Pago Pago, American Samoa

Oct 11 0000. Set sail from harbor north to open Pacific. Seas relatively calm. First watch for birds began 1000; I joined Woodward and Harrington on the bow. Although seas somewhat calm I soon became sick from the swaying motion and retired until 1430. My observations during first watch were nil. At 1430 returned to flying bridge where Kepler and Ustvedt were observing. Avian activity sparse; birds, except several white-tailed Tropicbirds and one Fairy Tern, remained some distance from the ship. Other species observed were Black-footed Booby, Brown Booby, Wedge-tailed Shearwater, Common Noddy Tern. All observations entered in observation log. General behavior of birds aided greatly in identifying individuals, particularly those some distance from the ship—horizon 1 miles from flying bridge. Boobies, large birds, tended to circle at high elevations of 200 ft or so when occurring in feeding flocks. Individuals flew low to water and more than 10 ft above it, when feeding alone; flight linear with slow dipping—somewhat like parrots fly. Shearwater tended to glide near the surface without heavy flapping of wings. Their paths of flight were somewhat circling at elevations 20 ft or less. Terns behaved much like shearwaters but their wing was more vigorous and flight path more linear. The tropic birds seemed to circle about the ship flying 20 ft or so above the surface, wing-beat heavy but intermittent with gliding. At distances some of these birds were
Pago Pago, American Samoa
Oct 11 observed morphological and chromatic characteristics were useless as means of identification. Weather—partly cloudy with some intermittent showers, gusts of wind not exceeding 30 miles/hr, warm.
Oct 12 2nd day at sea. Pacific Ocean
0600-0800. Crossen and I drew first watch. Went aboard bow observed. No feeding flocks of any significant size observed. Several species of petrels were noted including two uncommon species—Mottled Petrel and Kermadec Petrel. Other petrels included Black-winged Petrel, Fairy Terns, Sooty Terns, White-footed Tropicbird, Wedge-tailed Shearwaters were other species observed. All accounts entered in observation log. Note—flight patterns of petrels seemed unique to those of terns in that petrels tended to fly low to water, 20ft or less, veering in semicircular paths, diving then repeating somewhat like a sine wave such that the belly of an individual can be seen seen in one interval between dives and the dorsal surface during the next interval. Weather—same as that of Oct 11, 1965.
And day at sea, N American Samoa, Pacific Ocean

13 Oct 1965
1000 to 1200 and from 1200 to 2000. Weather— partly cloudy, few squalls, wind moderate with gusts, medium swells. Most squalls distant from ship but rain occurred on deck 1745 hrs. Cruising 8 to 10 knots. First watch aboard 1200 to 2000 with D. Husted. Sighted following:

Shear-Pet 3 W
Mottled Petrel 7 SW
Sooty Shearwater 45 SSW and SW
Wedge-tailed Shear 1 S (dark phase)
Sooty Tern 3 NE
Storm Petrel sp. 2 W small broad wings with large white rump patch

Second watch aboard 2000 to 0600 with T. Tordoff.
Sighted following:

c Wandering Tattler 1 collected T. Tordoff (?)
Sooty or Slender-billed Shearwater 4 SW
FF Sooty Tern 28
Wedge-tail Shearwater 4
Sooty Tern 4

Birds were not abundant and many difficult to see. Mottled Petrels flew in marching manner much like other petrels. Conspicuous dark diagonal bars on underwings and grey-black upper wings aided in identification of this species. Their flight often close to water not exceeding 20 ft in height. Sooty Shearwaters flew much like Wedge-tailed Shearwaters but Sooty's are darker—black; some have silver bands beneath wings. Slender-billed Shearwater not distinguished from Sooty Shearwater. Sooty Terns had more rapid wing-beat than did shearwaters, plus they
are slightly smaller than shearwaters. Flight of these terns may or may not have been linear. Circling about an area indicating foraging behavior although I did not note feeding. Storm Petrel sp. appeared to be Leach's Petrel although others observing considered breadth of wing and size of white rump-patch too great to qualify individuals as members of this species. Flight was slightly higher above water but in the same manner as other petrels. Wandering Tattler—shorebird flight of heavy, rapid wingbeat and linear direction with slow, or rapid, bank turns was noted. Bird collected. Tordoff fired 4 volleys of shot missing when bird returned on starboard side & shot as it approached me straight-on. Tordoff fired at the same time; the bird went down; Tordoff claimed the specimen. Bird medium slender bill gray above, marked brown below. Size slightly larger than a Ruby Turnstone.

14 Oct. 4th day at sea, North American Summer, Pacific Ocean
On watch 0500 to 1000 and 1600 to 1800. Activity of birds reduced. Flocks small and far generally either shearwater or tern flocks. Most birds seen were solitary. One Ruby Turnstone collected by P. Crosson. (Both watch periods were accompanied by Crosson.) Between 1600 to 1800 rain and westerly winds up to 30 knots occurred. Watch taken from bridge of ship during rain. Brown Booby and Sooty/Slat-billed Shearwater seen.

15 Oct. 5th day at sea, North American Summer, Pacific Ocean
On watch 0800 to 1000 with P. Woodward. Both Sooty/Slat-B Shearwater and dark phase Wedge-tailed Shearwaters seen. Mottled Petrels also seen.
Howland Island, 004 N 1763, Pacific Ocean

15 Oct 1943. Arrived island from Shearwater via rubber raft with outboard motor. After landing equipment party returned to ship except island party, Mage and Fleet. At 2030 after radio contact Fleet and I departed campsite to band Blue-faced Boobies but an approaching heavy squall forced us to return to camp. It rained all that night and the following day until about 1630. At night we banded, repainted banded birds, and streamerred all caught birds not possessing streamers. Accounts of birds banded and return birds were recorded in notebooks for future use. Fifty-four returns of the Blue-faced Booby were recorded by us. Fifteen Blue-faced Boobies were banded—3 nestlings, 5 immatures, 2 adult females, and 5 adult males.

