speckled with whitish. Antennae orange rufous.

#11. Oct. 8, 1926.

Second day of dredging N. of where R.R. leaves coastal cliffs, 10-15 feet water. 2 Hippolyssmatas from underside of rocks suddenly lifted up. Well to north of Paita Langosta ground.

Design worked out in crimson, flagella, legs, and scales edged (?) with orange vermillion, corneae black.

Macrobrachium or palaemon from tide pool. Transparent ~~strip~~ longitud. and dia. striped with rows of clove brown spots.

Articulations of legs with spot of scarlet, ditto at articulation of outer pleopods.

Uroptychus on alcyonarian same whitish with flesh and pale purplish (olive grey, but little) suffusions on an alcyonarian. On others were a madder brown speckled with whitish.

Shield shaped white spot in middle of back with tawny center. Legs and chelipeds somewhat banded with white.



#12. Oct. 9, 1926

Personally collected south of Paita, but got very little. Fishermen brought me 2 Cancers, few hermits, and some shells. White. sparsely haired hermit had hands, dactyli. under parts. and distal half about of propodus of legs and carpus of chelipeds cream-buff with a sort of olive striping.

Paguristes

Other with felted hand = Clibanarius. Pubescence muddy. Ant. portion of carapace under hairs about lilac. Eyestalks and upper side of antennular peduncles indigo or Berlin blue. Last 3 joints of 3rd max. china blue.

Temp. water.  $17.8^{\circ}$  C. Density  $1026\frac{1}{2}$ , Temp. at time  $21.1^{\circ}$  C.

#12a. Oct. 13 1926

Misc. from rock pools south of Paita. Personal. Very little, but got a white Pinnixa in worm tube and small fish.

#13. Oct. 14, 1926. Paita, Peru

Few shells, large hermit, and small Petrolisthes from fisherman. Legs and hinder part of carapace tawny olive (but darker), shading into walnut brown on hands.

China white, almost speckled  
with brown

buff edging tawny ochraceous

Legs barred with whitish

#14. Oct. 18, 1926 Salaverry, Peru

Collections from surfbeaten shore. Couldn't get much as old clothes were locked in boxes in warehouse and inaccessible.

Yesterday afternoon got skull at Chimu and couple of thigh bones.

#15 Oct. 19, 1926.

Low tide. Over rocks along shore south of Pier, Salaverry Peru, as on 18th.

Water temp. Therm. #1  $15\frac{1}{2}^{\circ}$  C.

In digging out worm galleries got two *Pachycheles* and some small Xanthids.

Of course *Grapsus grapsus* is everywhere. Saw a light colored one, legs light tan with purple mottlings on carapace. Got a similar one at Paita, I think it was.

There are some isopods in worm galleries.

Got a lot of Hippas and shells on beach south of Point.

Water sample 9.30 a.m. rock pool, low tide. Water density  $1026\frac{1}{2}$ , temp. at  $19.15^{\circ}$  C.

*Pilumnoides perlatus*. Greater part greenish mud color, color of worm galleries largely (where found). Legs burnt sienna X vinaceous-rufous, with whitish near joints. Chela between rows of tubercles china white distally, but mostly pearl grey. Tubercles in rows vinaceous rufous, apices white. two large tubercles at articulation of movable finger almost lake red and also ground immediately around there basis, apices white, fingers almost black bay. lighter toward extreme tips, which are white.

*Pachycheles*, left hand larger = dark olive green x bottle green, and sage green, a little mottled. Hands mud color, color of worm galleries like *Pilumnoids*. Right hand larger, almost wholly dirty white, central parts of carapace with touches of sage green.

Alcohol added to sea water caused little holothurian to give off beautiful berlin blue.

#16, Oct. 20, 1926.

Collected in Rio Moche between Trujillo and Salaverry. Got no end of smaller shrimps, and lot of large M. jamaicense? though large hand strikes me as very swollen. Striped (longitudinally) Atyas are color of Brazilian São Sebastião specimens, but a few were barred transversely.

Largest shrimp of my collection, M. jamaicense, was bluish (dark) with reddish markings, color like Brazilian specimens.

#16 Barred Atyas



#17. Oct. 21, 1926. On wreckage off beach in front of Agencies warehouse, Salaverry. Peru.

Missed what looked like a Synalpheus (greenish cream color, pink hand) and a black transverse barred Crangon. Got one, however, that is top and upper half of sides of carapace clove brown with a suggestion of olive green, ditto for top, of first 3 and half of dorsum, of 4th abdominal somites; fingers and distal portion of large chela the same. Sides of carapace and side and hinder body behind 4th somite pinkish vinaceous. Large chela transparent wine purple, smaller chela like sides of body, fingers brownish, somewhat like fingers of larger hand, legs <sup>a</sup>trns. with ? suggestion of peach blossom pink, very little on upper and outer margins.

Callinectes from seine by men and boys. Two men for lot 50¢. Number of men and boys were in surf run-off collecting crabs. Collect[ed] spotted color as in earlier notes? All were dark of sage green speckled with whitish = ? palest olive buff. Ground color is darkest margining speckles. Movable finger bluish darker (almost) tinged with sea green above. Lower one with light slate on inside and sides, below pinkish vinaceous, white. Under parts, including outside of chela below last ridge white.

Got a few nice Callianassas, one large one nearly 6 inches in body. Live so far down need a balandra. ~~Density 1026.5~~ Water sample, density 1026.5, temp. at time 19°<sub>4</sub> slightly.

#18. Oct. 22. 1926.

Collected around wreckage (frags. of earlier pier cast up on beach).

Smaller stuff amphipods and small crabs combined with previous day's collection under #17.

Large crab under end of iron piling sticking in mud.

Cancer, color about burnt sienna, but with a considerable suggestion of claret brown, especially center of carapace. Chelae and legs darker parts of dragon's blood red, copiously marked and splotched with almost china white, often with a very pale cream buff tinge. Color runs into a prune purple on the dactyli of the ambulatory legs.

Large Xanthids. General color all over lying between pansy and Indian purple, fore half of carapace dark, approaching the black of pansy purple, hinder parts, washed out whitish between, more purple and lilac, but almost rose purple. Chelae beautiful dark of dahlia purple, punctae (reticulated depressions) a beautiful rich campanula blue each and every one on purple parts of hand, each one very distinct.

Large Crangon transparent, with greenish tinge. Alimentary tract in carapace parrot green, or is it ovaries. Hand prox. apple green, pale trans. distally ~~dark~~ dark, particularly fingers (black) parrot green. Everywhere speckled with carmine, gives green and whole animal a black ~~xxx~~ speckled look to naked eye. Antennal flagella apple green, cornea black. Space just behind each eye colorless. Joints and somites are outlined in the parrot green; red spots = chromatophores.

