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9 April

Left Tampa at 9:45 a.m. on NAL flight 33, flying non-stop to L.A. Arrived there at 11:20 a.m. Left L.A. at 1:00 p.m. on UAL flight 1, arriving in Honolulu at 4:20 p.m. Bob McFarlane met me at the plane, and we drove up to a nearby state park before it got dark. The park overlooked the university, city, Diamond Head, etc. In and around the park were some birds new to me--Japanese White-eye, Ricebird, Indian Myna, Barred Dove, Spotted Dove, Shama, and Red-billed Leiothrix. Also saw a Golden Plover, Peregrine Falcon, and Cardinal. Talked with Chuck Ely that evening before

10 Apr leaving for Wake Is. at 1:30 a.m. (PAA 841). Arrived on Wake at 4:20 a.m.

11 Apr After breakfast we made a brief tour of Kuku Point area where a group of Sooty Terns was just beginning to lay eggs. Noted several Brown Booby nests on ground near the lagoon edge: these contained either a single pale tan egg or a large white chick--as large as the parent. There were Frigate-birds nesting back in the trees, but we didn't have time to stop and look at them. All along the road, the air strip, brackish pond, etc., were scattered Golden Plovers; some appeared to be in nearly complete breeding plumage and others in winter plumage. Noted 2 Muddy Turnstones beside air strip and 2 ducks took off from the pond. Few Common Noddies were seen out on Kuku Point.

Wake Island, 19°17'N, 166°37' E. Composed of three islets--Wake, Wilkes, and Peale arranged in a "V". 2.85 sq. miles of land, Wake having 2.14 sq. mi. Average elevation 12 feet. Dominant vegetation is Tree Heliotrope (Tornefortia argentea). Mean annual temp. of 80°F. and rainfall of 37". Today it was quite windy and there were periodic showers.

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Up before dawn. Went down to edge of ocean to look at intertidal life--mostly corals, some tube-building worms, several kinds of snails and for conchs, crabs, etc. Only an occasional Sooty Tern flew overhead. All this morning it was partly cloudy, about 80°, and a stiff E wind. Went to the brackish pond at runway: Bob noted 3 ducks and managed to shoot 1. It was a Soveler in ♀ plumage with conspicuous orange-yellow legs, feet, and bill. Golden Plovers were again everywhere, but rarely grouped into a flock. On the edge of the lagoon there was a single Wandering Tattler, about 6 Buddy Turnstones, and innumerable fiddler crabs with reddish chelae and black carapaces. One Noddy flew over. In and around a concrete remains were 2 species of gecko and 1 skink.

#1828. Pluvialis dominica. ♂ Essentially winter plumage--only a few black spots on breast. Very sparse head, neck and flank molt. Interfurcular area not full of fat. Wing 156 mm. Testis 3 mm. 127.0 g.

#1829. Pluvialis dominica. ♂ Essentially breeding plumage--mostly black underparts line above eye pure white. Appears to be somewhat fatter than 1828. Wing 167 mm. Testis 3 mm. 145.9 g.

This afternoon we went back to the brackish water pond where there were some 15 Golden Plovers and 5-7 Buddy Turnstones. It was high tide at 4:30 so water in the lagoon was high. Still, around its edges on the bare sand or mats of purslane (Sesuvium) were numerous Golden Plovers, a few Wandering Tattlers, and a teal (sp.?). Of all the plovers seen today, about 25% are in the near-breeding plumage. 75% look like winter-plumaged birds.

After dark about 8 p.m. we went out to Kuku Pt. On the way at the Mid-pac Fuel Farm (large storage tanks) we were greeted by a moderate

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sized flock of Sooty Terns flying over us in the dark. Put out on the point, there were thousands--some flying and calling, others sitting or standing all over the road and field-like area. First we proceeded to seek out nests of Brown Boobies. These were on the lagoon side of the point, above high tide level, and roughly composed of old sticks. There was absolutely no protection against sun, rain, cats or rats. The nests were usually 25-50' apart, but occasionally as close as 10'. Five nests held two eggs, 8 others had a single egg or single chick. The egg was as large as a hen's egg and was pale-tannish white with a kind of light bluish undercoat. Male boobies of this species have pale bluish bills, females pale yellow-green. Some of the chicks were getting in brown primaries, secondaries and rectrices; others were pure, downy white. The adults gave a nonmusical "qwok." At least 3 of the adults were molting their rectrices. 9 of the brooding or incubating adults were males. We then literally waded into the Sooty Tern colony--a million birds? Between us, by grabbing and catching any available bird on the ground, we banded 1000 adults in ca. 2½ hrs. Many of these were incubating adults. Only one nest that I saw contained 2 eggs. The others were 18-24" apart on the average, but occasionally 12" apart. Actually there is no nest, merely a crude shallow scraping away of debris. Each egg was tan-white with a variety of chocolate brown spots especially at the large end. I judged that some 70% of the birds I caught were nesting but Bob thought this figure was too high for the colony. In the dark it appeared as though the incubating bird was accompanied by the mate a few inches away. Usually the

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birds didn't fly too readily in the dark, but I doubt that we banded anywhere near 1/100 of the birds in the colony. Happily, there were 9 banded birds in the trench--all banded last year as adults in June or July on this island. This would suggest that some of the terns are on nearly a 10 month cycle. Although one might literally be surrounded by terns all over the ground, as soon as you started picking them up to be banded, in spite of the deafening roars, somehow or other the nearby birds on the ground would gradually leave until, after banding 2-3 birds, there might then be none in reach. I just wonder if they didn't utter a particular alarm note when being caught, thus tending to frighten many of the others away. Certainly the easiest to catch were the incubating adults, then their presumed nearby mates. I'm simple dumbfounded by the fact that all incubating adults that we've handled had 2 incubation patches, and yet only very rarely do the birds here lay more than one egg. It is not unthinkable that under some conditions--perhaps late nesting, a poor season, etc. -- they could and do lay 2 eggs more frequently. As on a previous visit we saw a feral house cat at the edge of the colony. Found a pile of several tern wings. This is likely the only serious predator of the terns, since there is an active rat control program on Wake. Noted an interesting symbiotic relationship between Brown Booby nests and hermit crabs. The crabs, large and reddish, gathered in numbers from 1-5 at the edge of the nests and consumed all or parts of the fish that the boobies disgorged. Evidently the boobies will disgorge fish even when not being frightened by men because on at least 1 occasion we found a 1 ft. fish $\frac{1}{2}$ consumed by the crabs.

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Flipper Point, Peale Is., Wake Is.

#1830. Sterna fuscata. ad ♀, fol. to 2 mm, oviduct somewhat enlarged.

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14 Apr Flipper Point, Peale Is. Wake Is.

No fat. Incubation patches refeathering. Picked up broken wing.

Went out to Flipper Point colony in morning. Here thousands of Sooties were on the ground especially around and under the tree heliotropes. Many of these terns had eggs, but there were also freshly-hatched young and young nearly fledged. Only once did I see a nest with 2 eggs. Photographed birds and habitats. Found an adult with freshly broken wing, so it became a skin. On the edge of the large Sooty Colony were scattered groups (3-5) of Gray-backed Terns. Not only were their backs different in color from the sooties but their eye lines were apparently longer and the call note a more melodious "coo-oo" instead of the Sooties' strident "cree-ck".

Found a dead Gray-back young and one just beginning to fly. Over the water were occasional crown Noddies and two small Hawaiian Noddies. It seemed to me that this sooty colony covered more ground and contained more birds than the one visited last night on Wilkes Is. Saw no frigate-birds here today. Along the road and even back among the tree-heliotropes were scattered Golden Plovers. Spent part of the afternoon skinning the Sooty Tern and Shoveler. Later in the afternoon we rode along the road just next to the main runway, counting Golden Plovers. Along about 3000 ft. we noted 8 Golden Plovers. All these right beside the road and fairly evenly spaced out! Of these 1 was in "high" plumage, one nearly "high", and the rest in winter plumage. After supper we went back to Kuku Point, and just as dusk watched the hordes of Sooty Terns mostly in the air. (There was also a large number in the air at the Fuel Farm.) Mostly these birds are flying into the prevailing winds--easterly. We went to check the

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Brown Booby nests, but it was still too early and most of the adults wouldn't permit capture. Did catch 3 more however. One of these was the ♂ mate to a ♀ caught last night. She was lying beside the nest dead--a badly injured forehead--while the ♂ incubated the single egg. Between 8 and 12 we banded 1500 more Sooty Terns in the Kuku Pt. colony. This area was completely denuded of all vegetation but the grass and forbs are gradually getting underway in secondary succession. (This would be a fascinating study all by itself.) The Sooty Terns select for their nesting areas the bare, sandy areas between plants. Occasionally there was a nest in or under a large grass clump. Tonight the nests seemed to be closer together, but this may be just imagination. On one occasion I noted 2 nests so close together that the tail feathers of incubating parents touched. Again, I saw only one 2 egg clutch. We caught 14 birds which had been banded on Wake last June and July.