No series for birds band were 587-83601 to 615.

Following camp activities a shorebird count was conducted along littoral areas of the island. The following species and numbers were tabulated: Golden Plover 46, Rudy Turnstone 7, Wandering Tattler 8.

At 2030 banding commenced banding. Forty-six returns were recorded. Six Brown Boobies were banded—1 immature, 1 subadult, 3 adult females, and 1 adult male. Two Blue-faced Boobies were banded—1 immature and 1 adult. Series for all birds banded included 587-83616 to 623.

Other birds handled were either repainted or streamerred and painted. Runs commenced at 0030; party retired.
Novel Island, 004N-1763, Pacific Ocean

17 Oct. Description of Novel Island: The island is kidney-shaped according to map and location of camp is as follows:

As one approaches from the sea, the first view of the island is one of a surface barely above sea level, green bordered with white sand beaches. (We approached from the leeward side.) Moving from the west shore eastward, one finds first a white sand beach with scattered coral rock and shells, landward clumps of begin to appear within 30ft the blend with other vegetation forming a complete cover over the island. With the exception of the leeward, or 30, of beach described above, the only other portion devoid of vegetation is the opposite windward beach where vegetation cover ceases along the rocky upper portions of the beach. The windward beach is about 3 rock and 3 sand, depending on the
Howland Island 00°46'N-176°3, Pacific Ocean

17 Oct.

Vegetation composing the cover seemed to be composed of 4 species — 2 grasses and *Digitaria pacifica*, and 2 low succulents. With exception of one live Cordia tree ( ), near the center but slightly south of the midpoint of the island, about one dozen dead Cordia trees stand along the central axis south of the live tree. It appeared that *Digitaria pacifica* grows more central on the island in large patches while grows in clumps, and in part patches toward the interior, about the periphery of the island. The succulents seemed to cover everywhere the grasses did not, except on the beaches; although by origin the reverse case may be true, i.e., grasses grow where do not. Fauna observed can be conveniently categorized as follows:

Invertebrates

A. Crustaceans

1. Hermit crabs
   a. large orange species about island but mainly on beaches
   b. Small white species only on beaches

B. Insects

1. Flies (perhaps several species)
2. Dermestid beetles about remains of dead birds and camp
3. Water striders on beach (leeward) only
Howland Island, 00°N-17°W, Pacific Ocean

17 Oct.  

Vertebrates

A. Fishes, seals, etc.
   1. Black-tailed sharks in reef waters at low tide often a few feet from the beach
   2. Moray eels among reef rock at low tide
   3. Numerous small reef fishes
   4. Mellet seen only at night along beaches

B. Reptiles
   1. Small brown gecko common about camp and about lighthouse
   2. Small skinks, perhaps 3 inches in length, common about the lighthouse and in the vegetation

C. Birds
   1. Great Frigatebird flying (gliding) at high altitudes over the island at day and a few roosting in the dead Cordia trees at night
   2. Lesser Frigatebird common, flying (gliding) at high altitudes at day, roosting in dead Cordia trees at night (at least 25 or so), and a nesting colony (36 nesting) near the SE corner of the island
   3. Blue-faced Booby common resident and visitant stationed on ground mainly at night in "clubs" or nesting pairs about the perimeter of the island a margin of 75 yards from the edge of the vegetation in 1963; perhaps 1000 individuals
   4. Brown Booby nesting and roosting at night, along the edge of cover in the SE corner
Howland Island, 00°46'N-176°3, Pacific Ocean
17 Oct

4. (continued Brown Booby) and 5 and of the island, perhaps 50 or more indiv.
5. Red-footed Booby restricted to roosting and nesting in dead Cordia trees in central area of island, perhaps 100 to 150 indiv.
6. Rudy Turnstone along beach at day
7. Golden Plover mainly along beaches but also near beaches in vegetation at day 40 indiv. or so
8. Wandering Tattler along beaches at day, perhaps 10 indiv.
9. Incidentally — one White-tailed Tropicbird (they maintain nesting colony at other times of the year)

D. Mammals
1. Domestic cats 5 indiv. seen about island near 5 beach
Howland Island, 004N 114W, Pacific Ocean
18 Oct. Rain continued intermittently until approx. 1000. Following camp activities (meal) radio contact was made with USNS Shemakwa. At 2100 party (Fleet and Alge) commenced banding activity. Fourteen birds were handled of six were Brown Booby - 1 subadult, 1 adult female, 4 adult males (2 males on eggs); eight were Blue-faced Booby - 1 immature, 1 subadult, and six adult males. Series of bands used included 587-83624 to 637. Fifty-three returns were noted; of these 18 were Brown Booby and 35 were Blue-faced Booby (some in clubs). Other boobies caught were repainted or painted and streamerred. Two cats seen on Sand.