~~Smaller Crangon, general color pale wax yellow, margins of somites little darker~~

Smaller Crangon general color pale wax yellow, margins of somites little darker, large chela olive yellow distally and fingers oil green. Everywhere fine speckled with tiny red spots, crimson. Stomach tawny ochraceous, peduncles and antennal flagella same, but lighter, and transparent and tending toward pale yellow ochre.

#19. Oct. 23, 1926. A second afternoon of Rio Moche.

Got a large soft Macrobrachium (tawny ochraceous, brownish red all over mostly).

#20.

Patterson pulled up scrap when I was not here. Floyd Sears got me a few shrimp and one is surely one I haven't had.

Oct. 23 & 24.

Off pier old fender fram<sup>e</sup>s of railway rails pulled up from bottom, \_\_\_\_\_ feet of water.

Oct. 25, 1926.

Sunday - Thanksgiving dinner.

Oct. 26, 1926.

Arr. Callão.

#21. Oct. 31, 1926. Herradura

Water sample: Density 1022, temp.  $20.03^{\circ}$  C. Rising tide, 4.00 p.m.  
Water temp. from pool  $19^{\circ}$  C. near water's edge. Water so fresh that men were washing clothes in those particular pools, running water.

Just beyond Morro Solar. One bottle of algae from freshwater pool. Other bottle in ~~front~~ part from salt pool. Saved bottle from fresh pool especially because I inadvertently mixed other bottle.

#22. Nov. 1, 1926. San Lorenzo Id., Callão Bay, 2nd point to left of Naval Base, looking cityward. Temp. of water in tide puddle  $18^{\circ}$  C., density 1026.25 at 12 noon, temp.  $20.02^{\circ}$  C., rising tide.

Other Petrolisthes (some) are tawny olive to olive, chelae and forepart of carapace darker, some have sage green color to olive on chelae and forepart of carapace dark maroon purple marked with Nile blue, underside glaucous green grooves = tube feet cream buff.

Petrolisthes all among shingle of beach amphipods except Caprella ditto.

#23. Back again on San Lorenzo. Nov. 3, 1926

Water temp. 18.9° C, density 1026.5, temp. 20° C. even.

Collected to right of Naval Base looking toward Callão. Prize of day - two small Porcellanids on membrane around mouth of sea urchin. Only the two tiny ones on a dozen urchins. <sup>Only</sup> Two of the same appearance of species. I got Porcellanids off and the second of these was up high and dry on beach.

Little Cancer (Cycloxanthops sexdecimdentatus) dull white and around fore edge of carapace, anterior median part drab grey with touches of russet. Fingers of chelae like left, black end of mummy brown. Hinder part more lilac grey. Propodi and dactyli of first and second legs drab to raw umber, distal 3rd of dactyls white, dactyls of 3d legs with band of above color (drab to raw umber). hind, 4<sup>th</sup> legs all white.

#24. Sunday, Nov. 7, 1926

Dredge opposite passage between San Lorenzo and adjacent Island off 3 arch rocks. Dept between 20 & 30 feet.

Cycloxanthops purpureous. Carapace generally a dark prune purple to claret brown so dark that on higher parts of carapace it is almost black, ditto on antero lateral spines. Legs almost orange ochraceous X orange buff color.

Nov. 7, 1926 Sea 29 crabs *Callinectes purpuraceus*

Chelae lavender, lilac on superior margin and on prominent sup. spine on carapace and on smooth portions above, teeth on fingers white, as is tip of carpal spine. Bottoms or pits of reticulations rufous to ochraceous rufous in color (darker and more red than hind legs).

This groove almost cadmium orange.

*Hepatus chilensis* mottled with almost dahlia purple on carapace but surely auricula purple on legs. Larger specimen. carapace color is quite a brownish one, almost chocolate.

Of three small crabs bottled separately, spiny edge male grey to slate behind, I would call it bluish. Fingers almost black with whitish tips.

Other male almost seal brown, fingers burnt umber, fading out to whitish tips, chelae more hazel. ~~XXXXXXXXXX~~  
~~XXXXXXXXXX~~ Female more bay color on carapace. Single chela tawny, fingers a bit lighter, tips still lighter.

Off last two above. Abdomen mottled whitish bistre in particular with row of white spots down median line, first one on hind edge of carapace. This applies to part of abdomen visible from above.

*Pinnixa*, china white, rest of carapace and legs sand colored, chromium green, cream buff, and olive, all finely specked together. Eyes black. One other *Pinnixa* same color, still another more a tawny olive with whitish patches larger and more diffuse.

Black Porcellanid off sea urchin with lightish streak down middle line beginning at rostrum. Disappeared after being away from sea urchin a short time.

Water temp 17.<sup>o</sup>9 C. Water sample: Density 1026.5. temp. 20.<sup>o</sup>1 C.

#24a.

Bought a few shrimps in the market at Arica Nov. 13, 1926.

#25. Nov. 14. 1926. Tocopilla, Chile.

Collected around rocks south of oil refinery. Got a number of Betaeus. Most of them were generally a dark myrtle X bottle green. Largest and couple of smaller were olive X vandyke brown, in both overlapping edges were olive in green specimens (some almost black bottle green) and bay in brownish specimens.

Little Synalpheus, abdomen and tail fan ochre yellow, large chela pea green, fingers dark of sage green except light chitin colored tips, carapace between abdomen and hand in color. <sup>H</sup> Small alpheid with incised palm. generally translucent china white with blue (china blue) bands across abdomen occupying hinder 1/3 of each somite and band across telson, stomach dark olive, hands with "nuances" of sage green but very little of it, only on high parts.

Tiny hermits maroon. tips of fingers pure marble white, legs with white transverse markings.

Little white Porcellanid banded in middle of each leg joint with very black bay, practically clove brown. Carapace marked with both something like sketch. Chelae speckled.

#26. Nov. 15, 1926. Antofagasta, Chile.

Got a lot of small Epialtus out of corallines on rocky flat beyond Baño Municipal. No two colored alike.

Another was more reddish, sort of bay X claret brown and had practically no white on back, but pinkish marking, longitudinal areas of dark end of pinkish vinaceous. These are a different species? though legs look the same. Hind legs marked about same, first three pairs similar but with less white.

One hand white and also long pink marks.

Largest (*Pilumnoides perlatus*) rough of small Xanthids = dark bistre with two whitish areas either side of post. portion. Smaller Xanthid, almost black, clove brown carapace and legs, but chelipeds, except fingers, sort of lavender grey, fingers olive or bistre.

