NOTES ON THE BIRDS OF DAIKOKUJIMA, HOKKAIDO, JAPAN

By CHESTER M. FENNELL

On June 20 and 21, 1951, while visiting the town of Akkeshi on the southeastern coast of Hokkaido, Japan, I spent a night and portions of two days on the island of Daikoku, which lies directly across the entrance of Akkeshi Bay and approximately two miles from the nearest point of the mainland. Daikokujima extends in a southwest-northeasterly direction and is approximately one and one-half miles long by one-quarter mile wide. Its coastline rises sheer from the water's surface on nearly all sides. Most of the island is roughly three hundred feet in elevation, rolling in contour, and deeply intersected by two main valleys which neatly cut the land mass into nearly equal thirds. These valleys are choked with medium-sized pines (*Pinus densiflora*), small birch trees, and other low, mixed deciduous growth. The summit slopes are covered with grass, *Artemisia vulgaris,* and *Petasites japonica.* Approximately one-tenth of the top of the island is under cultivation and provides several kinds of vegetables for the few inhabitants.

The extreme northeastern tip of Daikokujima is characterized by a low, narrow, sandy point of beach which provides the only suitable landing place for a boat and supports ten or twelve Japanese fishermen's huts.

The following observations were made during my visit.

Oceanodroma leucorhoa leucorhoa. Leach Petrel. It was impossible to estimate the total population of this species on the island during the short period of my visit, although I had no doubt that it ran into several thousand individuals. The entire top of the island, except for the cultivated areas, seemed to be riddled with its nesting burrows, and if one left the beaten trail, it was almost impossible to avoid caving into burrows at every other step. The soil in general is a dark, rich loam and is easily worked by the petrels. Apparently they prefer to burrow in among the root systems of patches of *Artemisia* and along the extreme edges of the grass-overgrown tops of the sheer cliffs. I found them particularly numerous along the banks of the trails. The burrows measured from 45.0 to 53.5 cm. in depth, sharply descending into the ground for the first eight or ten centimeters, then leveling off more gradually toward the end. In nearly all the burrows there was a sharp turn to the right or left within some 20 centimeters of the entrance. The entrances averaged 8.5 centimeters in width and 7.0 centimeters in height.

Of approximately 25 burrows examined, all but one contained single birds each on one egg. The exception contained a bird but no egg. In all cases the floor of the end of the burrow was lined with short pieces of dry weed leaves, stems, and moss. Of ten eggs collected, five were fresh, three slightly developed, and two approximately half developed.

Of a total of eight birds collected in burrows on eggs, four were males and four females. All were collected in broad daylight, at approximately 3:00 p.m. Nearly all birds uttered a mellow, squealing sound when pulled from the burrow and gently pecked the fingers holding them. Nearly all disgorged an oily, orange-yellow liquid upon being removed from the burrow. When released from the hand, they usually fluttered for a short distance and then blindly flopped to the ground among the weeds and grass. Others, when tossed into the air, flew low over the ground and disappeared down the slopes. One, upon being thrown into the air, flew low in short, rapid circles around the immediate area some five or six times and finally crashed into a clump of *Artemisia* and fell out of sight in the vegetation.

I revisited the nesting area at 9:00 p.m., just as darkness was settling, and found several birds in low flight over the ground. Several birds in the burrows, in close colonies, were uttering soft, mellow, purring calls, which ascended in pitch and terminated in a high squeal and a sharp *keck* note. This call was given repeatedly for periods of five to ten minutes or more, suddenly halting all at one time and followed by absolute silence. This particular call was inaudible at a distance of more than eight or 10 feet.

Another call heard was apparently given by single birds just within the entrances of their bur-

rows, situated some 20 or 30 feet apart. This consisted of a loud, burbling, gurgling, musical "song" given every half minute or so.

All calling and flight activity seemed to continue at a fairly high rate during the entire hour and a half I remained in the vicinity. The fall of complete darkness at 9:30 p.m. and the rise of a bright full moon fifteen minutes later seemed not to affect the degree of activity in the slightest.

Bloody remains of wings and feathers of the petrels were observed along the edges of the steep cliffs and strengthened my opinion that this species formed the main diet of the Hobby (*Falco subbuteo*), a pair of which was observed from time to time on the island. No other bird of prey was seen on the island, and although I failed to see a Hobby in the act of capturing or devouring a petrel, the evidence indicated that they did.