19 Oct. During the morning 0930 on, nest count for one-half of the island was conducted. Twelve Brown Booby nests were found mainly along bordering vegetation ridge adjacent to the S5SW beach; of these 8 had no eggs, 3 had 1 egg, and 1 had 2 eggs. 1 nesting and one 2 adult. Fourteen Blue-faced Booby nest were found - 13 with lone nestlings and 1 nest with 2 eggs. Nest count survey was conducted from beach sand to about 150 yds inland about the periphery of ½ the island. At 2030 banding was started. One cat was seen a short distance from camp 50 yds N of lighthouse. Five Blue-faced Birds were banded - 2 immatures, 2 adult females, and 1 adult male. Thirty-seven returns were taken on Blue-faced Booby; no Brown Booby were encountered. Work was conducted N along leeward side of the
Howland Island 004° N, 176° E, Pacific Ocean

19 Oct island to just past the point; and several hun-
dred yards southward on the windward side. Most
birds comprising two clubs were near the point.
Many boobies had been worked; the remaining birds
were banded, streamerred and painted, or repainted.

At 03/15 and for nearly an hour thereafter, a rain
with a steady wind of about 40 miles/hr harassed us.
Occasional gusts may have reached 50 miles/hr.
At 0930 completion of west census was carried
out by moving NW of camp (in the opposite dire-
tion from yesterday's census) and skirled the
periphery of the island until we met the end
of yesterday's census on the E side of the island.
Twenty Blue-faced Booby nests were found—one
nest contained 2 eggs; the remainder were single
nestlings. Blood samples were taken from Red-
footed Booby—10 samples; 10 cc blood per
sample were taken at 2030. Ten Red-footed
Boobies were banded. All these boobies were
caught by hand from low roosting perch
parakeets of dead Carolina trees in the center
of the island. Many of these boobies flew
when approached; out some 100 individuals
only 25 were caught, banded and streamerred,
or sampled for blood, or both.

21 Oct: Heavy rains fell early morning accompanied with
strong winds up to 50 miles/hr. The canvas tore
on the south, windward side even after we had
secured each pole with 2 to 3 additional ropes.
The tent blew down and all belongings and
Howland Island, April 1763, Pacific Ocean

2/ Oct. occupants were thoroughly drenched. The rains stopped at daybreak but the wind continued out of the S and E all day from 15 to 20 miles/hr. At 0930 nest litter (herbage) samples were collected. Fleet collected from 1 Red-footed Booby and 1 Greater Frigatebird nest. 2 collected from 2 Brown Booby nests; one contained one egg, the other was newly built. After returning to camp we organized materials and broke camp. Landing party of three (Mannis, Poly and Aston) arrived by rubber raft (motor driven) on leeward side at 2/30. Cargo was secured and we headed out against heavy wind driven surf. A series of 3 foot to five foot waves caused us to capsize. One man ahead of me on port side was thrown overboard prior to the raft’s capsizing. Apparently his weight in the water caused the raft to be dragged bow to the port side causing the 3rd wave to throw the raft over. Most of the contents and all occupants made it to shore (the radio was retrieved from the water at about 2/30). We lost one shovel, the tent poles, one cot, one pair of glasses (Fleet’s) and a portion of the radio antenna. None of the occupants were injured although there was a great chance of it. When we capsized I was thrown beneath the raft and raft, boat cargo, etc. floated over my head. When I surfaced I was entangled in tow line rope along with Fleet and Mr. Aston. Fortunately the surf did not catch the raft or some of us could have been stranded or drowned.
Journal

Howland Island, 004N-1763, Pacific Ocean

21 Oct in the snaring rope. It had been intended that another raft with outboard motor, 4 oarsmen and 5 additional occupants for weight would tow us with a 600 ft lead of rope. The weight of raft would be turned back by the surf pulled the leading raft backwards even while all were rowed and the motor pulling at top speed until the rope broke when we capsized. Gear was fetched from the water and raft was retrieved. The tent was set up over one of the leading marker poles and was held up by rope tied to another marker pole. We ate what few cans of food we had left (brown bread, peanut butter, and fruit candies). With only one set of the other four of us slept on the ground, cushioned by our life jackets. It rained all afternoon and again that night with strong wind.

22 Oct At 0530 we had hope the surf would be down and the tide out. The tide was going out but the continuous wind maintained a strong surf. We beached the raft and walked it south in shallow water south to get to the windward side that at this time had a low surf due to the westerly winds we had recently. First we tried pulling the raft with 200 ft lead of rope by 2 men on the beach, but 3 in the water holding the raft. This did not work so we all walked the raft until harassing sharks and a colony bed of spiny sea urchins forced us aboard. Just beyond the south point of the island on the
Journal

Houtland Island, 004°N-1763, Pacific Ocean
2204
windward side of the island there was a small channel in the reef and a low surf. The other 4 rowed vigorously and we made it to the ocean beyond the surf. Apparently the ship did not see us and moved all the way around the island before picking us up. We were out of the surf at 0910 and picked up at about 1015. No injuries were noted except Mr. Aston stepped on a sea urchin and drove a spine through his shoe into his foot, and Fleet and I got somewhat sunburned while we were drifting at sea waiting to be picked up.
Journal

Christmas Island, O15N-13°3, Pacific Ocean

28 Oct. On watch with Harrington aboard USNS Shearwater. Observed increased number of birds as we approached Christmas Is.; among them, Harrington and I saw Christmas Island Shearwaters, Phoenix Island Petrel, Fairy Tern (more numerous than at sea), and other species seen along voyage from Howland Island. Watch was discontinued before 1200, when ship anchored off island. Landing party of 2 rafts brought 9 S.I. personnel (Fleet, Crossin, Kepler, Woodward, Harrington, Amerman, Fordell, Husted and Maze) and S.I. landing cargo ashore at about 1200. Residence of S.I. personnel was established in vacated Officers' Barracks by permission of the District Commissioner, Mr. Wardell (spelling?); of the Gov't of Great Britain. The D.C. also furnished use of one Landrover (3 of 4 cylinders working but best that could be offered) for our personal use.