Large rough Porcellanids, *Petrolisthes*, sort of a deep red carmine purple black = black of prune purple. I guess, with minute touches of chinese orange here and there, really only noticeable on abdomen and hinder margins of meri, underside of chelipeds chinese orange. rest of legs and abdomen sort of lake red. Areas with dot pure china white, others coralline purple margined with purple = between phlox purple and wine purple. Ground color is ~~a nearly~~



is a nearly black claret brown or a black crimson, if that means anything to you. Legs with few lighter areas of purple on upper margins of joints with very little of white margining spots.

Dark, rough, large Porcellanids on under sides of large anemones mostly deep, rich green ones, and occasionally a bright orange one, but crabs showed no color differences.

Tiniest Xanthid white with merest suggestion of cream buff in ground color, with few flecks of cream buff down median line of carapace. Next to smallest Xanthid china white with black legs and eyes. Eyes jet black, legs more clove brown, dactyli and distal half of propodi pale translucent ochraceous buff, distal end of merus with whitish spot above, indeed where merus and carpus meet is white margined both sides of joining, but particularly on merus side, fingers of chelipeds, which are white as carapace, sort of vandyke brown, lower finger little lighter than upper, tips of fingers white.

#27. Nov. 16, 1926, at Chanaral, not far from smelting works, between works and first whitish point toward town. 10:30 a.m.

Light colored sea urchins. Female pinnotherid wood brown, carapace and chela, legs tawny olive.

Small Xanthid (*Acanthocyclus gayi*) dark black olive, lighter behind, suffused there with tawny olive, legs tawny olive, especially propodi, carpi, and meri dark, all articulations whitish, dactyl with black olive spot on upper margin. Under side and lower 2/3 of palms white.

~~#28 Monday, Nov. 29, 1926. First night out of Valpo, head west.~~

~~Tow #12 net. (28a scrapings from bottom of row boat hoisted on deck.)~~

#28. Monday, Nov. 29. First night out of Valpo, head west.

Tow #12 net. (28a = scrapings from bottom of rowboat hoisted on deck.)

Night, running slow. 8.10 - 8.20 p.m. Lot of salps, copepods, and at least one megalops, and a few "shrimp."

Nov. 30,

#29. Tuesday, ~~Dec 30~~, 1926. Morning after first night.

Tow #12 net. Becalmed, 6.50 - 7.15 a.m. Water luminous each night.

#30. Sunday, Dec. 5, 1926. 9.30 - 9.50 p.m.

Sighted Isla in distance and changed course toward<sup>15</sup> at 4.30 p.m. Headed on point (not degree) E. of S.E.

Little choppy, not much headway. #12 net.

#31. Monday Dec. 6. Same course as #30. 5.30 - 5/40 a.m.

Tow #12 net. Slow, not much wind. Shells looked black at night. In a.m. after night in 5% formalin campanula blue; first turn or two (apex) smalt blue.

#32.

Couple of hauls, 11 a.m. - 3 p.m. Tow #12 net. Flapping sails, water smooth.

#33. Monday, Dec. 6.

Almost calm, little wind. 10.20 - 10.30 tow #12 net. p.m.?

#34. Dec. 8, 1926. Rising tide, 6.30 - 7.00 a.m. Water ?

Along boulder covered beach to left of "factory" Juan Fernandez. Water temp. 17.2° C. Got a small Plagusia and had a young (tiny) transparent stomatopod in bottle with few other things, but lost sight of it on return, though I made a particular search through the bottle contents for it. Got a purplish Xanthid.

In vial, black grapsoid with broader meri and larger eyes is sort of clove brown with few gray specks on carapace and a similar colored mark near middle of hinder end. <sup>Above dotted</sup> Line ~~of~~ color of carapace below sort of dead white, finger tips light corneous color = pale ochre yellow or buff yellow.

Other grapsoid more or less olive with a suggestion of ochraceous.

Single Xanthid with black fingers has chelae mauve tending toward violet above. carapace is bay with "high lights" of maroon, legs bistre---vandyke brown.

(1) Smallest Xanthid in vial pepper & salt color, blackish and "bistre" white, contrasty. (2) Next smallest much like it but color of carapace more all one color. (3) Third from smallest has seal brown, nearly black, carapace and about same color hands above, but flushed in front with dark prune-purple, a splotch especially articulation of right hand, legs bistre, cross banded darker and lighter. Fingers bay color.

Other three Xanthids in same vial (1) largest much broken one burnt umber; (2) complete spec. more a seal brown. #(1) with mummy brown fingers and more or less brick red hands. #(2) sort of the dark of maroon purple to hazel, fingers decidedly hazel. Legs of both bistre.

Isopod bottled alone the only one of its color seen--half way between apple green and oil green, uniform color all over. A large isopod added was between orange vermillion and dark of Chinese orange in color; there are about 1/2 doz. of this color and kind in vial of saved isopods.

#34 - Cont.

Water samples: H.I. = 8.3, Density  $1025\frac{1}{2}$ , temp.  $20.08$  C.

#36

Acid 8.2, density 1025, temp.  $20.08$  C.

#38.

Temp, in sea  $18.0$  C. Density  $1025\frac{1}{2}$ , temp. at time  $20.01$  C., H.I. 8.2.

#35. Dec. 8. 1926.

Practically over to hill (all afternoon at spot. 2.45 until 4.30) on which wireless is. with Durand looking for a red mollusk he said was only found in the one place. On the way had some good luck in fresh water streams for Shoemaker in the shape of a lot of fresh water amphipods and a few terrestrial isopods. One land mollusk that fell in the water somewhere. There ought to be a few shrimp, seemed to me, but diligent looking failed to uncover them. The cone shells are much sought after here, saw a man and wife looking for some the other side of the factory on my return. Durand showed me the place.

#36. Dec. 9, 1926. Tide turned to rising. Water temp.  $18.0$  C., 7 a.m.

Between sand beach to right of cannery and first group of large rocks as far as wreck of iron steamer winch.

Isopods were taken where water of one of fresh water streams flowed down over beach, but place is covered at high tide and every wash of waves at low tide.

Water sample and temp. taken at this place.	(Density
	(
Temp. of water $18^{\circ}$ C.	(Temp.

Isopods slate colored, speckled with gray (next slate color) all segments and parts of tail fan margin with coral red margin as wide as this. — Antennae same color, eyes black, legs drab tinged with reddish, antennae more or less transparent. Rolling up of isopods may make them look like gravel among which they are found, but it makes them easy to take. Touch one ~~and~~ from below and almost every time he rolled up. Boulders and gravel were bluish and coarse sand of that color and mixed with reddish of color of margin almost more like old red sandstone. Very wonderfully protectively colored. Would not have been able to spot them had they not moved.