15 Apr Weather is rather monotonous here. There is a constant E or SE trade wind, partly cloudy skies, and and temp. in the 70's. Occasionally there is a light, brief rain shower, but , so far, we've been inside during most of these. Last night it did rain lightly on us while we were banding, but it was of little consequence.

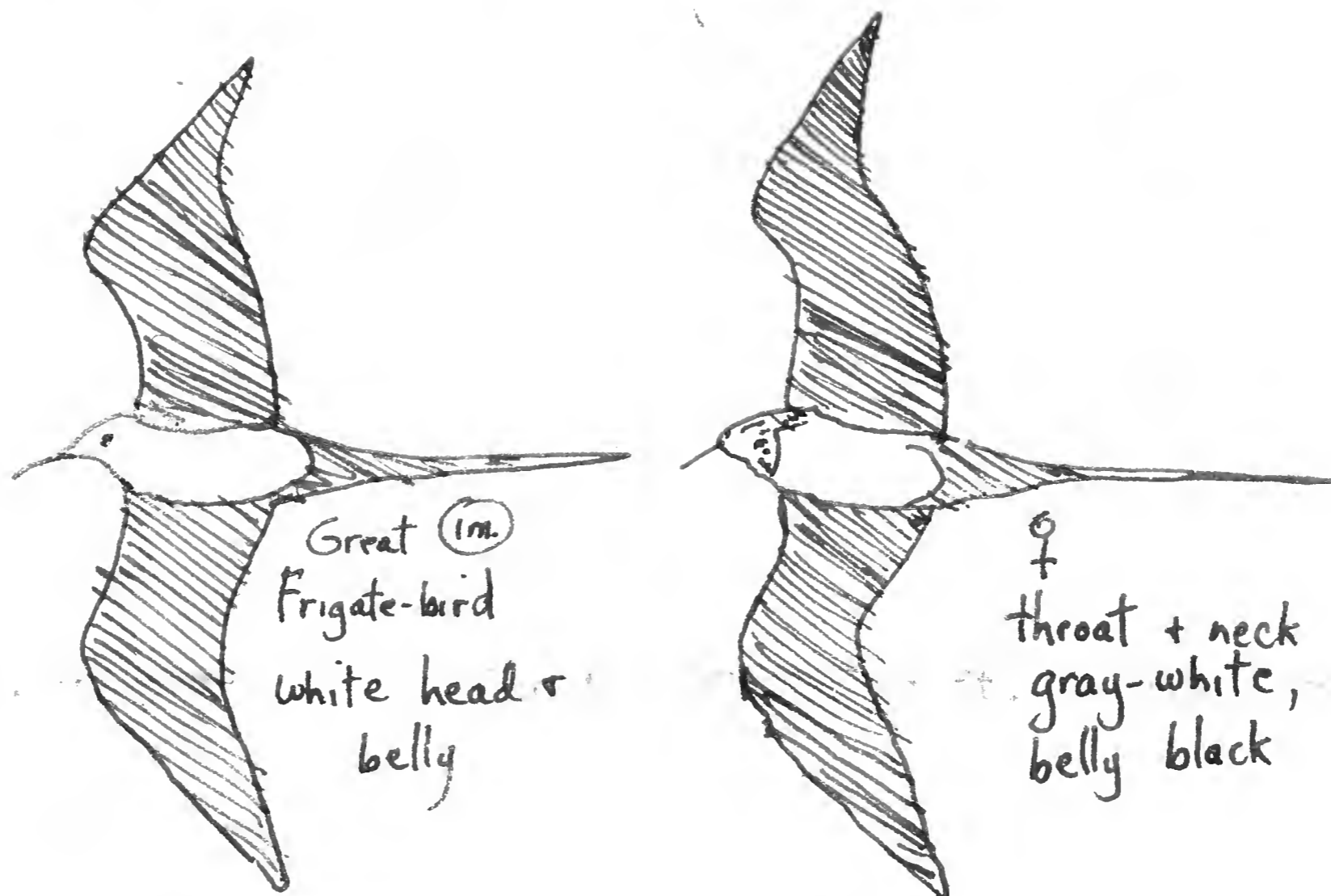
Early this morning (6:30) we got up somewhat wearily, sore and bruised from last night, and drove out to the Flipper Point ternery. On some of the projections, floats, etc. out in the water were at least 9 Great Frigatebirds of both sexes and a few noddies. Near the old seaplane ramp Bob spotted a single Noddy nest about 20 ft. up in a tree-heliotrope. One adult was standing in the nest which was composed of a fairly loose mass

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of sticks. Bob thought it might be the Hawaiian Noddy. This species is smaller than the Common Noddy and has a shorter, light gray tail. In the large ternery on the point we were especially looking for Gray-backed Terns. In all, we noted about 150, always on the periphery of the ternery, though we never saw any physical conflicts between the two species. We were especially looking for nests of the gray-backs and succeeded in finding at least 2. They were located out under the trees in a tangle of low branches on the ground. We found them by watching carefully for a gray-back working its way out of the tangle. Each nest contained a single egg which, in comparison with Sooty Eggs, appeared to be smaller, less pointed (more ovate) and perhaps with a slightly more tan background color. In contrast to most sooties, these incubating gray-backs did not sit tightly but rather flushed when we were 50' away. Why aren't more gray-backs nesting?--many were just standing around out on the point and very occasionally courting. Then, why were there some nearly fledged chicks seen yesterday? Evidently this species is like the sooty in that different individuals--at least in the Flipper Point colony--are in far-removed different reproductive stages.



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15 Apr About 10 a.m. we drove out beside the 9000 plus ft. runway toward Kuku Point.

The weather was hot, sunny and windy: weathermen predicted a high of 85 today. Beside the road and airstrip were 5-8 Golden Plovers. Four were shot with .22 pistol and rat shot.

#1831. Pluvialis dominica. ♀ follicles 1 mm. Essentially winter type plumage with about 2 doz. scattered spots in breast and abdomen. Some body molt. Wing 159 mm. 146.7 g.

#1832. Pluvialis dominica. ♂ testis 3 mm. About 3/4 breeding plumage. Wings worn. Heavy molt. Wing 166. 121.9 g.

#1833. Pluvialis dominica. ♂ testis 3 mm. About 3/4 breeding plumage. Wing 162 mm. Heavy molt. 145.6 g.

#1834. Pluvialis dominica ♂ testis 3 mm. Essentially breeding plumage with only a few scattered white abdominal features. Wing 165. Molting. 151.2 g.

All these birds appeared to have heavy depots of intraperitoneal and subcutaneous fat. Subjectively, it seems to me that the plovers are getting less common on the island. Out at Kuku Pt. we parked the jeep beside the lagoon. Water was at low tide. We waded through thigh-deep water to the rocks on which Common Noddies nested last year and on which there were a dozen or more perched today. There were eleven nests each with one pale tan egg. Nest was a small (12" across) mass of sticks, very crudely constructed. On other rocks nearby Bob found 2 more nests, on one of which a Brown Booby was sitting. Intertidal life abounded with many corals, few starfish, large (12 plus ") black sea cucumbers, parrot fish, morays (up to 2 1/2'), blennies, flounder, etc.

This afternoon there was a noticeable decline in numbers of shorebirds

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on the island. Whereas 2-3 days ago around the lagoon edge, especially the SE end, we saw numerous Golden Plovers, turnstones, and a few tattlers, today there were none of these to be seen at this point. In fact, a search of a larger area showed only a couple dozen Golden Plovers and very few Turnstones. Thus, at least the g. p. must be taking off on their long overseas flight at this time molting heavily--see specimens of today.

One of the workmen told me today of the presence of sparrows on the island, one of which he has seen (last evening). According to his story someone brought a pair (?) of "common sparrows" ("same as in U.S.") on the island and released them recently. The one he saw came to feed at the Pan Am Club late last evening, and from his description could have been a female House Sparrow.