At 1400 to 1600 approx. S.I. personnel surveyed Christmas Is. along main road for Sooty Tern colonies. About 6 swarms were seen plus 3 colonies were seen. We stopped at the 3 colonies which were located as follows: (1) adjacent (Nor) vacated barracks of old Pacific Missile Range, (2) at sole lagoon turnoff, and (3) about 7 miles further out on single lane main road. At 1630 to 1830 approx. Husted, Fleet, Kepler, Amerman, Woodward and I took raft to Cook Is. and collected blood samples from 2 Phoenix Is. Petrels, 3 Red-tailed Tropicbird, Sooty Tern, Christmas Is. Shearwater, Terns airborne after. Woodward also banded some Fairy Terns by net catching. Upon returning to
Christmas Island, 01°5 N. - 1°73°, Pacific Ocean

Christmas Is. is an active volcano. Specimens were collected by R. Cross, J. Tordoff, and B. Harrington. Species included 2 specimens of species of Lava Aekepl, Crested Tern, Golden Plover.

After skinned, further blood sampling of Sooty Tern along the beach was attempted but only 3 or 4 adult birds were seen at colony sites located earlier in the day. The Landrover ran out of petrol 17 miles but which further hampered activities such that the remainder of the day was spent in camp. Much thanks to Gibberteset fisherman, who came along in a truck, for delivering no 5gal. of gas!

Hustled and I returned to USNS Shearwater to spin blood down from yesterday's blood samples, collect water, food and miscellaneous gear. The rest of the I. personnel left about 12/15 to survey island. Four birds were collected - 1 Blue-faced Booby, 1 Red-tailed Tropicbird, and 2 Shoveler (ducks). Specimens marked and put on ice. At 1850 party split; Fleet, Woodward, Hustled and Tordoff went to Motu Upane, the rest of us travelled by Landrover to Isaka Lagoon on Christmas Is. Sooty Tern colonies located the day before remained in air - moon set at 2330. Along lagoon was small nesting colony of Wedge-tailed Shearwater.

Twelve blood samples from 12 adults taken. Further along road following blood samples were taken and birds banded: 40 RFB, 9 BFB, 2 GF and 7 Tats (cats collected en route to and from and 2 in ST colony). Red-footed Booby colony where samples were taken had at least one nest with small chick. The other birds, BFB, GF, apparently were not
Christmas Island, 016°N, 157°E, Pacific Ocean

nesting at this location. Nesting colony of GF was observed on a small island in lagoon. Crossin swam to island and observed — GF, adults and chicks, Phoenix Is. Petrel, Blue-gray Noddy Tern (one), Common Noddy Tern, BFB, and some Storm Petrels. Those who went to Motu Upuru collected blood samples from Phoenix Is. Petrel and Christmas Is. Shearwater (1000's), Wedge-tailed Shearwater, Fairy Terns,

After returning from night before at 0430 activities were not resumed until about 1030 at which time Crossin, kepler, Auceman, Harrington, Woodward and I surveyed enroute to, and on, several islands in the major lagoon. One Shoveler was collected by Crossin and one Laurakeet (2 others collected by Crossin on 29 Oct.) was seen flying parrot-like flight along major road. I took several habitat photo slides on Christmas Is. At about 1730 we broke into 2 parties — first, Woodward, Crossin, Auceman and second, kepler, Harrington, and I and surveyed small islands in lagoon (Jake lagoon) for nesting. Harrington, kepler, and I surveyed 4 small islands, previously named by SIC personnel on an earlier SIC trip, named Dot, Lost Far, and Rat (so named because one small rat was seen by us). The following flora and fauna were observed:

Dot Is. CNT rest 16
Lost Is. BB " 26
RFB " 1 large N 150 2 mm.
RTTB 3 large N
6 flat w 6

Far Is. BB nesting and CNT egg
Journal

29 Oct 1965

Motu Upua, Christmas Island, Pacific Ocean

At 2030 party split - Fleet, Crossin, Huntsd, Harrington, Kepler and I went to Motu Upua to collect blood samples and band. Woodward, Tordoff and Amerman took Landrover and went along main road to collect blood samples. Those of us on Motu Upua island collected blood samples from dark phase WTS, CIS, PIP; all these species were banded as well. Total bands used were less than 1,000. Population estimates (my estimates) for birds on the island were as follows: WTS 500 ± 200; CIS 10,000 ± 3,000; PIP 15,000 ± 3,000. All these species were collected from the ground beneath scrub vegetation or from open areas (particularly WTS). All WTS banded were nearly all immature birds. Party retired at about 0130 hrs. Three quarter moon caused birds to be a little edgy until about 1230 hrs when moon set.

3 Oct 1965

At 0800 SI personnel boarded USNS Shearwater and completed day with at-sea duties.
Black-footed Albatross
(Diomedea nigripes)

1st day 5 Honolulu, Hawaii, Pacific Ocean

26 Feb. Forty-six adult birds constitutes maximum number seen during visual hours. These masters of aerodynamics are efficient gliders even near the water. They glide in figure-eight patterns with one oval usually windward, the other leeward. Usually when approaching windward end of oval they gain some altitude, up to 50 ft. above water; then upon leeward turning with wings outstretched, apparently to gain maximum momentum from wind force, they glide with the wind, descending slowly. On the leeward turn they begin with the wind pushing so that when they complete the turn they are again facing into the wind. This maneuver is efficiently executed by tilting the wings; the wind drives the bird into the turn.

\[ \text{Wind} \rightarrow \]

These albatrosses descended when wings were drooped and slightly bent down. When wings were straightened out and extended birds ascended.