Plagusias, carapaces look between a dark olive green and sepia mixed, though fringes on propodi and dactyli are ochraceous buff, spines and tubercles all distally whitish to white at extreme tip basally crimson (faded out). Upper parts of chelipeds and bare places on upper parts of legs deep rich crimson, almost approach maroon in darkness.

#37. Dec. 10, 1926.

With Sr. Durand went dredging with row boat, but, between rocks and sand, got very little. Bottom is very rocky, where it isn't sandy. Made about six dips with bottom sampler in 10-20 fathoms. Temp. 18° C.

#38. Dec. 11, 1926, 6.30 - 9.00 a.m.

Sample taken at low tide, 7.20 a.m. Water temp. 18° C.

Around to last, impassable point of Cumberland Bay from cannery to right. Rocks soft pumice and as I was pounding one to pieces for what I might find I got a spider; surely is covered with high tide or just about; as it is, is constantly wet with spray and that is pretty severe at that. Evidence algae and chiton and one little shell. One can see the spider's nest in little piece of rock I chipped off containing nest. Got little else than a bucket of algae

and lot of amphipods from tide pool. Got a couple of tiny pholads and a tiny crab from among same group.

First real rough day, overcast, very windy. Yesterday overcast + 9th more or less clear, but 8th was an ideal, beautiful, clear, sunny day. first time. Pico Central and other tips were free of clouds.

#40. Dec. 13, 1926.

In yard of Sr. Charpentier got a lot of amphipods and isopods under some stones--first time I ever saw amphipods in such numbers on dry land. The habitat being just that of the isopods, which are strictly dry land (rather damp land) forms, and really damp only under stones and boards and woodpile where these were found.

Some snail shells, too.

#40a.

On way home the more rounded isopods were found in much drier locality, only rocks and dirt, no vegetation. Other stuff in localities similar to Charpentier's yard, in fact between it and dry ground.

Chonta Palm, 25-3/4 inches in circumference, about 4 feet from ground.

#40b. Dec. 14, 1926

Miscellaneous junk from grounds of Rene Durand, Dec. 14, 1926.

#41. Dec. 14, 1926.

Climbed to Lookout and collected a few land mollusks on way. Got an amphipod at top, 500 feet elevation about. 'way above spring level but almost in region of continual clouds three days out of five.

Largest amphipod in #41 proper came from below tablet at Selkirk's lookout, other stuff from nearly same level, ca. 500 ft. I'm told, check up on map.

#41a.

At two places between 150 and 250 feet, combined to same vial.

#42. Dec. 12, 1926

From fisherman, West Bay, Santa Clara Id. (off Juan Fernandez), 25 fms., chiefly bryozoa.

#43. Dec. 13, 1926.

From fisherman, taken at Father Bay, 30 fms., Juan Fernandez.

#44. Dec. 13, 1926.

From fisherman taken at Ancla - Vaquena 18 fms., Juan Fernandez.

#45. Dec. 13, 1926.

From fisherman, taken at Severina, 18 fms., Juan Fernandez.

#46. Wednesday, Dec. 15, 1926.

With fisherman, John Baupista Vera, went to Father Bay. Tried on dredge haul, but too rocky; got a piece of sponge and few scraps.

Water 18° C. at 12 noon. Used nets, got total of 115/(25 overboard).  
legal lobsters

	N.G.	Good
1st blank		
3rd net	13	2
4	?	1
5	<u>16</u>	5
6	6	10
7	12	5
8	12	4
9	9	<u>10</u>

37 plus five other nets; after

careful culling in boat again, 33 lobsters from 12 nets considered good.

Nets in water 3 hrs. 3 ft. dia., about 2½ ft. deep.

First set up at 12 noon after 3 hrs., 2 of which dredged in Carbajal Bay and 1/2 ashore. Set beginning up at 3 p.m. fewer small lobsters. After 4 nets quit at 3.45, back at 6.30 beginning again at first net, all finished and reset by 8.00 p.m.

Thursday a.m. up at 3.30 a.m., started lifting nets at 6.20 after 2 tows 10 min. ea. and breakfast. Last night tow 10 min. after 9 p.m.

This (16th) a.m. two 10 min. tows at 3.30. Water 18° C. at 6.45 a.m.

#47. Dec. 15, 1926. Carbajal Bay. 15-20 fms.

Munida dredged in Carbajal Bay specked with dragon's blood red, giving it that general color to eye. Ground color lighter? buff pink, some dead whitish inconspicuous spots along anterior margins of rugae.

Langosta puerulus? or older. Corneae clove brown. Antennae with about four larger flecks in basal half of primrose or straw yellow, more numerous small speckles of some joints of antennular peduncle and articulations of legs faintly marked with same color; antennae and flagella of antennules with faint pinkish or rather very very pale poppy red.



Got some algae and tiny brown Xanthid and lot of rock ~~hermits~~. <sup>otherwise,</sup> Dredging was a failure.

#48. Dec. 15. 1926. North Bay of Santa Clara Id.

Three or so large Grapsus. a handful of white shells, and lot of tidepool fish.

#49. Dec. 15. 1926.

10 minute townet haul, #12 net, from Father Bay out to and beyond entrance, between 9.00 and 9.30 p.m.

#50. Dec. 16, 1926.

Tow net haul, two dips of 10 min. each, over same ground, but between 3.30 and 4.00 a.m. Water sample taken at 6.45 a.m., water 18° C. H.I. between or either 8.1 or 8.2. Density 1026 $\frac{1}{2}$ , Temp. 17.°8 C.

Dec. 17. 1926.

Watched load lobsters. Lower layer 250 each in space 2 $\frac{1}{2}$  - 3 times size of bulk of lobsters. 100-200-300 may die enroute. Once Graviota had 1800 out of 3,000 die.

Afternoon to Guita de Robinson. Disappointing; wild horses and wild men.

Got 3 fish and starfish from Bay.

#51, morning of 18th. (Dec. 18. 1926)

Got jellyfish and stone from fisherman. Later a tiny crab grapsoid shape of Planes, but without hair on legs. Very pale smoke gray on carapace and lavender gray on legs, both finely speckled with black, giving whole crab at little distance a sort of drab gray color; mottled in places with what looks like a brown, or at least darker color.

#52. Dec. 17, 1926. Off Isla Santa Clara. 25 fms.

Brought in by fisherman on morning of 17th with two small lobsters, 1/2 or less size of regular ones.

#53. Dec. 17, 1926.

Medusa, ex) umbrella colorless and trans. with very few scattered flecks on and near marginal tentacles, otocysts and 4 gonads? violet. subumbrella lilac, long tentacle pale wine purple. Also a rock with shells, etc.