According to Kyogo Yamamoto, my guide and long a resident of the town of Akkeshi, the Leach Petrel arrives on Daikokujima around April 20 each year and remains until the latter part of October.

Phalacrocorax capillatus. Temminck Cormorant. Eleven birds were observed on June 19 in flight and resting on the water along the shore of Akkeshi Bay, while a group of 15 others were seen clinging to steep, excrement-whitened cliffs on a rocky headland, locally called Aikappu, at the entrance to Akkeshi Bay. A group of 25 more was observed resting on a water-surrounded rock near another rocky point known as Aininkappu, approximately one-quarter of a mile farther out toward the open sea. This group was in company with a large flock of Slaty-backed Gulls (*Larus schistasagus*) and Pelagic Cormorants (*P. pelagicus*). Two immature birds were collected. On the following day five were seen while going to Daikokujima from Akkeshi.

Upon reaching the island, I saw ten perched on the top of a high, water-surrounded rock at the extreme southwestern end of the island at the foot of the cliffs near the lighthouse. Kyogo Yamamoto expressed the belief that this rock was a nesting site, although with field glasses I was unable to see any nests or brooding birds. A long bamboo ladder placed against the rock and reaching toward the top indicated that the site had been disturbed by the egging activities of the local fishermen. Inquiries among the fishermen produced a gift of ten cormorant eggs, all of which they claimed to have collected from the top of a large rock off the southeastern side of the island. The majority of these contained nearly fully developed embryos and I was able to save only three eggs. Two of these were slightly more than half developed, while the third was in fresh condition.

From the high cliffs of the southeastern coast we were able to look directly down on a large rock approximately 200 feet off shore and through the field glasses plainly saw a total of some 25 cormorant nests all covered by brooding birds. A group of approximately fifteen birds was perched on the topmost portion of the rock. Among these some appeared to be immature birds with whitish underparts. All birds on the nests appeared to be in full adult breeding plumage, with no trace of white on the throat or breast.

At low tide on the following day, I climbed a small promontory at the base of the cliffs directly opposite the breeding rock to observe the colony more closely. The nesting rock was approximately 100 feet high and was cut off from the main island by a narrow but fairly deep channel of water. It was composed of a loose, crumbling conglomerate roughly and irregularly eroded into shelves and hollows which provided foundations for the nests. A scanty growth of green grass and small plants clung to the sides of the rock facing the shore. The topmost portion was devoid of vegetation and seemed well trodden by the resting birds. The lower half of the rock was worn away by the wave action and the top overhung the base so that the nests were inaccessible without the aid of ropes or a ladder. The nests appeared to be constructed of a brownish, straw-like material and for the most part occupied the uppermost third of the rock. The lowest nest was situated under a protecting shelf of rock approximately 50 feet above the water. All brooding birds seemed to be affected by the bright sunshine and, although the air temperature seemed cool and comfortable to me, they kept up a rapid vibration of their gular pouches. Six nests of the Slaty-backed Gull were also noted on the rock, all attended by brooding birds. One gull nest was located within three feet of a cormorant's nest. No friction or attempted robbery of nests was observed between the two species in the course of the entire period of my observation.

Upon the close approach of a small fishing boat, a total of 75 cormorants left the rock and circled out over the water in squawking protest. Nearly all the brooding birds left their nests at this time, while a group of 25 idlers remained on the top of the rock and declined to take flight. I felt that these counts fairly established the total population of the colony at about 100 birds.

After the departure of the boat, one bird was observed to pick up a stick from one of the nests, fly out over the water in a wide circle, and return to the rock where it continued to hold the stick for nearly a minute before finally allowing it to drop carelessly and aimlessly from its bill. This was probably a displacement gesture prompted by the presence of the boat, since I witnessed no other signs of nest construction during the entire visit.

Phalacrocorax pelagicus. Pelagic Cormorant. Twelve were observed on June 19 resting on a large rock near Aininkappu in company with a flock of Slaty-backed Gulls and Temminck Cormorants. On June 21 a single bird was observed swimming in the water at the base of the nesting rock of the Temminck Cormorants off the southeastern coast of Daikokujima. No sign of a nesting colony was seen nor did any of the residents of Akkeshi or Daikokujima with whom we conversed seem to have any knowledge of the species breeding in the immediate vicinity.