01 Mar. One individual was still following the ship at sunset, but the others have left; most of them left the night of 28 Feb. Apparently these birds follow a ship to sea for a number of days then return to the Hawaiian Islands.
Many hermit crabs, orange-red in appearance, have been noted on the island about camp. Last night ten, or so, individuals invaded our tent (Fleet and Maze). These crabs range in size from \( \frac{3}{4} \) to \( \frac{5}{8} \) inches in length, including soft parts of abdomen. Forty individuals were marked in an area between the plane wreckage and composite, a beach approx. 50 yards wide. Individuals marked were painted on right legs with blue paint from an aerosol spray can. Eighteen such marked individuals were collected and returned beneath a coral rock 50 ft., or so, W of plane wreckage; other were painted and return to residences in the surrounding area. Later checks should show movement of all 40 individuals—whether they remain in the vicinity or move elsewhere and whether all of the 18 under the coral rock remain?

Some other individuals were noted returning to the island from the ocean.

Two color phases of this species noted—one a little lighter orange, the other a darker red, orange. No individuals of the 18 marked ones beneath rock were noted at 1700.

No individuals of 18 marked beneath rock noted at 1730. Several photographs taken of other individuals of both color phases. Congregations of these crabs were noted about the garbage pit near camp and about decaying, fallen coconut trees. Their activity appears most intense at night.
Hermit Crab

Campsite, Holland Island, 00°40'S - 176.3°W, Pacific Ocean

20 Oct 1963 2300 hrs. Yesterday all sandwiches and bread was thrown into garbage pit along with tin can and bit of C rations. Better than 50 of these crabs gathered within 10 ft radius of the garbage, many others were about the vicinity. I examined 50 individuals, both dark red and light orange - six dark red individuals possessed egg masses and six orange individuals possessed egg masses. I also noted that color phases are not strictly limited to dark red and orange. Of the 50 individuals examined, color ranged from light orange, with blended areas of white, to one almost a black-red. Factors other than sex determine color phases, and perhaps age. Individuals examined beneath coral rock; 9 of the 18 marked ones were seen along with 7 other crabs. Another species has been noticed which is much smaller, uses a smaller more flattened white shell, and hides within its borrowed shell. The crab studied here uses a larger spiral shell. Including the 50 marked individuals almost all individuals were the same "type" of shell as follows:

[Sketch of a shell]
Hermit Crab

Christmas Island, 015N-1573, Pacific Ocean

28Oct Individuals of large orange species seen on Howland present on major island. Seen along road at night. Population did not appear as concentrated as it did on Howland Is.

Cook Is., Christmas Is., Pacific Ocean

Individuals seen beneath large holocotop (spelling?) breeder.
Wedge-tailed Shearwater  
(Phalacrocorax) 

Mauna Island, Im. E. Kauai Beach Park, Kauai, Hawaii  
30Sept. large nesting colony established there. After sunset  
approx. 700,000 individuals settled on the island off  
and on during the night; at sunrise they departed  
to the seas. When they were on the island most  
orost on the ground. Many weird noises were uttered,  
groaning, wheezing, honking noises —some  
almost human-like. Individuals roosting were  
early approached by shining bright light on  
their eyes. Adults tended to nest everywhere but  
on rock outcrops and beach; they maintained nesting  
colonies in loose soil slopes on west side of extinct  
volcanic crater and in loose soil on crater floor.  
Nesting burrows, by the thousands, were only about  
20% active; containing they usually contained chicks  
with thick, long, grey down, some with developing  
primaries, nesting apparently in advanced stages. Nest-  
lings hid in burrows, ranging in depth from 2 to 4 ft  
and in width 6 to 10 inches, during day advancing to  
openings near sunset and throughout night until day-  
break. Parental adults fed chicks by inserting back  
into esophagus of chick and regurgitating fish.  
During feeding calls of chick and adult appeared to  
reach a crescendo. Most adults had grey-white bellies,  
grey-black upper wings, back, and head and tail,  
elongated
Wedge-tailed Shearwater
(Puffinus pacificus)

Mojave Upupa, Christmas Is., Pacific Ocean

30th

Dark phase individuals seen at sea throughout voyage from Am. Samoa via Howland Is. to Christmas Is. Birds much the same as light phase birds seen on Manana Is. but dark grey-brown throughout with pink feet. Immatures were banded on this island (Mojave Upupa). Not as common as C1S or P1P. Calls not as elaborate as light phase birds on Manana Is. Estimated population was 500±200.

3Nov

4th day at sea N of Christmas Is., Pacific Ocean.

Dark phase individuals predominately seen since Christmas Is. but light phase individuals seen over water.
Sooty Shearwater
(Puffinus griseus)

3rd day at sea N. of Am. Samoa, Pacific Ocean

13Oct Forty-five individuals seen during day. Claimed not to be distinguishable from Sooty-billed Shearwater in the field. Some birds seen had silver underwings others not. Close in appearance to Wedge-tailed Shearwaters, but blacker, slightly smaller body in proportion to wing size, and often fly close to water, 20 ft or less.

15Oct Arrival Howland Is., 004W. 1763 Pacific Ocean

Individuals seen at sea throughout trip from Am. Samoa. Tend to shy away from ship thus difficult to collect.
Christmas Island Shearwater  
(Puffinus nativitatis)

28 Oct  
Christmas Island, 015°N-15°33', Pacific Ocean  
First individuals seen at sea before 1200 hrs. within 10 miles of island. Birds much like Sooty/Slender-billed Shearwater except wings not proportionately as large in relation to body size. Flight unique to other shearwaters seen to date; flight linear (somewhat so), conspicuous wingbeat rhythm of 3 or 4 vigorous wingbeats glide, 3 or 4 vigorous wingbeats glide, repeated throughout flight.