#54. Dec. 17, 1926. rock.

From fisherman, Juan Fernandez.

#55. Dec. 17, 1926. Bahia Cumberland. 20-10 fms. Boat dredging 3.30-4.30 p.m.

(Mala!) Motor wouldn't work after all arrangements had been made, engineer, Durand, Mayer , and I. Lot of work, vexation, and no results. Earlier at English Bay most disappoint<sup>ing</sup> place I ever saw, the Gruta. Just my luck to have the motor go wrong on about my last chance to dredge. All I got was shells, about 1 fish, and frags. of worms, bryozoa on seaweed.

Saturday, Dec. 18, 1926.

Good rainy day again. Photo'd engineer and family. Gave him English lesson.

#56. Sunday. Dec. 19, 1926. Seine hauls, 6.30-8.30.

Right after rain (at 7.30. rising tide) water temp. 17.<sup>o</sup>5 C., water 1½ fathoms, to beach on shore. Got about 7 Ovalipes and a lot of fish. Furel med. and smaller and Corbinetta? med. and smaller. All of the fish I have specimens of are represented here by much larger specimens; because of limited capacity of barrel saved only med. sized or small specimens of fish throughout.

Water sample: Temp. 17.<sup>o</sup>75 C., Density 1026.25, H.I. 8.2.

Off and on rain Sunday all day. Had few hrs. a.m. during seining and few p.m. within rain.

Large ♂<sup>n</sup> Ovalipes with eggs seal brown color of volcanic sand in some places here, spines sort of whitish.

blue very pale glaucous to Nile greenish blue.

Purple on legs more violet and more proximal

legs joints chelae and carapace prune

purple approaching or even tinged with

maroon, hind sides of legs sickly pale

bluish green.

#57. Dec. 20, 1926, Monday.

In a.m. just collected a lot of *Chapras* to eat, cap-shells (limpets), got 3/4 of a bucket full in couple of hours. Are just dropped in hot water for few minutes, after which fished out animal, shoves out of shell very easily with finger. Saw quite a number of *Plagusias* on outer fringe of rocks.

In afternoon had another seining party, got a few larger , some small smelt, and on first haul a nice lot of furel.

#58. Dec. 20, 1926.

Lot of *Pjerreys* saved, about 1/3 total quantity.

Tuesday, Dec. 21, 1926.

In ~~xxxx~~ early a.m. got 65 sea anemones to eat for tomorrow and 1 *Plagusia*.  
Rain every other hour.

#59. Wed., Dec. 22, 1926.

In a.m., 7.30 - 8.30, got a lot of *Plagusias* (14) feeding on algae. Some of algae in mouth of crabs put in with #58 above to save (no more bottles). No end of tiny amphipods ~~xxx~~ in those weed scraps, a few saved in last vial.

First large rock past sand beach to right, Wed. afternoon, collected a few more land shells and one sizable amphipod.

#60, Dec. 22, 1926

Tried streams for shrimp but no go. Only amphipods. From fisherman few pieces of antipatharian from farthest point of Santa Clara Id., taken Dec. 21, 1926. Said 60 fms.

Thursday, Dec. 23, 1926.

Got about half dozen sea anemones ~~for~~ for specimens for names. Dark brown-black ones are not used because too duro, tough and hard. Of the latter I've seen none here, but must be because Durand speaks of them.

Friday, Dec. 24, 1926.

Good heavy rain. Has rained more or less every day for past 5 days or more.

#61.

Shrimp hang around growth covered floats, but these are cleaned in November at beginning of season. just ahead of my arrival, so I didn't have much luck. With dip net secured two very tiny ones, Rhyncocinetes.

Gizzard shows sort of hair brown through yellow, no red spots on that part of carapace. Abdomen and branchial region of carapace with oblique crimson stripes, spots on rest of carapace about in two rows on a sulphur yellow ground extending on to basal 1/3 of rostrum. Distal lower part of rostrum canary yellow, opaque, sulphur yellow like dust, partly transparent. Red bar length of rostrum on each side of dorsal margin, more carmine, legs, carpus, propodus, and dactylus crimson on upper half, rest of somites to body colorless. Smaller specimen scarcely colored, red spot pale crimson? at base of each pleopod shows through epimera, legs with a few very tiny spots, scarcely perceptible, spot at articulation most noticeable. Antennules and telson and stomach palest, between lemon and citron yellow (neither, yet partaking of both).

Runs of Graviota to Isla Juan Fernandez, Nov. - Dec. 1926

Position at 12.00 noon

Nov. 29 - 30

39 mi.

Lat. 32 - 51 - 12 S.  
Long. 72 - 27 - 00 W.

Nov. 30 - Dec. 1

57 mi..

Lat. 32 - 36 - 00 S.  
Long. 73 - 39 - 00 W.

Dec. 1 - Dec. 2

78 mi.

Lat. 32 - 36 - 48 S.  
Long. 74 - 52 - 00 W.

Dec. 2 - Dec. 3.

91 mi.

Lat. 32 - 20 - 34 S.  
Long. 76 - 40 - 00 W.

Dec. 3 - Dec. 4

90 mi.

Lat. 32 - 35 - 40 S.  
Long. 78 - 24 - 00 W.

Dec. 4 - Dec. 5

75 mi.

Lat. 32 - 41 - 32 S.  
Long. 79 - 02 - 00 W.

Dec. 5 - Dec. 6

47 mi.

Lat. 32 - 58 - 38 S.  
Long. 79 - 36 - 05 W.

Dec. 7 Arrive at Bahia Cumberland about 11 a.m.

Lat.  
Long.

dub

## Return trip Graviota

Start about 12 noon, Dec. 27, 1926.

Position at 12 noon

Dec. 28 Tuesday

100 mi.

Lat. 33 - 28 - 21 S.

Long. 76 - 45 - 0 W.

Dec. 29 Wednesday (Water sample, see next page)

110 mi.

Lat. 33 - 31 - 20 S.

Long. 74 - 34 - 0 W. Saw piece of kelp go by.

8.00 a.m. Thursday - Captain said 27 miles off coast. Very foggy,

no chance to see land; no wind either.

Dec. 30, Thursday

130 mi.

Lat. 33 - 03 - 38 S.

Long. 72 - 03 - 00 W.

Arrive about 7.00 p.m., was 8.00 before got ashore and about 9.00 in  
my room after supper.





*duh 1189*

Runs of Graviota to Isla Juan Fernandez, Nov. - Dec. 1926

Position at 12.00 noon

Nov. 29 - 30

39 mi.

Lat. 32 - 51 - 12 S.  
Long. 72 - 27 - 00 W.