14 Apr #1835. Sula leucogaster ad ♀, fol. to 5 mm. Found dead at nest; injury on forehead. Feet, bill pale greenish-white. Very littler fat.

15 Apr Tonight Bob went out to the Flipper Point colony and banded 1000 Sooty Terns, about 45 Gray-backed Terns (ad. and yng.). Then about 10 adult Common Noddies on the rocks at Kuku Pt. Also roosting on these rocks at night were a few Brown Boobies but they weren't caught for banding.

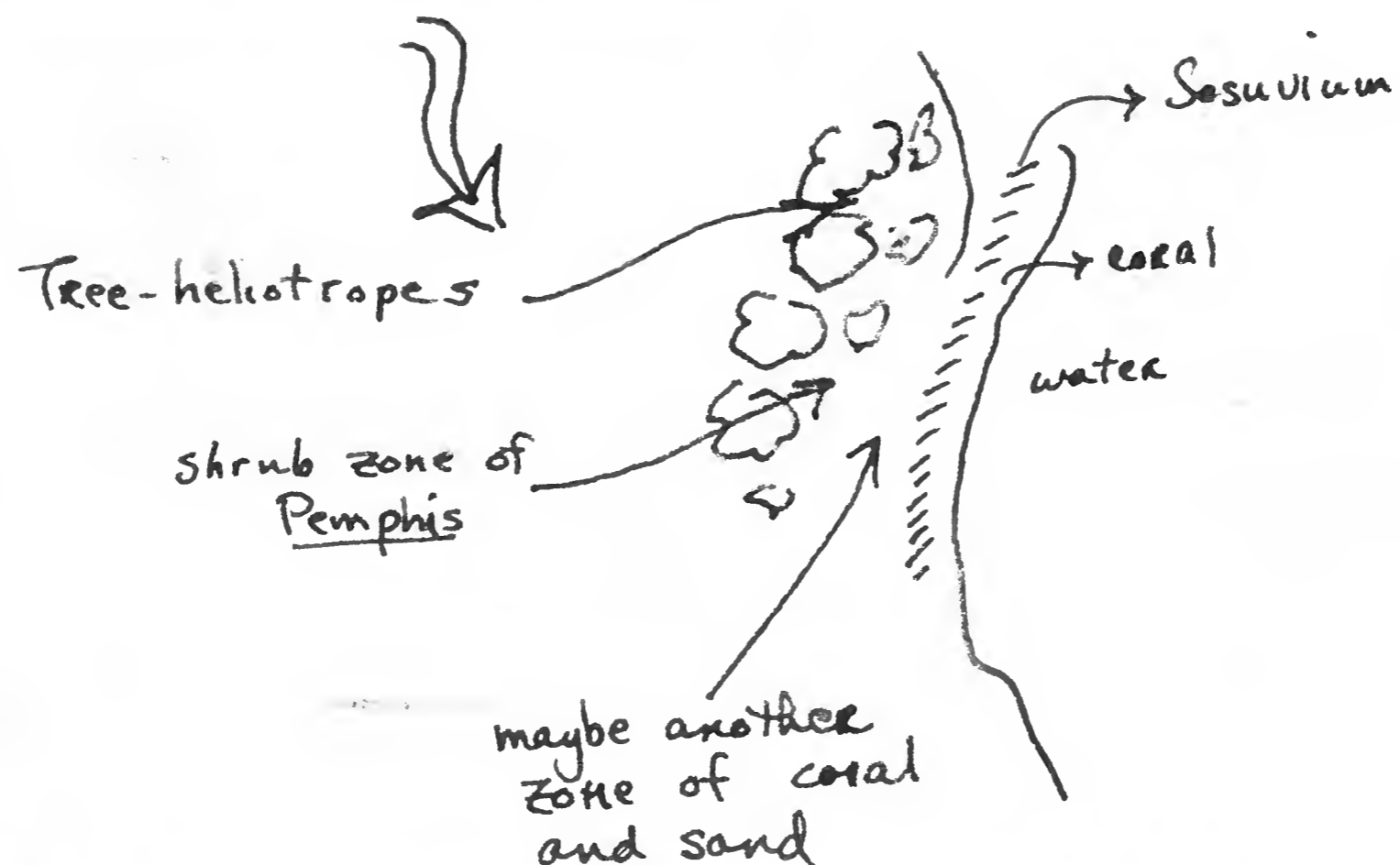
16 Apr This morning I took a drive to sand flats of lagoon, then on around lagoon edge and airstrip edge to the W end of the airstrip, back along the S edge of airstrip to Peacock Pt. and return. On sand flats tide was going out--saw scattered 25 Golden Plovers, 3 Wandering Tattlers, and 2 Buddy Turnstones. A ♂ Great Frigate-bird flew directly overhead; it was solid

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black except for a brownish throat. Along the lagoon edge I was impressed by the concentric zones of plants.



All along the airstrip and occasionally beside the road were scattered plovers. Probably there are 150-200 of these plovers on the island. Many are still rather evenly spaced out along the airstrip, as they are apparently all winter. Perhaps these constitute winter territories. At noon we went back to Kuku point. Over the Fuel Farm we noted the usual masses of Sooty Terns overhead. Then some distance away and partly over the ocean we saw some all-white birds, about 5 of them at first. These turned out to be Red-tailed Tropicbirds and at least 1 White-tailed Tropicbird.¹ (see next page, illustration I) At a little later on, tropicbirds numbered probably as many as 10 over the point, but it was hard to count them because they wheeled and sailed so far so fast. We got to the point at a good low tide and waded out to the rocks where the Common Noddies were nesting. There were 11 nests on the one rock; birds were easily photographed and each egg was measured. Went over and photographed Brown Boobies. In some cases one was incubating. When I got too close one parent would seize a twig in its bill, a