28 Oct  
Cook Island, 015°N-15°73', Pacific Ocean  
Five individuals seen beneath 3 different Heliotrop grasses. All remained concealed when approached generally moving on foot to opposite side of bush. All adults black throughout, black feet, slightly smaller than Wedge-tailed Shearwater but uttering call notes quite similar. All roosted on ground beneath bushes.

30 Oct  
Motu Upea, Christmas Island, Pacific Ocean  
Large colony of 10,000+ birds roosting on ground about and beneath burrow and shrub vegetation. Members interspersed with Phoenix Is. Petrels and fewer Wedge-tailed Shearwaters.
Mottled Petrel
(Pterodroma hypoleuca)

20th Oct

1st day at sea N of Am Samoa, Pacific Ocean

Individuals seen at sea throughout late morning and afternoon. Aerial flight of this bird characteristic of petrels (so I am told) and unique to shearwaters and terns. Flight low to water much as follows:

\[ \text{Diagram: Aerial flight of petrel} \]

Individuals observed bank 45° or so when arcing in alternating fashion such that the dorsal surface can be seen in one arc and ventral surface in the next. Dorsal surface light gray-brown about back and upper wings; ventral surface washed white on belly, throat, under tail and underwings, except conspicuous black border taping to diagonal bar on underwings black patch on inferior (posterior portions) of belly.

13th Oct

2nd day at sea N of Am Samoa, Pacific Ocean

Two individuals seen at sea. Much the same as described above.

15th Oct

3rd day at sea N of Am Samoa, Pacific Ocean

Individuals seen at sea.

28th Oct

Arrival at Christmas Is., C15N-1573, Pacific Ocean

Individuals seen throughout voyage from Howland Is. on the 22nd Oct.
Mottled Peacock

Johnston Atoll Grid to American Samoa

09 Mar. One individual off port on S direction of ship flying along side toward astern. Flight with considerable year in which ventral surface of wing was exposed, appearing thusly:

Dorsal surface of wing with black border
Blue-Faced Booby
(*Sula dactylatra*)

15 Oct

Haviland Island, 044°W. 1763, Pacific Ocean

1330. Upon landing on this island and shortly before, while aboard ship, a number of large gliding birds were noted, among them the Blue-faced Booby. General appearance of adults is large bird, approx. 2 ft from tip of bill to end of tail and approx. 3 ft wingspan, somewhat plump, white body, yellow beak, hooked bill with darkened skin about lores and eyes (blending from the yellow bill and forming a mask about the anterior portion of the head), black wings above gray below, black tail, and slightly green darke Call 4 toes webbed) feet. Flight from land to sea was a linear take off involving vigorous flapping of wings while running. Flight at sea was usually of two types (1) vigorous and linear--low to water or (2) casual easy circling flight.

16 Oct

Large numbers of these birds tend to congregate in groups, "clubs," except pairs nursing nestlings. Approaching clubs requires some caution because birds nearest may begin skulking and wheezing, thus causing others to become alarmed, and resulting in the whole club moving out to sea. We (Fleet and Maze) observed this to happen several times. At other times adults remained asleep on ground, standing with head tucked back beneath wings. Such birds were easily approached because they would "blindly" stare into the light as one of us approached. Sexes of adults
Blue-Faced Booby

(Sula dactylatra)

Rowland Island, Off N - 1763, Pacific Ocean

16 Oct. as reported by Fleet, can be determined by voice—females squawk sounding something like frightened domestic ducks and males produce a high pitched wheezing honk noticeably different from females. We heard such differences in voice from different adult boobies. Several chicks were seen. They possess white down over most of the body except in those areas that correspond to the black areas on adults, namely developing primaries and retrices which were noted gray. Bills on chicks observed were almost black, felt larger in diameter than adults but roughly the same color. Clucks and pairs with nestlings were situated mainly about the periphery of the island up to approx. 75 yds inland, but not on the beaches. Feeding chicks, adult birds regurgitated fish while they inserted their beaks into the throats of the chicks. One adult fed one chick at a time. It appeared that one pair maintained one chick. Chicks when approached skwalked vigorously but seldom moved far from "nests" (open areas on gravel).
Brown Booby
(Sula leucogaster)

Howland Island, 00°N-176°E, Pacific Ocean

17 Oct. I observed this species at hand for the first time. In flight I had seen several adults in flight on 16 Oct. They were distinguished from other boobies by greater portions of body dark-brown and by the conspicuous brown bib about 3/4 down the belly with the remaining 3/4 posterior to whitish. The night of 17 Oct about 12 individuals were seen on ground. Color patterns of adults were as follows: Bill—yellow distal, blue then pink proximal (female) or greenish-yellow proximal (male); head—dark brown; neck, upper wings, back and rectrices—dark brown; 1/2 tert (anterior) belly—dark brown bib; remaining 1/2 (posterior) belly—whitish; feet—greenish-yellow. All toes webbed and birds slightly smaller than Blue-faced Booby observed. Nests were seen. Nests built on ground about 1/4 in diameter, mat-like, and composed of succulent plant stems, grass and some sand. Maximum number of eggs seen in any one nest was two; some nests possessed only one egg. Eggs oval-shaped, not conical, light chocolate brown with a few darker brown specks, placed in center of nest in slight depression. Eggs in appearance had thin shells on that longitudinal scratches were observed on the surfaces, not indicative of thin shelled eggs.