Nov. 30 - Dec. 1

57 mi..

Lat. 32 - 36 - 00 S.  
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78 mi.

Lat. 32 - 36 - 48 S.  
Long. 74 - 52 - 00 W.

Dec. 2 - Dec. 3.

91 mi.

Lat. 32 - 20 - 34 S.  
Long. 76 - 40 - 00 W.

Dec. 3 - Dec. 4

90 mi.

Lat. 32 - 35 - 40 S.  
Long. 78 - 24 - 00 W.

Dec. 4 - Dec. 5

75 mi.

Lat. 32 - 41 - 32 S.  
Long. 79 - 02 - 00 W.

Dec. 5 - Dec. 6

47 mi.

Lat. 32 - 58 - 38 S.  
Long. 79 - 36 - 05 W.

*Is this right?*

Dec. 7 Arrive at Bahia Cumberland about 11 a.m.

Lat.  
Long.

#62

Water sample at 12 noon. Wednesday. Ocean temp.  $18^{\circ}$  C.

In cabin at 1.30 p.m.: Density 1026 @  $19.04^{\circ}$  C., H.I. 8. and little more, but not nearer 8.1 than 8. As carpenter would say, 8 full.

Anemones thrived on Sal Carlsbad Crist.

#63. Collected at Torpederas, Valparaiso, Jan. 6, 1927.

(Alga collected this day was identified by Taylor Jan. 8, 1945 as *Porphyra* sp. (in too poor condition to determine species)),

Two largest Porcellanids and Xanthid (?) color noted.

Largest Porcellanid no chelae. Below azure to Sever's blue in darker parts. Above more indigo or marine blue.

Distal margins blue of all joints dark ochraceous rufous overlaid over the tiny hind legs about all this color over blue giving them nuances of color. Antennae seem maroon, or dark claret (brown?).

Other, next largest, Porcellanid more or less orange rufous below; above clove brown X olive green; at articulations showing almost orpiment or orange which also seems to touch up high spots of orange rufous below.

Xanthid largely olive above with markings on chela plum purple (= reticulations on upper half of chela).

Water sample. #64 Torpederos. 1026 @  $22.05^{\circ}$  C. H.I. 78.25 [7.83] (7.83)

#65. Jan. 27/27, Castillo. ~~Temp in water~~ 1026 @  $17.8^{\circ}$ , H.I. 7.83, Temp. in water  $13.8^{\circ}$ , bad weather.

#73. Feb. 2, 1927.

From under rocks, tide flats, west of town, Punta Arenas. Chile. Taken in morning, 7.00 - 9.00 a.m., tide high.

Water sample: Water  $9\frac{1}{2}^{\circ}$  C., 9.00 a.m. density 1024 =  $14.0^{\circ}$  C.,  
H.I. 7.9, high tide.

#74. Punta Arenas, Feb. 2. 1927

Over same ground west of town, low tide. 3--4--5 p.m.

#75. Feb. 3, 1927.

All beach at low tide, almost wholly on sand flats. Piojo, 6.30 - 7.30 p.m.  
Crabs; boys help.

#76. Feb. 4, 1927.

From fishermen, 2.00 - 5.00 a.m., on beach at 7.00 a.m. Debris from net used in centolla fishery.

#77. Friday evening. Punta Arenas.

On tide flats with Hardy (English boys). 6-7 p.m.

#78. Saturday, Feb. 5, 1927, Punta Arenas.

Picked up from large "trawl" net (like otter trawl without boards) lying on municipal, new concrete, pier. Whose net - must ask Pagels, maybe his.

#79. Port Stanley, Feb. 22, 1927.

Collected along sea wall, east of main pier. About 20 yds. of ground covered.

1 vial amphipods  
1 " unsorted debris.  
1 bot. 8 oz. Echinoderms and worms in vial  
1 " " Bryozoa, barnacles, and overflow shells - 2 limpets  
1 bot. 8 oz. mollusks.  
1 " " ascidians with vial of small ones containing  
2 shells homes of hermit crab, one has Bryozoa  
and other ascidians on it.  
1 vial crab  
1 vial = 2 hermits minus shells

#80. Wed. Feb. 23, 1927. High tide, 8.00 a.m.

Water temp.  $10.75^{\circ}$  C., H.I. 8.15, Density  $\frac{1026.5}{1025.5}$ , Temp.  $11.0^{\circ}$  C., 1-2 fms.  
Boat dredge over mud and broken shell bottom, 1-2 fm., short distance above  
hulk by Falkland Island Battle Monument.

#81. Feb. 23, 1927.

Boat dredge haul through kelp, 3 fms., clean haul, weeds, shells, and  
ascidians. Short distance <sup>above,</sup> west of hulk by Falkland Islands Battle Monument.

#82. Monday, Feb. 28, 1927. 10.00 a.m., rising after low tide.

Water sample: H.I. 8.2. Water temp.  $10.03^{\circ}$  C., density 1027, temp.  $10.05^{\circ}$  C.

#83. Feb. 28, 1927. 10.00 p.m.

Electric light off Falkland Id. Co.'s east pier near high tide.

#84. March 1, 1927. Tide 1/2 high.

West of Governor's landing, stony tide flat, 11-12 a.m.

#85. March 2, 1927.

Bottom sample. 4 fms. Choisel Sound below Port Darwin, Falklands, at  
about 12 midnight. two dips.

#86. March 3, 1927.

Tow net along pier, jetty at Port Howard, lower jetty, at about 12 midnight.  
Few amphipods.

#87. March 4, 1927

Bottom sample about 4 fms. Port Howard, Falklands. Heavy rain kept me from getting wireless man to do some dredging in motor boat for and with me.

WATER SAMPLES (Started from Deception Id.)

#1. March 5, 1927. 8.00 a.m.

Temp.  $7.^{\circ}15$  C., Density  $1027.3 \approx 48^{\circ}$ , H.I. (Sound)  $83.^{\circ}55$  more or less  
(82 mine)

#2. 12.00 noon.

Temp.  $7.^{\circ}05$  C, Density  $1027 = 48^{\circ}$ , H.I. 8.15 about.

Position, 12.00 noon: Lat. N.  $54^{\circ} 57' 00''$ , Long. W.  $59^{\circ}, 33', 00''$ .

#3. 4 p.m., March 5, 1927.

Temp.  $6.^{\circ}96$  C., Density  $1027 \approx 48^{\circ}$ , H.I. 8.2.

#4. 8.15 p.m. March 5, 1927

Temp.  $6.^{\circ}6$  C.

#5. 12.10 midnight, March 5-6, 1927.

Temp.  $6.^{\circ}8$  C.