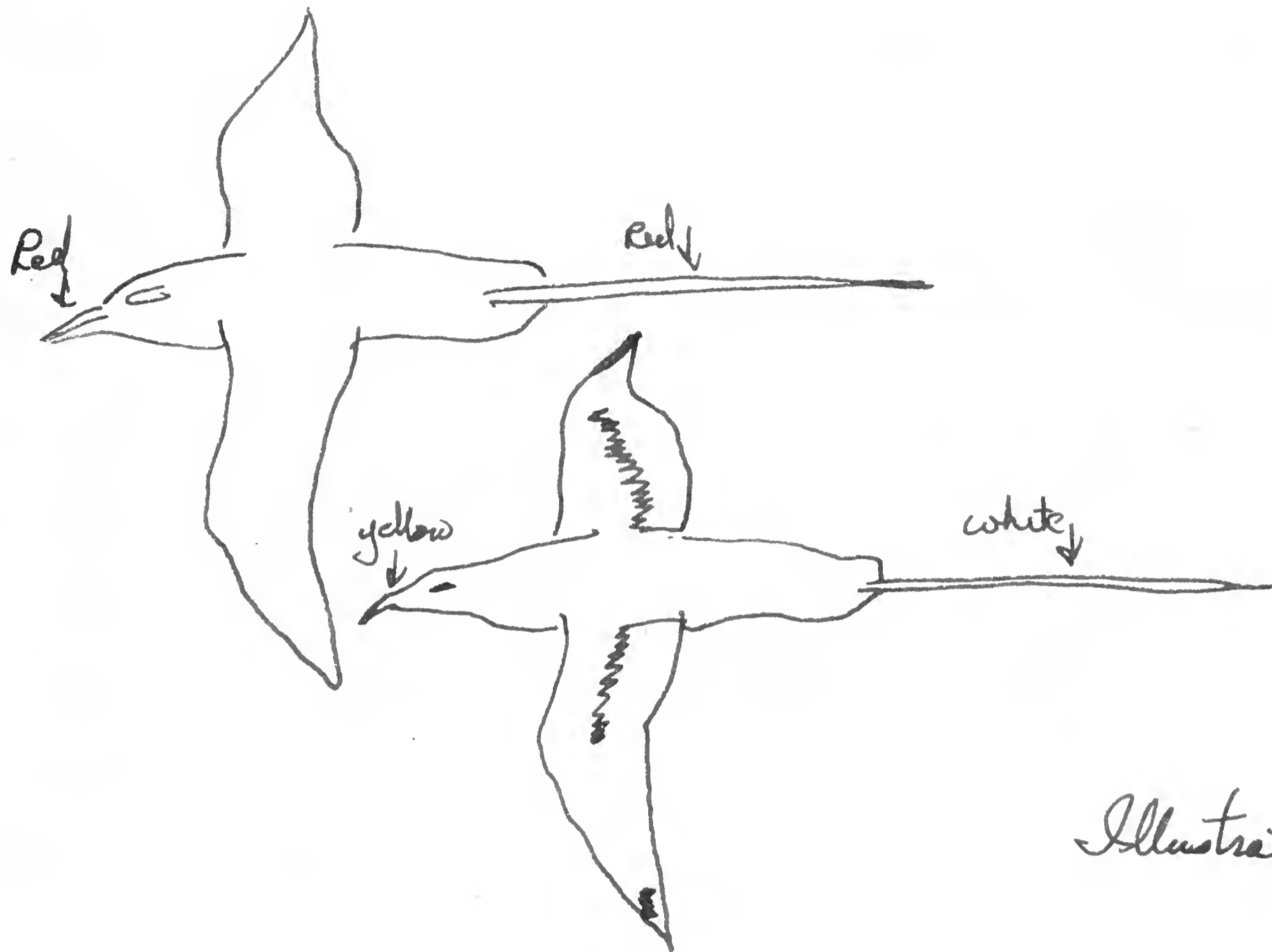


Illustration I

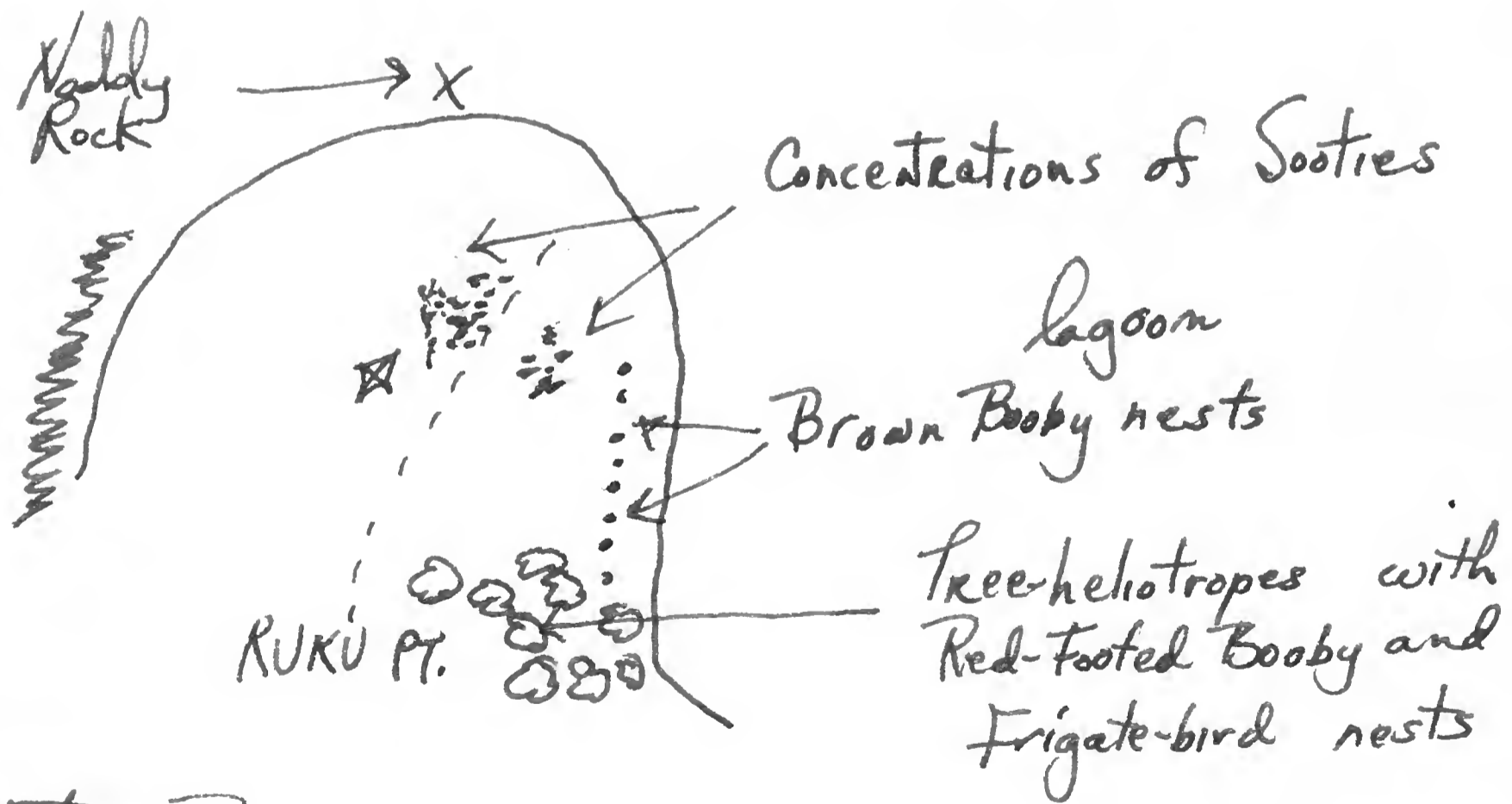


Illustration II

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displacement action. ♂ has bluish tinge to bill, ♀ paler green. Came back to Sooty Tern colony and picked up 64 dead ones on the road--hit by cars. They are loather to move from their stance when cars come along. (Illustration II, previous page.) Came back to tree heliotropes containing Red-footed Booby (3-4?) nests: some had young--large gray-brown. One adult had white head with bluish cast to bill, pink forehead and base of lower mandible. Frigatebirds appeared to be mostly ♂♂ with red gular pouches inflated, but there were also ♀♀ and im. One immature had a white chest but red gular pouch. Drove back along airstrip trying to get Golden Plovers but they were extremely shy. Got only 2. Although there were good numbers present, even small groups of 7, 16, 9 and 9 on the runway, we wonder if these birds haven't come in since day before yesterday because at that time there were very few out on the lagoon flats. This afternoon there must have been 50 or more including a Dunlin and some more Tattlers.

#1837. Pluvialis dominica ♂ testis 3 mm. About 3/4 breeding plumage; still some white areas on abdomen. Heavy molt. Wing 163. 152.8 g.

#1836. Pluvialis dominica ♂ testis greater than 1 mm. Essentially winter type plumage with ca. 8 spots on chest and abdomen. Wing 163 mm. Heavy body molt. 125.1 g.

Both birds appear to have much fat in and associated with abdomen.

Notes taken from F. R. Fosberg's "Vegetation and flora of Wake Island".

Most of the atoll is covered with an open scrub forest, mainly of Tournefortia argentea. Soils are generally coral gravel or rubble or of coral sand with slight, scattered traces of humus. Vegetation affected

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by droughts and typhoons; also Wake was nearly totally devastated by military activity between 1941 and 1945.

Where the salinity is too high, Pemphis and Sesuvium form the normal vegetation.

Tournefortia woodland is a fairly stable stage; undisturbed it may give rise to Pisonia or Pisonia-Cordia forest. Tournefortia colonizes successfully bare sand and gravel, so it may immediately succeed itself if destroyed by storms.