19 Oct. Twelve Brown Booby nests found; ten located along edge of vegetation SW corner of island, one along edge of vegetation S end of island, and one along edge of vegetation SE corner of island. Of these nests 8 had no eggs, 3 had 1 egg each, and 1 had 2 eggs and 1 nestling. Nests seemed to be built where they are inconspicuous and where adults can fly easily.
Red-footed Booby
(Sula sula)

1st day at sea.  No. America, Southern Pacific Ocean.

11 Oct.  Individual seen at sea, flying low to water, within 2 ft of the surface, in a direct, linear path due S. Wingbeat heavy but slow. Bird white with black wings, head protruding straight out with bill pointing in line with longitudinal body axis. Beak characteristic of boobies—greater than length of head, conical but slightly flattened on lateral surfaces (verified in later observations).

20 Oct.  Howard Island, 00W 17°33', Pacific Ocean.

About 100 individuals of various age groups, but mainly adult, were observed roosting in dead Cordia trees just S of midpoint of island (see description Howard Isld). Individuals roosted everywhere from 2 ft to top of Cordia trees, some 30 ft or so. In some of the 12-dead trees present all available limb space was taken by these boobies; in other trees roosting was more sparse and/or roosts were shared with lesser Frigatebirds. Two booby nests were noted, one about 4 ft, another about 1 ft above ground in two separate trees. One nest contained a large white down, black billed, blue-grey (?) footed chick. Nests were built of grass stacked about 5 inches deep and about 1 ft wide in supporting limb crotch. Adults possessed light blue bills turning pink then black about proximal soft parts anterior to head feathers. Two color phases noted for adults: (1) body feathers and tail entirely white, wings, particularly upper surfaces black and (2) dark phase—mantle light brown extending over head upper and lower surfaces of wings, darkening there, and over portions of tail while belly much lighter. Feet in all adults conspicuously red.
Howland Island, 00°4N-12°3, Pacific Ocean
(20 Oct. con 4.) Immature birds varying degrees of grey-
drawn throughout but soft parts as follows:
Subadults - bills pink with blended black in traces on
distal areas; feet pale orange; Immatures - bills
black distal, slight protuberance area of pink distal, feet
grey-blue blended with pink.

28 Oct
Arrival Christmas Is., 01°3N-15°3, Pacific Ocean
Individuals seen at sea when leaving Howland Is., and
again upon arriving here.

29 Oct
Isles lagoon, Christmas Is., Pacific Ocean
Roosting colony of 150+ individuals along lagoon just off road.
Birds, adults, subadults, immatures, and one nestling in
only nest seen, roosted in Messerschmidtia trees much
like Cordia trees on Howland Is.

30 Oct
Motel Uplu, Christmas Island, Pacific Ocean
Adults heard in Messerschmidtia trees along east side
of island at about 24:00 hrs.
Great Frigatebird
(Fregata minor)

Sand Island, Johnston Atoll, Pacific Ocean

18 Dec. Two groups of GF on this island utilizing two different areas: (1) GF roosting on guywires and pelagics, etc., (2) GF maintaining a nesting colony along S shore of island on the littoral rocks and ground above the high tide level. Fifty-five GF birds noted at large at 1200 hrs and 125 in the nesting colony. At 1900 hrs, 169 GF counted at-large on and about the island (no. guywires) and over 200 sitting in the nesting colony. Males in the nesting colony have inflated gular pouches; these swollen red sacs make it easy to identify GF.

20 Dec. At 0600 hrs, while banding roosting GF on the bunker of the volat. adjacent to Sand Is., one GF nest with one large white, chicken-like, egg was found. The nest was built of Tribehus custos and stems and cemented together with guano. It was situated on top of one of the bunker walls. When I approached the nest an adult F rose from the nest and hung overhead until I left; she gave a continuous distressed call. Among the GF's roosting about the nest on the bunker were adult F's, 9's, and subadults.

24 Dec. Total census of Sand Is. showed the following: at 1200 hrs, 21 GF's at-large, 68 GF's in nesting colony on S rocks; at 1900 hrs, 236 GF's at large, 150+ in nesting colony.

28 Dec. One adult F banded 737-44758 caught on guywire at 1030 hrs.

31 Dec. Seven GF's banded to finish string of bands which included 3 adult F's, 3 adult 9's, and one subadult. These were taken from birds roosting at the west end of the nesting colony. Two GF's returned #737-44196 and 737-44364 were both Sand Is. birds.
Great Frigatebird
(Fregata minor)

End Island, Johnston Atoll, Pacific Ocean

01 Jan. Gupwire census of entire island showed the following: at 1200 hrs: 113 GF’s at large and 150+ in nesting colony; at 1900 hrs: 105 GF’s at large and 220 in nesting colony.

05 Jan. GF nest on bunker (first noted 22 Dec, 1965) still active—one adult & 1 egg. Another GF nest with one large white egg and occupied by an adult & 1 was built on a hanger anchored off the condemned pier. Nest much like the one on the bunker—flat nest-like built of Tribolita stems.

10 Jan. GF adult & attacked GF immature which was flying near gupwire #23. The immature crashed to the water and drifted out toward Johnston Is. The adult fly on over by the nesting colony. Breeding behavior was noted at 1100 hrs. Adult & 1 hung in air just above adult & 1 on the ground in the nesting colony. Female and male nearly touched bills but she remained on ground and he stayed aloft. Such behavior noted in seven other instances, all cases lasting not more than several minutes. Concurrently four & 3 all with inflated gular pouches seated in a semicircle with a adult & 1 in their midst was noted. Apparently each & 1 was trying to win her favor by exposing his gular pouch. The & 1 would stay just over head for 1 to 2 minutes then ascend, likely recuperating from the strenuous flight, then again descend to the same positions. This behavior lasted for about 50 min. until the & flew off a short distance and landed in another part of the colony. Another peculiar form of behavior noted was when adult & 3’s and & 1’s would all raise their wings and shudder in unison. Males involved also inflated their gular pouches. This shuddering behavior has been noted on numerous occasions.