#6. 8.00 a.m., March 6, 1927.

Temp.  $6.^{\circ}65$  C., H.I. 8.03.

#7. 12.00 noon, March 6, 1927.

Temp.  $5.^{\circ}8$  C., H.I. 7.95.

#8, 4.30 p.m., March 6.

Temp.  $4.^{\circ}2$  C., H.I. 8.0.

#9. 8.00 p.m., March 6, 1927.

Temp.  $2.^{\circ}65$  C.

#10. March 7, 1927. 12:15 midnight.

Temp.  $2.^{\circ}5$  C.

#11. March 7, 1927. 4.00 a.m.

Temp.  $2.^{\circ}1$  C.

#12. Mar. 7, 1927. 8.00 a.m.

Temp.  $2.^{\circ}1$  C., H.I. 7.85.

#37. March 7, 1927 12.00 noon

Temp.  $1.^{\circ}9$  (Mine  $2.^{\circ}8$  C.), H.I. 7.9.

#14. Mar. 7. 1927. 4.20 p.m.

Temp.  $1.^{\circ}08$  C. (Mine  $1.^{\circ}8$  C.). H.I. 7.85.

#15. Mar. 7, 1927 8.00 p.m.

Temp.  $0.^{\circ}8$  C.

#16. Mar. 7, 1927. 12.00 midnight.

Temp.  $0.^{\circ}8$ .  $0.^{\circ}7$  second and better dip.

#17. Mar. 8, 1927. 8.00 a.m. Thermometer #86014, N. 224, written on glass; printed

Temp.  $0.^{\circ}5$  C., H.I. 7.95. Snowing and ice on deck. on glass.

#18. Mar. 8, 1927. 12.00 noon.

Temp.  $0.^{\circ}6$  C.

#19. Mar. 10, 1927. 12.45 noon

Temp.  $0.^{\circ}9$  C.

#20. Mar. 10, 1927. 4.00 p.m.

Temp. 0.<sup>o</sup>85.

#21. Mar. 10, 1927. 8.00 p.m.

Temp. 1.<sup>o</sup>25

#22. Mar. 11, 1927. 5.00 a.m.

Temp. 2.<sup>o</sup>4 C.

#23. Mar. 11, 1927. 11.15 a.m.

Temp. 2.<sup>o</sup>52 C.

#24. Mar. 11, 1927. 4.30 p.m.

Temp. 2.<sup>o</sup>8

#25. Mar. 11, 1927. 8.00 p.m.

Temp. 3.<sup>o</sup>1 C.

#26. Mar. 12, 1927. 8.00 a.m.

Temp. 4.<sup>o</sup>05 C.

#27. Mar. 12, 1927. 12.00 noon.

Temp. 3.<sup>o</sup>4 C.

#28. Mar. 12, 1927. 4.00 p.m.

Temp. 6.<sup>o</sup>7 C.



#29. Mar. 12, 1927. 8.30 p.m.

Temp.  $8.^{\circ}15$  C.

#30. Mar. 12, 1927. 12.00 midnight

Temp.  $7.^{\circ}15$  C.

#31. Mar. 13, 1927. 8.00 a.m.

Temp.  $7.^{\circ}5$  C.

#32. Mar. 13, 1927. 12.00 noon.

Temp.  $7.^{\circ}6$  C.

#33. Mar. 13, 1927. 4.00 p.m.

Temp.  $8.^{\circ}8$  C.

Positions, 1927, 12.00 noon

Mar. 5, 1927

Lat.  $54^{\circ} 57'$

Long.  $59^{\circ} 33'$

Mar. 6, 1927

Lat.  $57^{\circ} 40'$

Long.  $58^{\circ} 51'$

Mar. 7, 1927

Lat.  $61^{\circ} 14'$

Long.  $57^{\circ} 30'$

Mar. 8, 1927

12.00 noon. 8 miles off Deception Id.

Mar. 10, 1927

10 miles off Greenwich Id.

Mar. 11, 1927

Mar. 12, 1927

Mar. 13, 1927

#88.

Half dozen short dips with #12 net between 12.30 and 1.30 a.m. High sea and driving snow, cold and blustery. Got Euphausids and copepods. Would think rush of water would tear former apart. Just missed a huge wave that poured down off the bridge. Fortunately I was under the bridge and it poured down the steps. With boots and oilskins found myself amply protected.

~~Thermometer #86014, #N. 224 written on glass, printed on glass.~~

#89. Whalebone dump. Enter Mar. 8, I guess

Mudd off anchor. Fluke 60 fms. Port Forster, Deception Id. Also piece of kelp without leaves on anchor. One float saved for Bryozoa. Mar. 10, 1927.

#90. Mar. 13, 1927

9.00 p.m. townet haul through "narrows" into Stanley Hbr. #12 net. Taken while ship was going at slow speed.

#90a. Mar. 14, 1927

Seine haul in lower Bay = N.G. Caught nothing.

#90b. Mar. 15, 1927

Tried townet haul from municipal dock to Harbor Master dock, got nothing.

#91. Mar. 15, 1927

Went through about 15-18 so-called mullet heads and stomachs. Got some parasitic copepods, from stomachs some macerated worms, and lots of tiny bivalves and debris.

#92. Mar. 16, 1927

Collected in 1/2 fm. from Co.'s pier to 1/2 way to slaughterhouse, about to nearly in front of cemetery. Falkland Id. Co. Rocky bottom, but large spider crab came from weedy bottom under Company's pier.

# March 17, 1927.

Too windy to go out.

#93. Mar. 17, 1927. 5.00 p.m.

Tug Capt. took me out to coal dock; made two hauls with boat dredge in 1-2 fms. Got very little

#94. Mar. 18, 1927. Friday.

Tried pools in hills behind Globe Hotel, but only got 2-3 very tiny F.W. amphipods, hardly worth while. Wonder if very strong high westerly wind made any difference.

#95. Mar. 20, 1927. 9-10 a.m. Saturday.

Took half a dozen dips with bottom sampler, just beyond narrows leading ~~on~~ into Port William, mostly sandy bottom, in 3-4 fms.

#96. Mar. 20, 1927. 9-10 a.m.

A similar number of hauls with townet ~~while~~ while going out to dredge, got a number of smaller medusae, a small fish, and lots of scum that may have diatoms in it. #12 townet.

#91. Mar. 15, 1927

Went through about 15-18

#97. Mar. 20, 1927

Rocky, weedy bottom. Half dozen drags with oyster dredge. Bryozoa and algae and the large spider crab, Eurypodius, and also Peltarion. This dredging was done in 8 to 10 fathoms, the limit of the rope we had brought with us. I had hoped to get a centolla or two, but the Scoresby got hers in 60 fms., five miles out. so I suppose I'm out of luck. I would like to get one or two at least.