Falco subbuteo. Hobby. Two were observed on June 20 on Daikokujima. One was in flight along the top of the steep cliffs at the extreme southwestern end of the island, standing against the strong wind in company with a large flock of Slaty-backed Gulls. The second bird was seen late in the afternoon quietly perched on a spur of the sheer, grass-topped cliffs along the southeastern edge of the island. It remained motionless during the period of observation except for a side to side movement of the head. No sign of its breeding was noted although it may possibly nest in the vertical rock cliffs facing the sea. The huge population of Leach Petrels apparently provides the pair with a virtually unlimited source of food.

Capella hardwickii. Latham Snipe. Based upon the frequency of nuptial performances heard on the evening of June 20, I estimated the population of this species on Daikokujima to range between 75 and 100 individuals. All were observed in flight over the open grass- and weed-covered summit slopes, with the greatest concentration apparently inhabiting the more level expanses at the extreme northeastern portion of the island. This was the area most heavily populated by the Leach Petrel.

The peak of the aerial performance seemed to be attained at dusk, around 9:00 p.m., and gradually decreased in intensity as darkness closed in. Silence came with the fall of total darkness, at 9:30 p.m. Activity was renewed with the rising of a full moon some fifteen minutes later and gradually increased to the previous degree of intensity, which was maintained until I left the field of observation at 10:30 p.m.

The performance consisted of a circular flight, some 25 to 30 feet above the ground, accompanied by a rather harsh *zrack, zrack, zrack* note uttered quite regularly and interrupted only by the rapid *gă, gă, gă, gă, gă, gă, gă, gă, gă* accompanying the frequent power dives. The latter call has a rather weird, feathery quality and increases in both tempo and volume as the bird nears the ground. A halting sort of choke interrupts the series of notes some three or four syllables before the end, adding to the feeling of rush and stumbling haste. None of the performers appeared actually to alight on the ground at the end of this dive but seemed to veer off and rise into the air to continue the circling flight. From the great number of performers in the air at the same time, I think that both sexes may possibly participate in this maneuver.

A total of five birds was flushed from the ground in the late afternoon of June 20 and ten in the early morning hours of June 21. The nuptial performance was heard only twice in the daylight hours and occurred at 8:30 a.m. on the 21st. A heavy fog covered the entire island at that time and more or less produced an effect of approaching dusk.

In spite of many crossings and recrossings of the most heavily inhabited area observed the evening before, I was unable to locate a nest. Kyogo Yamamoto claimed to have found nests in that field on approximately the same date in other years, and said that brooding birds would invariably flush from the nest within a couple of feet. Since not a single bird was flushed within such close range, apparently it was still too early for the nesting season. The ovary of a female collected in the area, although somewhat enlarged, did not indicate the height of the egg-laying period. However, Col. L. R. Wolfe, in company with Hyojiro Oii, located several nests with eggs already well developed in the middle of June, 1950, in the vicinity of Uenai near Tomakomai, Iburi Province, Hokkaido, while Sgt. Gordon Burns of Kure reports having found nests with fresh eggs on the lower slopes of Mt. Fuji, at approximately 2600 feet elevation, on May 15, 17, and 19, 1951. It is my belief that the cooling effect of the water surrounding Daikokujima may retard the nesting season of this species in that area.

Larus crassirostris. Black-tailed Gull. A group of approximately 75 was observed on June 20 in company with a flock of some 65 Slaty-backed Gulls resting on the tip of the sand bar at the extreme

northeastern end of Daikokujima. Although they were also seen as stragglers in flight around the piers near the town of Akkeshi, I failed to find any others than those just mentioned and concluded that the species did not breed on Daikokujima. Kyogo Yamamoto confirmed this opinion.

Larus schistasagus. Slaty-backed Gull. I estimated the breeding population of this species on Daikokujima at approximately 500 birds, although it may have been considerably larger. The heaviest concentration of nests appeared to be on high, inaccessible shelves of eroded or grass-covered soil along the tops of the cliffs at the southwestern end of the island. The eggs are highly relished by the residents and by visiting fishermen who undertake great risks to obtain them. In several places I noticed lengths of rope secured to the top of the cliffs and precariously leading down over the side of the loose, crumbling edges of colonies of pilfered nests below. For the single breakfast that my guide and I were served by the fisherman's family with whom we spent the night, we were offered hard-boiled fresh eggs of this species. They proved delicious, the yolk being quite small in comparison to the amount of egg-white.