14 Jan. Gupwire census— at large 125 GF, in nesting colony 200+ GF at 1300 hrs; at 1900 hrs: 233 GF at large; 200+ in nesting colony. At 1200 hrs: GF
Sand Island, Johnston Atoll, Pacific Ocean

15 Jan. Nest count in the GF nesting colony gave the following number of nests: nest with one egg = 1; nest with no eggs = 12; nest occupied by an adult such that eggs or young could not be determined = 28. Over 50% of the nests were incubated by adult 9's at 1030hrs.

14 Jan. One GF adult 9 collected – it struck a guywire while flying and away from me.

17 Jan. Fifty-eight live adult GF caught at 2030hrs to 2100hrs. Birds taken from the nesting colony.
Breeding colony on Howland Is. Thirty-six nestlings out of estimated 1800 eggs remain. These nestlings are fully feathered but are not yet flying.
Johnston Grid to American Samoa

12 Mar. Sixty-five plus spinning porpoise leaping clear of the water spotted in two groups heading E off the port side. Individuals from 3-5 ft in length, bluish-grey in appearance were seen. Some when leaping from the water spun or rolled completely over in the air. Long snout, snout, and lateral fin were also noticed features of these mammals. Apparently there was surface food in the area; soon a feeding flock of 7 birds were with the porpoise, they being 1 FT, 3 ST, 1 BFB and 2 WTSP.
16 Oct

Newland Island, 50°N-176°E, Pacific Ocean

2030. One cat seen sitting in grass some 20 yards from us (Fleet and Mage). Headlights worn by the party apparently attracted the cat's attention so that his eyes were quite visible at this distance. Later an adult Blue-faced Booby was discovered having an open wound posterior to the right wing but evidence of broken ribs were not noted; this wound may have been caused by cats.

18 Oct

One adult cat was seen on the beach off the southeast coast point of the island. It moved cautiously passed us then broke into a run. It was having white patches on hind feet, dark gray, nearly black, somewhat degenerated in appearance, and having had relatively short legs. Another cat was seen earlier some 100 yards south of the campsite; it quickly disappeared in the grass. Both these cats were seen after 2030 hrs.

19 Oct

One adult seen N of lighthouse. It glared at our lights (Fleet and Mage) for over 2 min. before disappearing. It appeared was sitting on low stone wall from one of the old settlements.

28 Oct

Christmas Island, 01°S-157°E, Pacific Ocean

Two cats seen along major road, one seen at old Pacific Missile Range and the other in ditch along the road.

28 Oct

Cook Island, 01°S-157°E, Pacific Ocean

No evidence of cats noted on this island.

29 Oct

Christmas Island, 01°S-157°E, Pacific Ocean

Three cats killed by SE personnel along main road during afternoon.

29 Oct

Between the hours 1300 to 0430 following day seven cats killed and blood sampled with an additional 2 killed but insufficient blood was taken to make complete sample.
On 25 July, 1966, a cetaceous mammal (porpoise or porpoise-like whale) washed ashore on the Northwest Beach, Green Island, Kure Atoll. It was found by U.S. Coast Guard personnel at about 1300 hrs. Description is as follows:

**GROSS MEASUREMENTS**

- **TOTAL LENGTH = 4260 mm.**
- length of gape = 230 mm.
- distance blow hole from anterior point of upper manible = 490 mm.
- distance eye (ant. edge) from anterior pt. of upper manible = 550 mm.
- distance ant. edge of pectoral fin (base) from ant. pt. of lower manible = 1050 mm.
- distance ant. edge (base) of dorsal fin to posterior end of vertebrae = 1660 mm.
- distance post. end of genital pore to post. end of vertebrae = 1415 mm.
- distance post. end of anal pore (anus) to post. end of vertebrae = 1155 mm.
length of pectoral fin = 435 mm.
width of pectoral fin = 137 mm.
width of blow hole (transversally oriented) = 110 mm.
length of genital pore = 170 mm.
length of anal pore = 100 mm.
length of lateral, posterior pores (one each side of the genital pore) = 35 mm. (each)
length of fluke (tail from center of spine to distal pt.) = 520 mm.
width of fluke (tail) at widest pt. = 265 mm.
greatest circumference = 2480 mm.

BODY COLOR
dull grayish white (photographed in color)

CONDITION OF BODY
approximately dead for 24 hrs. or more with large chunks of flesh missing (shark bites) on half the tail and on the head with most all of the dorsal fin missing

MATERIAL TAKEN
measurements
photographs (color)
stomach sample (frozen)
skull

Data collected by R. Maze and T.J. Lewis.
Spawning Porpoises

Johnston Grid to American Samoa

11 Mar. Sixty-five plus spawning porpoises leaping clear of the water spotted in two groups, heading E off the port side. Individuals from 3-5 ft in length, blushed-grey in appearance were seen. Some were leaping from the water, spun or rolled completely over in the air. Long snout, snouts, and lateral fins were also noticed features of these mammals. Apparently, there was surface food in the area; soon a feeding flock of 7 birds were observed the porpoises, they being 1FT, 3ST, 1BFB and 2WTSP.