#97a. Mar. 20, 1927.

The skipper of the Hbr. Master's tug, the Penguin, brought me a fish from kelp roots that I have not seen yet. Missed seeing one of the largest kelp roots pulled up that the Capt. had ever seen.

#97b.

Capt. of Wembly collected a few specimens along shore in York Bay just around corner of narrows going out eastward in Port William from Port Stanley.

#98. Mar. 27, 1927.

By Falkland Id. Battle Monument from kelp roots on beach.

#99. Mar. 26, 1927

Jack Davis collected off Kidney Id. Munida larvae surface. Shell, sipunculids, or echinoderms from kelp roots. ~~xxxxxx~~  
~~xxxxxx~~  
~~xxxxxx~~

#100. Mar. 26, 1927.

2 fms. deep, off anchor at Harbor master's jetty.

#101a. Mar. 31, 1927.

Douglas Sta. Sheep ticks at

#101b. Apr. 1, 1927. Greenshield.

Amphipods from beach near sheep dip.

#102. Apr. 2, 1927. Teal Inlet

1st inlet west of house by auto beach collections. Also stuff school kids . . .

#102b. Apr. 2, 1927.

Lice from two upland geese shot this day.

Apr. 3, 1927. In trout stream nr. west of house.

Apr. 4, 1927. In stream in hills, snipe hunting S.E. of house.

#104. Apr. 4, 1927.

Fresh water amphipods and leaches.

#103. (See above Apr. 3, 1927). Near Teal Inlet

Trout and stomach contents.

#104a. Apr. 4, 1927

Mullet copepod.

#105. Apr. 9, 1927.

Out with Harbormaster's tug, 14-15 fms. off ~~lights~~ lighthouse N. side Port William. Oyster dredge. Shells and crabs in first tow. Fine red seaweed and crabs in second. Blank in third haul, 2 Peltarion only.

#106a. Apr. 10, 1927.

Fish off Malvina house under rocks. Roy Felton. "Conger eel."

#106b. Apr. 11, 1927.

Ditto by Richard Deane, same place. "Dogfish."

#106c. Apr. 11, 1927.

Fish caught off jetty. Boy called it Mouth almighty, or mouth a'mighty.  
Rock cod off Municipal jetty. Apr. 12. 1927. Edward Lellman.

#106d. Apr. 13, 1927.

Yellow belly off Municipal jetty.

#107. Apr. 14, 1927. 11.30 a.m.

Clam rake scrapes off low of Great Britain. From 1 fm. deep and up  
to surface. Water sample: Temp. 7.°3 C.. Density 1027, Temp. 44° F.,  
H.I. 8.13. One lot of amphipods living in sponge.

#108. Apr. 11, 1927. Teal Inlet.

Beach collections by school children.

#109. Apr. 15, 1927.

Near wireless station at head of Port Stanley, west end. Beach and seine  
collection.

#110. April 16, 1927.

Beach collection near municipal jetty. Collected by boys.

Edward Lellman  
Richard Deane  
John Kendall  
Ruben McLaren

#111. April 16, 1927.

Bottom sample off jetty.

#112. Apr. 17, 1927.

(Bright sun)  
Water sample: Water 9° C., H.I. 8.0 even, Density 1027, Temp. 49° F.

Freshwater pools (H.I. 5.3) back of Govt. House, Port Stanley, vicinity  
Geo. Bowner's horse shed. Amphipods and other vial vermilion colored crustacea.

#113. Apr. 18, 1927.

Mullet creek, <sup>beach</sup> ~~head~~ and 20 ft. bobbinet seine collection.

#114. Apr. 20, 1927. Near Penguin rookery.

Sparrow cove. Mushroom on land and other stuff on beach.

#115. Apr. 22, 1927, Friday. Port William

between Pembroke lighthouse and Tussuck Id., in 10-12-15 fm. more or  
6-7 dredge hauls, oyster dredge/ Density 1027.5, Temp. 43° F. less

#116.

Townet haul same day and place.

#117. York Point, Port William. Apr. 24, 1927.

Shore collecting, 1-2.30 p.m. Sand from ~~xxxx~~ beach separating Whale Sound  
from ocean reddish and green.

#118. Apr. 26, 1927.

Drag in lower bay = Whale Sd., about 2-2½ fms. Unsorted junk from  
Winders Pier through narrows.



#119. Apr. 1927

Frog given me by Charles Hamann, Soc. Menendez-Behety, Casilla J, Punta Arenas (write letter to). From Estacion Laguna del Oro de Santa Cruz near Puebla Ness.

#120. May 4, 1927. Rio Gallegos.

Bottom sample (pebbles only), 5 fms. Also townet haul, surface #12 net. 12.00 p.m., 15 minutes.

#121. May 5, 1927. Santa Cruz, Argentina.

8 fms. Also townet 40 mins., surf., #12 net. 12.00 - 12.40 p.m. Santa Cruz.

#122. May 5, 1927. Santa Cruz. 11:15 a.m.

Few amphipods from under rocks on beach and some hydroids and algae on mooring rope. (Gravel beach.) Beautiful balmy clear day; cold, however, at sundown. Beautiful sunsets each day. Towntet in 120 & 121 hung out against rising tide.

#123. May 6, 1927. San Julian, Argentina.

Beach collecting,  
/10.00 - 11.00 a.m. Also surface townet haul, 15 min.,  
1.00 - 1.15 p.m.

May 4, lay to over night waiting for change of tide. Left at 12.30 p.m.

#124. May 7, 1927. Deseado.

Tide. Crabs under rocks for first time. An estuary which seems to have very good collecting ground. Beach shingle.

#125. May 8, 1927. Comodoro Rivadavia. Sunday.

Bottom sample at anchorage. At beginning of falling tide. Got most material from one piece of old kelp root found on beach. A few isopods and fossils from rocks alongside ~~sh~~ of breakwater, and one amphipod under a rock on opposite side of landing pier from breakwater, about 1/2 mile from pier. Only amphipod from this place. Oil on rocks by breakwater too much for animal life. Was surprised to find ~~amphipods~~ isopods and few algae here.

#126. May 9, 1927. Puerto Madryn.

Mostly a sandy playa with some gravel patches. Walked a couple of miles to northward of pier without finding rocky patches. Got some amphipods from an old dried ~~ex~~ kelp root rolling in waves on beach. Got a few Idothea-like isopods from grass roots. Sanders got a couple of amphipods from gravel near landing pier.

#127. May 18, 1927.

With Felippone collected at Carrasco and tried to get picture of leaf-cutting ants.