Some plants: sand spurs, Bermuda and crab grass; Pisonia (Puka-tree with greenish flowers); Sesuvium portulacastrum (seaside purslane); dwarf poinsettia; Pemphis acidula (tree or shrub with white flower);

17 Apr In morning we went out to Euku Point. Partly cloudy and intermittent rain later on until early afternoon. Went into Tournefortia woodland looking for Red-footed Booby and Great Frigate-bird nests. There were 15 of the booby nests in 6-8 trees, some trees containing as many as 3 nests. Each nest was a simple platform of sticks which you could see through from below. Evidently each occupied nest contained an egg--adults were sitting tightly. In one nest there was a large, white downy young--differed from Brown Booby young by having blackish bill. An adult instead of being essentially black and white, was of the dusty plumaged color phase. These boobies generally set closer than did the frigate-birds but were less prone to return once they had flown off. The adult came in and regurgitated a fish for the yng. booby. All nine of the frigate-bird nests were in 2 trees, 10-12 feet off the ground. These trees were also occupied by at

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least 3 of the booby nests, and insofar as we could notice there seemed to be no conflict between the two species. The frigate-birds had an interesting call, one which closely resembles that of a screech owl. In most instances 9 frigate-birds were incubating though one subadult ♂ was also seen incubating. We noted the presence of at least 50 frigate-birds in the air or roosting in the trees. This included some adult males (solid black), subadult ♂ (red gular pouch but white chests), females (brown throat, white chest and abdomen), and "immature" birds (white heads, chest and abdomen). They are noticeable nest robbers. As soon as one bird would fly off the nest, others would come and sweep the nesting material by swooping down and taking sticks in flight. One ad. ♂ sat tightly back under the tree about 7 ft. off the ground. We kept it from flying with a stick and captured the bird. Bob dissected it for sperm, then made a skeleton of it. It was surprising to see this number of frigate-birds at the "colony" but so few nests. Even at a distance we could easily see the louse flies crawling all over these birds: in fact several flies lit on my arm. From this colony in the woodland, while Bob was skeletonizing the frigate-bird, I walked out on the reef at low tide on the S and W side of Kuku Pt. Even at low tide there was not much to be seen in the tide pools--both black and brown sea cucumbers, numerous blennies and other fish, an occasional small moray eel (one was banded just like some Matrix water snakes), many crabs, including hermits, snails and other mollusks. At a point about 20 yds. from the "Common Noddy rock" there were some Journefortia trees growing above the high tide mark. I had

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noticed 3 Red-tailed Tropicbirds flying around over head and proceeded to get out telephoto lens. However, to my surprise about 100 feet from me they lit on the ground near a clump of these trees. As I approached, I noted 3 birds sitting on the ground under the trees, one birds almost under the roots. They made some croaking notes to each other or toward me but otherwise remained on the ground. I even succeeded in easily catching a bird which we brought back and banded. At least 2 more were seen overhead, so there were at least 5 birds here. On the way back we saw only 3 Golden Plovers beside the road and no flocks out on the runway. Started to rain heavily.

#1838. Pluvialis dominica. testis 7 mm. Essentially in winter type plumage--ca. 2 doz. black spots on chest and abdomen. Heavy body molt. Wing 169. 157.6 g.

#1879. Pluvialis dominica. testis 3 mm. Essentially breeding plumage. Body molt Wing 166. 162.1 g.

Today, our observations indicated fewer plovers on the island than yesterday! Recall that yesterday we noted small flocks of plovers on the runway as well as goodly numbers on the lagoon, sand flats. But today on the airstrip were only scattered "singles", perhaps 20 birds in all. And on the sand flats Bob saw 4 plovers, 4 turnstones, and 4 tattlers. Thus, it appears that right before our eyes plovers are migrating off this island, and it is possible that "new" ones are coming in almost daily from perhaps more southerly points. It is also of interest that these plovers are in 2 plumage type --either full breeding or "winter" type. I just wonder

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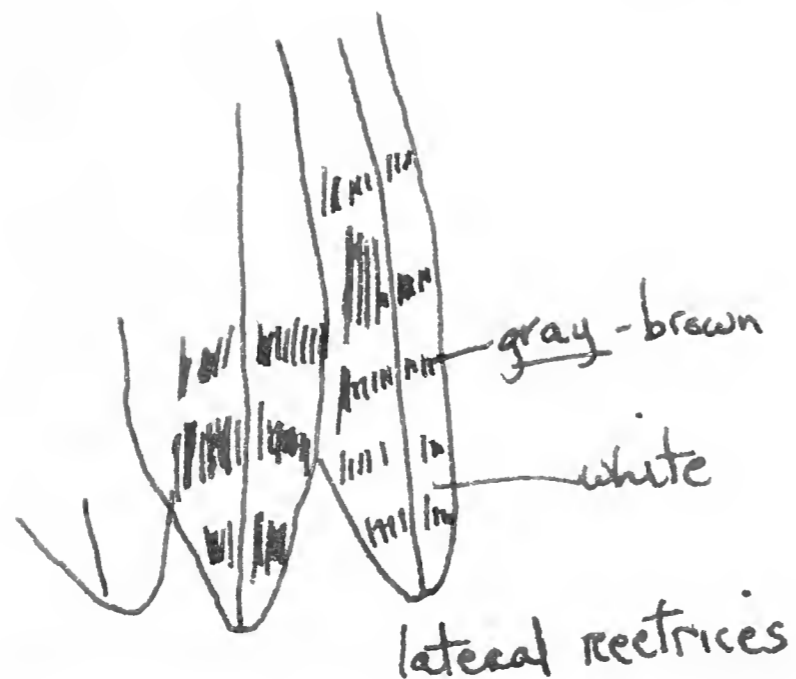
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if the "winter" types don't constitute a subadult bird. In the afternoon despite the intermittent shower activity we went back to Kuku Pt. to look for the tropicbirds. Returning to the same clump of Tournefortia trees we found 2 Red-tailed Tropicbirds under the one tree. One bird was sitting far back under the tree on a single egg which was almost red-brown with dark brown blotches. This adult, as well as the other adult and its chick--some 8 feet away under the same tree--all these 3 were banded by Bob. The chick was all white and had a black bill. All these three birds gave menacing, raucous cries as they were being caught, and the adults tried to jab fiercely with their bills. We noted that the adults' feet were black and their tarso-metatarsi were gray. It is possible that this is the first recorded breeding of this species on Wake Is. About 20 ft. in front of the nest containing the egg was a dead tropicbird of this species. We suspect a cat had killed it. It was nearly completely skeletonized, but was too much broken up to save. Rain continued, occasionally heavily, through the evening.

18 Apr There was heavy rain and wind all night long, and threatening rain in the morning.

#1840 Pluvialis dominica ♂ testis 5 mm. Breeding plumage 192.1 g.

Wing 165 mm. Sparse body molt. Fattest plover I've seen yet



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Spent most of the morning getting nets, poles, etc., ready, but when we tried to string the nets over the brackish water pond, it was impossible. The wind was just too strong. Immediately thereafter we gave out of gas and had to walk back. I walked back at the edge of and across part of the sand flats at the end of the lagoon. In so doing I saw no more than 10 Golden Plovers, 3 Tattlers, and 4 Turnstones. That is, until I noticed at 3 p.m. $\frac{1}{4}$ mi. away a flock of 16 Golden Plovers rise from the sand flats and fly straight out of sight over the NW corner of the lagoon. They did not circle but simply gained altitude straightway and disappeared from my view. It seems quite likely that they were beginning their long overseas migratory flight. About $\frac{1}{2}$ later I found a flock of some 44 birds standing and sitting quietly on an "island" of Sesuvium out on the flats. It may be anthropomorphic to state that they appeared to be resting--they weren't feeding or even walking around as single plovers were doing out on these flats or along the airstrip. When I flushed these birds, they broke into two smaller flocks and simply flew farther out on the sand flat where they settled down again. This group contained birds in several degrees of breeding plumage--all the way from "winter" type to full breeding type.

Just before dark we went out to band terns on Flipper Point. To our surprise a large group of sooties had come across the "dry" inlet (separating Flipper Point from Peale Is.) over on Peale. They had already started laying fresh eggs on the coral sand between the grass clumps and between the Pournefortia trees. These birds were most unstable, however, probably because of the fresh eggs and couldn't be

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caught readily. We went on over to Flipper Point for banding. Banded 1000 sooties, 9 Gray-backed Terns (1 large chick), but banding tonight was not very good. This was probably because of a moon glow through the clouds, so that the terns could see us easier and thus were more difficult to catch. At one point in the colony there were many newly hatched (today) chicks, and here and there in the colony were older chicks running around in the dark. Mostly, though, adults were sitting on their single eggs. So far this year we have had 36 returns of Sooty Terns, banded last year here at Wake. Tonight we got a couple that we banded over at Kuku Pt. This year. We both noted the more aggressive nature of the sooties tonight--many adults not only jabbed with the bill or threatened with open bill, cries, and spread wings but also readily attacked the light or our legs. Found at least $\frac{1}{2}$ doz. dead chicks; also 12 dead sooties on the beach. Sounds like human visitors before us.