A single empty nest located on the top of a low, grassy spur of rock and soil along the northeastern coast of the island was constructed wholly of dry grass and weed stems and was placed in a depression in the green grass. It measured 38.0 centimeters across the top from one outside rim to the other, 23.5 centimeters across the top of the incubation bed, and 9.25 centimeters deep inside.

Large numbers of this species also nested on high, rocky cliffs along the headlands of Aikappu and Aininkappu at the entrance to Akkeshi Bay. A large transient population also frequented the waterfront area of the town of Akkeshi, seemingly attracted by the unloading of the fishing boats and the offal of the fish canning factories in the neighborhood.

Cepphus carbo. Sooty Guillemot. A total of 168 was observed resting on the water at the base of the cliffs in the immediate vicinity of Daikokujima. Eighteen of these were seen on June 20 at the southwestern end of the island and the remainder on the following day near the base of the rock on which the Temminck Cormorants nested. Of the latter group, several swam in close among the rocks and kelp along shore. Three birds were observed singly and in low flight as though they had just emerged from nesting crevices among the loose rocks at the base of the cliffs. Definite evidence of nesting was not obtained.

Twenty were observed nesting on the water at the base of Aikappu and 26 were seen in the vicinity of Bara-san, another high, rocky headland close to the town of Akkeshi. In both these latter locations, several were observed flying to and from small niches high up in the face of the sheer rock cliffs in which, I presume, nests were located. Several others were observed in pairs pursuing one another in low, rapid flight over the water as though in courtship play.

Lunda cirrhata. Tufted Puffin. Although I was unable to see a single individual of this species during my stay on Daikokujima, Kyogo Yamamoto showed me a group of approximately ten large burrows located on a small, grassy plateau at the southwestern tip of the island and said that puffins had nested there. The plateau was separated from the top of the island by a very narrow, badly eroded, crumbling ridge of reddish soil and rock and was not safely traversible without the aid of ropes.

Apus pacificus pacificus. Large White-rumped Swift. A single female with an enlarged ovary was taken while in flight over the top of Daikokujima on the afternoon of June 20. Three others were also observed in flight near the same place on the same day. Approximately 200 were constantly in flight around the steep rock cliffs of Bara-san near the town of Akkeshi and were seen to enter and emerge from narrow cracks and fissures in the rock where I supposed them to be nesting. A harsh, metallic *sweer* was voiced while in flight; a sort of musical, chattering twitter was heard from within the recesses of the cliff walls.

Alauda arvensis. Japanese Skylark. One individual was observed on June 20 in an open grassy field on top of Daikokujima.

Corvus levaillantii japonensis. Jungle Crow. Nine of these birds were observed on Daikokujima in the period of my visit. All were found on the sandy point and on rocks at the northeastern end of the island in the immediate vicinity of the fishermen's houses. On the mainland, in the vicinity of Akkeshi, this species far exceeded the Carrion Crow in numbers, but on Daikokujima I found the opposite condition prevailing.

Corvus corone orientalis. Carrion Crow. Twenty-one were observed in the period of my visit The majority were seen on the top of the island in groves of pines and mixed deciduous growth.

Luscinia calliope. Rubythroat. Of the seven individuals observed, nearly all were males in full song which frequented small, brushy, deciduous growth in the small valleys on top of the island bordering the open grass and weed slopes.

Locustella fasciolata. Gray's Grasshopper Warbler. Three were heard singing in groves of small deciduous growth on the top of the island. One in particular was heard singing constantly from 8:45 p.m. until 10:30 p.m. on June 20. The fall of total darkness at 9:30 p.m. did not seem to have any effect on the vigor and frequency of its song. A full moon rose at 9:45 and the singing was still in full force when I left the field at 10:30.

Acrocephalus bistrigiceps. Von Schrenck Reed Warbler. A total of 11 was observed in low deciduous undergrowth and/or were flushed from grass and weed fields on top of the island in the same general areas inhabited by the Leach Petrels. Several were heard in full song. This species apparently nests here although I found no proof of this.

Motacilla alba. Pied Wagtail. Observed singly on twelve occasions on the rocks and sandy strip along the coast near the water's edge. This species presumably breeds here.

Yokohama, Japan, November 10, 1951.