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Today the weather was superb: partly cloudy with cumulus clouds in a blue sky, strong SE winds, warm and sunny. In the morning (unday) we went out to the Flipper Point ternery. Yesterday I had moved an extra egg into each of 20 nests, thus 2 eggs/nest instead of 1. Today none of these nests was being incubated, but I suspect one of the reasons was the fact that the original egg (yesterday) was fresh and had been placed too close to the road (greater disturbance from human traffic). We photographed birds in the colony, particularly looking for Gray-backed Tern nests back under the trees. Found 2 such nests each with 1 egg and saw several nearly-fledged yng. under the trees. The adults proved to be too wary to be photographed; they won't sit tightly like the sooties. Around this

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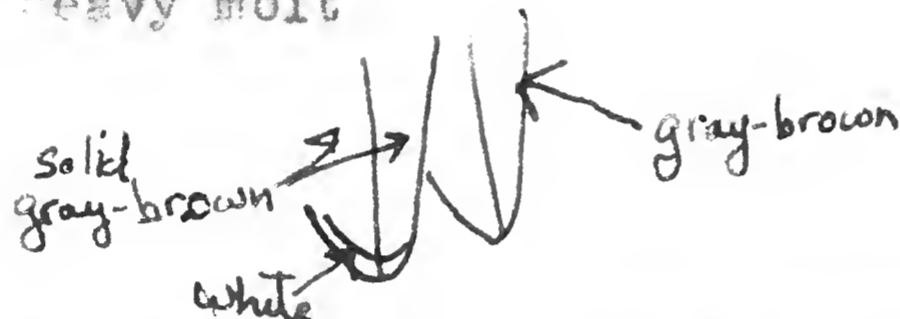
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huge ternery of perhaps 200,000 birds were some 150 Gray-backs and some 4-5 Brown Noddies, the latter evidently not nesting here. Just as we drove over the bridge we saw a single Fairy Tern flying along. Got a good look at the bird. Though it didn't stop anywhere. On Toki Point fishermen were bringing in large flounders, using fingerling mullet for bait.

#1841. Pluvialis dominica. ♀ fol. 1 mm. 166.3 g. $\frac{1}{2}$ breeding plumage.

Wing 165 mm. Heavy molt



#1842. Pluvialis dominica. ♂ testis 5 mm. Essentially breeding plumage.

151.5 g. Wing 165 mm. A little molt. Tail like 1840.

Golden Plovers still present on island in moderate numbers--8 or 10 spaced out on either side of airstrip, scattered birds out on lagoon sand flats, two small flocks (7 and 6), and others scattered around on the island. Also noted 4 turnstones, 1 Tattler, and a dunlin. Just after noon we saw a White-tailed Tropicbird flying near the control tower. We also returned to the Red-tailed Tropicbirds' nests on Kuku Point. This time the same adult as before was incubating the egg but a different unbanded adult was brooding the chick.

Had report of "the" sparrow at Pan Am Club ca. 7:15 in evening. From the description given me the bird was apparently a ♀ House Sparrow.

In the evening we went out to Kuku Pt. to band terns, but it began to rain lightly and the moon was periodically too bright to catch the terns. We therefore contented ourselves with eradicating 5-6 cats from areas surrounding the ternery.

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Today was beautiful weather; indeed, the wind died down somewhat about noon and it was noticeably hotter in the afternoon. Spent part of the morning working on Sooty Tern hearts. About 3 we rode out toward Flipper Point. Near the bridge over the inlet into the lagoon we noted 3 White-tailed Tropicbirds. All 3 flew fairly low over the trees then wheeled high above us for several minutes. From the time we reached the bridge we could see the swirling mass of Sooty Terns out toward Flipper Point. Drove to this colony. The one over the Point seemed to contain many more just-hatched chicks. Spent the remainder of the afternoon looking at vegetation of Peale Island--trees shrubs, and herbs being identified. There were at least 2 plants which appeared not to be in Fosberg's list. Found several more nests of Common Noddy near the old seaplane ramp area. Two were in Tournefortia trees and five were being constructed atop some old steel-and-concrete beams--the remainder of an old building's upright wall.

Went out to Kuku Pt. colony at about dark--banded 1500 tonight. The birds are more and more occupying the eastern side of the road, whereas a week ago they were restricted to the western side. A few birds sitting on 2 eggs. I got 11 recoveries, and Bob got some that we banded on Flipper Point this year.

Status of Sooty Tern colonies on island today:

1. Kuku Point

- a. Western side of road--the older of the two on this point. Whether still growing? Birds in constant low mass.
- b. Eastern side of road--newer of the two, and still growing. Probably density of nests is not at a peak.

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2. Fuel Farm. Several thousand birds still in their vertical swirl. No evidence yet of nesting.
3. Flipper Point. Oldest and perhaps largest colony. Contains fresh eggs, some incubated, new chicks, old chicks.
4. Peale Is. mainland just across "inlet" from Flipper Point. Growing more and more, with more fresh eggs each day. Here, birds did not return to incubate the two-egg clutches.

21 Apr Piding back from Kuku Pt. about 1 a.m. we noted several Golden Plovers beside the road. Evidently these birds roost at light out on these grassy plots beside the airstrip. In the morning we visited the Peale Island ternery and got 10 terns for heart studies. Later in the afternoon we went into the Flipper Point colony to band chicks, but to our surprise there were relatively few. We banded only about 225, most of these being newly hatched--still in the nest. There were, in addition, some older chicks running around in the colony; some of these could fly a little. As they wandered around they frequently received sharp jabs from adults sitting on eggs. It was quite hot, and adults were covering eggs or young tenaciously. Also, the adults were most belligerent toward us. As we reached to band a chick, the parent would dart forward with sharp cries, spread wings, and a sharp bill. Several times adults hit me in the head and once, a bird even lit on my back in trying to defend its chick. Usually the chick, after being banded and if it were dry, would begin to run away from the nest.

About 4 p.m. we were watching birds over the sand flats at the lagoon. At 4:30 we saw about 9 Golden Plovers rise from the flats and as it gained altitude the flock was joined by about 15 others. These, then, began to

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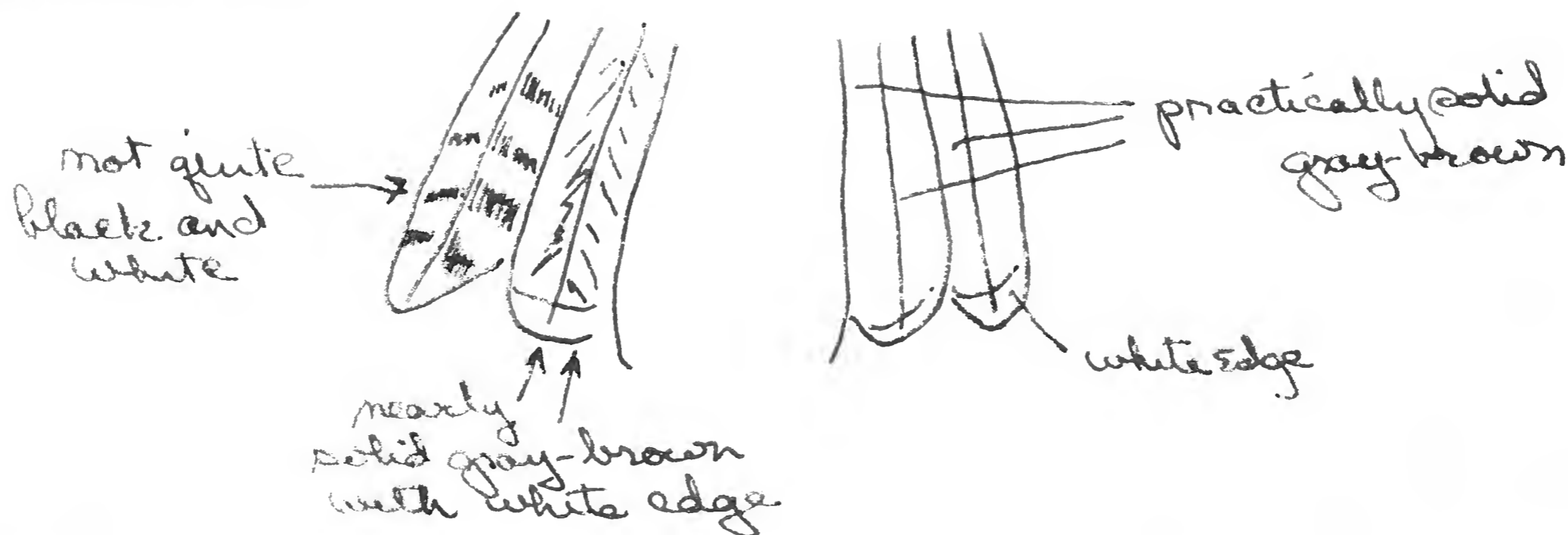
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21 Apr

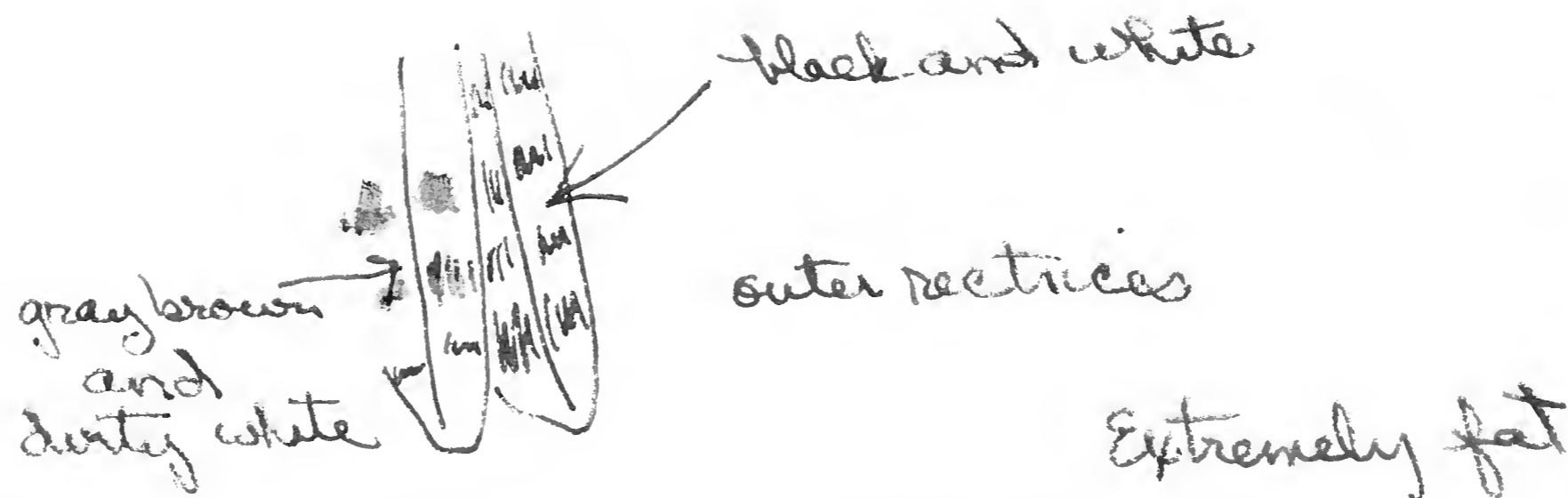
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circle, picked up some other plovers until the flock numbered about 30. They were looking directly westward. The birds continued to wheel and circle higher and higher above the lagoon. I watched them for about 5 minutes until they were out of sight. They were probably a mile high and 2-3 miles away from me. I have no doubt that they were beginning their migratory flight. We then proceeded to look for Golden Plovers along the runway. On the N side we noted about 6, in various plumages and fairly evenly spaced out. Over the entire sand flat there were 25 Golden Plovers, 1 Dunlin, 6 tattlers, and 4 turnstones. Thus, gradually it appears that the plovers are thinning out on the island.

#1843. Pluvialis dominica. ♀ follicles 1 mm. 164.6 g. Wing 164 mm. About breeding plumage. Heavy molt. Outer rectrices not bilateral. Extremely fat.



#1844. Pluvialis dominica. ♂ testis 4 mm. Essentially breeding plumage. Still some white on throat. 155.7 g. Wing 170 mm. Moderate molt.



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Collected 2 Common Noddies from old building wall on Peale Island where this species was constructing nests--about 5 of them--on the leeward side of old steel beam.

#1845. Anous stolidus. ♀ incubation patch, 1 collapsed follicle. Heart wt. 2.05 g. W¹. 230.6 g. A little fat.

The other Noddy, a ♂, prepared by Bob weighed 199.2 g. Ht. wt. 2.15 g.

#1846. Pluvialis dominica. ♂ testis 4 mm. About $\frac{1}{2}$ breeding plumage.

Heavy molt. 132.1 g. Wing 159 mm.

#1847. Pluvialis dominica. ♂ testis 4 mm. Almost breeding plumage. Molt moderate. 148.7 g. Wing 160 mm. Tail not bilateral in its color pattern.

#1848. Pluvialis dominica ♀ follicles 1 mm. With #1847. Nearly winter-type plumage, with ca. 12 black spots on abdomen and breast. 122.5 g.

Heavy molt. Wing 165 mm. Tail like #1846. S side airstrip!

This afternoon it appeared to us that there were more Golden Plovers on the island than were present yesterday. For example, as opposed to yesterday, today there were (a) about 20 scattered along the edge of the airstrip, (b) a flock of 9 on the airstrip, and (c) 73 scattered out on the sand flats of the lagoon at high tide. Could it be that we are having a rather constant turn-over of migrants; that is, migrants arriving and leaving perhaps daily? Also on the lagoon sand flats were 2 Turnstones and 4 Pottlers. On the brackish water pond were 2 plovers and a turnstone in breeding plumage. The Golden Plovers today appeared to be about $\frac{1}{2}$ in breeding plumage, $\frac{1}{4}$ in essentially winter-type plumage, and $\frac{1}{4}$ changing. Near the control tower we saw 2 Fairy Terns flying high, then drifting

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out to sea. About 4 p.m. a Pan Am Boeing 707 on landing here took a Sooty Tern into one of its engines. Fortunately the engine "went out" after the plane was on the ground. Estimated damage was \$300,000. Engine was replaced here, requiring some 7-8 hours delay.

#1849. Sterna fuscata. sex? juv. Found dead in colony. downy chick.

#1850. Sterna fuscata downy chick. Found dead in colony.

Went out to Flipper Pt. colony this morning about 9. Weather was overcast, but moderately strong wind. First, we banded chicks in one part of the colony where they were just hatching. Adults guarding and brooding chicks were aggressive--would readily peck hands and attack with wings spread. This was also true of many adults sitting on eggs, and we presumed that their eggs were ready to hatch. Saw some eggs just pipped. Also the usual 20-30 fledglings (near adult proportions but practically solid black in color) moving about and occasionally flying in colony. Then we set about counting eggs by using rectangular (100' X 10') transect string. This was marked off at 10' intervals, so that each transect yielded 10 100 sq. ft. quadrants.

<u>Quadrat (100' X 10')</u>	#1	#2	#3
	31.6 nests/ 100 ft ²	16.9	26.6
	$\bar{x} = 25 \text{ nests}/100 \text{ ft}^2$		

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This afternoon there were evidently only 8 Golden Plovers and 1 Tattler on the island! At least these are the totals that Bob obtained along the airstrip and on the lagoon sandflats. Note sharp reduction in numbers from yesterday.

#1851. Pluvialis dominica. ♂ testis 4 mm. Breeding plumage. A little molt.
146.3 g. Wing 171 mm.

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nearly black and white

Very fat.

N. side air strip

less distinctive bands - more solid

#1852. Pluvialis dominica. ♀ fol. to 2 mm. About $\frac{1}{2}$ breeding plumage.

Heavy molt. 172.3 g. Wing 166 mm. Tail like #1841. N side air strip.

Excessively fat.

The weather turned quite nasty late in the afternoon and evening--
overcast, light rain, 20 mph E or NE wind. No banding tonight.

Banded 400 Sooty Terns chicks in all at Flipper Pt. colony.

April	<u>sunrise</u>	<u>sunset</u>
5	0644	1908
10	0640	1910
15	0635	1911
20	0632	1913
25	0628	1914
30	0625	1916

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In morning weather was much better (as usual, partly cloudy, sunny, E trade winds) than rain and wind during night. Drove around airstrip, noting only 9 widely scattered Golden Plovers. On lagoon sandflats were 2 Golden Plovers, 1 Turnstone, and 4 Tattlers. On way out to Peale Island near bowling alley we noted 3 Fairy Terns; same general area where we saw one earlier. It looked like there was a pair that stayed rather close together as they flew around plus one "odd man". There was some chasing among the birds. On two separate occasions they came down to some Tournefortia trees, fluttered among their branches, and briefly

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settled down. Whether they are now or are going to nest, we do not know.

Went on out to Peale Is. ternery where I used a 25 ft.² frame as a quadrat to get density of Sooty Tern nests. Took 105 quadrats and the average $\frac{\# \text{ nests}}{25^2}$ or $\frac{32.7}{100^2}$ is a greater density than we got in the Flipper Pt. colony yesterday.

#1853. Pluvialis dominica. ♂ testis 7 mm. 190.5 g. Essentially breeding plumage. Wing 176 mm. Molt nearly complete.

#1854. Pluvialis dominica. ♀ fol. less than 1 mm. 153.7 g. Wing 166 mm. Essentially winter plumage with ca. 2 doz. black spots on belly. Heavy molt. Outer rectrices all solid gray-brown. N side air strip
Tonight it rained between 7-9, then the moon came out very bright so banding terns was out of the question. We went out to the Kuku Pt. colony about 10, though, and succeeded in killing 2 cats feeding in or near the colony. One the way out we saw at least 3 Golden Plovers beside the road; they were wary and usually flew as the headlights hit them.

Density of Sooty Terns on Peale Island came out to be about 200,000 birds. The area on Peale occupied by these terns was about 45 X 700 yds or 283,500 ft.²

25 Apr

Weather again very pleasant in morning on way out to Kuku Point we saw only one Golden Plover beside the airstrip. At old submarine channel there were 23 frigate-birds sitting on a wire between two "telephone poles" but they flew readily as I approached. At Kuku Point Sooty Tern colony

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I counted number of nests in 100 25 ft.² quadrats--50 on west and 50 on east side of road. The number of nests was greatly influenced by the covering vegetation--the greater the nests the greater the exposed area of coral sand. Or, the more the clumps of grass and forbs, the fewer the number of nests. A cursory glance at these data indicate an average of about 6-7 nests/25² quadrat or 24-28 nests/100 ft². Based upon these data and the possible area occupied by the birds, there may be as many as 300,000 birds in the one colony alone. There were a great many birds, both today and last night, sitting or standing at the edge of the nesting area. In fact these standing birds appeared to be denser than the nesting area birds, and perhaps they were the mates of the birds currently incubating eggs.

Went over to Flipper Pt. colony about 10:20. Located 2 Gray-backed Terns nests, each with single egg and more under vegetation than many Sooty Tern nests. The gray-back egg measured 44.4 X 32.7 and 43.0 X 33.2 mm.

#1855. Fattus ♂ 245-133-26. Dead in road beside coral rubble and tree-heliotropes.

Went out after lunch; it started to rain. Along N side of airstrip I saw only 2 Golden Plovers but a short time later a flock of 6 went over. Then, out on the lagoon sandflats there was a roving flock of about 25 Golden Plovers, these being "nervous", flying around a good bit, and calling more than usual. They gave evidence of being a migratory flock, for certainly they were not present yesterday. As I tried to stalk them it began to rain again and I mistakenly fired into a flock of

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15 Wandering Tattlers (got two of these, one of which was in breeding plumage). This was of considerable interest for it was the first flock of tattlers seen here by us. Also, a flock of 10 Ruddy Turnstones in breeding plumage flew over me and lit along the edge of the sand flat.

Except for the flock of plovers mentioned above, there are probably less than 10 of these birds on the island.

#1856. Pluvialis dominica ♂ testis 5 mm. Breeding plumage. Some molt.

N side airstrip. 142.4 g. Wing 160 mm. Tail like #1844.

#1857. Pluvialis dominica ♀ follicles less than 1 mm. 165.0 g.

Wing 164 mm. About $\frac{1}{2}$ breeding plumage. Heavy molt. N side airstrip.

Tail--outer 2 rectrices both essentially solid gray-brown.

#1858. Pluvialis dominica. ♀ follicles less than 1 mm. Essentially winter-type plumage except for ca. 12 black spots on belly and breast.

S side airstrip. 167.3 g. Wing 163 mm. Heavy molt. Tail like

#1857.

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We were particularly impressed by the fact that many of the plovers were lying down or standing on one leg; few were actively feeding. Could they be resting from an arduous migratory flight last night for certainly they weren't here yesterday. They proved to be quite wary and I managed to get only 2 by wing-shooting.

#1859. Pluvialis dominica. ♀ fol. 2 mm. About $\frac{1}{2}$ breeding plumage.

157.0 g. Wing 160 mm. Heavy molt. Outer rectrices both nearly solid gray-brown.

#1860. Pluvialis dominica. ♀ fol. 1 mm. About $\frac{1}{2}$ breeding plumage.

155.2 g. Heavy molt. Wing 160 mm. Outer rectrix solid gray-brown;

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next one barred with gray-brown on "dirty-white".

The fact that there were no plovers along the road or along the airstrip where they have been on all prior days leads me to believe more firmly that the flock on the sandflats was a migrating one, one which probably hadn't been here on the island more than a day.

Went out to Kuku Point in the afternoon to observe nesting Sooty Terns.

They are becoming more abundant, occupying daily more area between VORTAC and lagoon.

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DATE	SEX	WEIGHT		RATIO H/B	NOTES
		BODY	HEART		
18 April	♀ 2 fol. 4 mm.	213.4 g.	2.2 g.	1.03	Taken at Flipper Pt. (new colony with fresh eggs), kept overnight All with some fat.
	♂ testis 14	203.3	2.15	1.05	
	"	211.8	1.9	0.90	
	♀ 1 collapsed fol.	236.3	2.15	0.90	
	♀ "	195.5	1.85	0.95	
	♀ "	261.7	2.5	0.95	
	♀ "	171.3	1.8	1.05	
	♀ egg in top oviduct	229.4	2.1	0.92	
	♀ 1 col. fol.	192.3	1.75	0.91	
	♂ test. 14	214.6	1.9	0.90	
19 April	♀ 1 col. fol.	214.5	1.7	0.80	↓
	"	257.1	2.1	0.83	
	"	229.8	2.0	0.90	
	♀ fol to 5 mm.	189.5	1.65	0.90	
	"	264.1	2.45	0.93	
	♂ test 11 mm.	204.7	2.05	1.0	
	♀ fol 5 mm.	168.5	1.5	0.89	
	♂ test 13 mm.	173.8	1.4	0.80	
	♀ 1 col. fol.	180.1	1.85	1.0	
	♀ fol to 4 mm.	186.3	1.5	0.81	
21 April	♂ test 12	194.4	1.9	0.98	see note next page

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DATE	SEX	WEIGHT		RATIO H/B	NOTES
		BODY	HEART		
21 April	♂ test 10	198.1	1.7	0.86	Taken at Flipper Pt. colony at noon.
	♂ " 11	205.7	1.8	0.88	
	♀ 1 col fol.	194.4	1.75	0.90	
	♂ test 14	204.0	1.7	0.83	
	♀ fol to 4 mm.	221.5	2.15	0.97	
	"	195.5	2.0	1.02	
	♂ test 10	188.8	1.75	0.93	
	♂ " 11	192.7	1.7	0.88	
	♂ " 11	215.8	2.0	0.93	
23 April	♀ fol 4 mm.	182.5	1.8	0.99	At Peale Is. colony at noon. Many were incubating
	"	182.0	1.6	0.88	
	♀ fol 3 mm.	189.0	1.65	0.87	
	♀ 1 col. fol.	187.0	1.55	0.83	
	♂ test 10	198.7	1.95	0.98	
	♂ test 12	214.0	2.05	0.96	
	♂ test 10	198.0	2.1	1.06	
	♂ test 12	191.7	1.9	0.99	
	♀ fol 5	204.1	1.6	0.78	
	♂ test 13	200.4	1.85	0.92	
24 April	♂ test 17	213.1	2.0	0.94	" "
	♂ test 13	217.1	1.85	0.85	
	♀ egg in oviduct	216.0	1.85	0.86	
	♂ test 9	196.3	1.9	0.97	
	♂ test 12	209.0	2.05	0.98	

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DATE	SEX	WEIGHT		RATIO H/B	NOTES
		BODY	HEART		
24 April	♂ test 11	204.6	1.8	0.88	At Peale Is. colony at noon. Many were incubating
	♂ test 10	215.2	1.9	0.88	
	♂ test 12	227.7	2.3	1.01	
	♀ 1 col. fol.	185.0	1.65	0.89	
	♂ test 8	211.4	1.75	0.83	
	♂ test 14	182.1	1.8	0.99	
		N		\bar{X}	extremes
♂♂	26			0.93	0.80-1.06
♀♀	25			0.91	0.78-1.05