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PROBLEMS OF ALBATROSSES AND MEN ON MIDWAY ISLANDS

By Hubert and Mable Frings

(Pennsylvania State Univ., University Park, Pa.)

Second Installment

It is well known that the Albatrosses return from their stay over the ocean to Midway and the other islands where they breed about the end of October. Unfortunately, however, when the question arose in our plans as to just when the major part of the population arrived, not just the first birds, the existing publications were found to be vague. Naturally, if we were to study populations, it was not enough to have just a few birds. We needed at least a majority of the population. The earlier publications gave dates for first arrivals of both species, but that was about all. The next dates given were usually those for the first eggs, and the first hatchings. This interest in extremes may be understandable, but it is not too helpful.

We found it necessary, therefore, to make a study of the build-up of the populations of these birds on Sand Island, so that we could tell when the populations had stabilized. For this, we selected 20 areas around the island, representing all the habitats, and censused these completely every day. The survey showed that the birds arrived rather slowly. The first Black-foots arrived on October 15, but not until November 10 was the population apparently stabilized. The first Laysans arrived on October 27, but the majority was not in until November 21. The birds did not arrive gradually over the whole time, but came in bursts. These sudden increases may have been related to weather conditions, but so far we have not had weather data to determine whether this is true or not. As far as we could tell from observations and dissections of birds accidentally killed on roads or dying from unknown causes, both sexes of the Black-foots arrived at about the same time, while the males of the Laysans arrived a few days ahead of the females. This long period of build-up of the populations was unfortunate for us, for our schedule was such that we had to leave Midway in mid-December, and we had expected that eggs would be laid and the nesting and non-nesting birds would be occupied with their activities before December 1. As it was, egg laying was correspondingly extended in time, and the populations of nesters and non-nesters were not stabilized until about December 10. Thus time did not allow our proposed studies on the status of the non-nesters, the so-called "unemployed" birds.

The daily toll of dead birds, resulting from accidents and probably natural causes, and few hundreds dead resulting from three unauthorized kills which were perpetrated by some misguided individuals on the island were used for some biometric studies. It should be noted that the unauthorized kills were carried out at night by persons unknown, and that the officials on the island made every effort to apprehend the culprits, for there are severe penalties for such behavior. Our biometric studies included a study of the weights of the birds, measurements to develop a method for sexing these birds in which the male looks just like the female, and a study of their eggs. These will be briefly summarized.

When the birds arrived on the island, they were very fat, with extensive layers of subcutaneous fat and large deposits of fat in the body cavity. The Black-foots weighed, on the average, 7-8 pounds, and the Laysans 6-7 pounds. The stores of body fat were lost rather rapidly in females, as they produced eggs, and more slowly in males, so that, by the time the eggs were laid, the females were down by about 1 1/2 pounds and the males down less than 1/2 pound. It is well-known that the males, in these species, take the first turn on the nests, after the eggs are laid, and the results indicate the biological significance of this -- the females need to replenish their store of fat, while the males still have plenty. By the time we left, the weights, in general, were down about 1 pound from those above.

When we were on Midway in January, Mrs. Gamon, the wife of the captain in command, who had made excellent observations on the behavior of these birds, pointed out to us that she could tell the sex by the shape of the head. The males seemed to have flatter and broader heads than the females. She had determined the sex primarily by observing mating and egg-laying. With our captive birds, where behavioral observations enabled us to be reasonably sure of the sex, we found that we could also tell the sex in this way. So we decided to measure the heads of the birds, using the dead birds with which we could establish the sex absolutely by dissection, to see whether the use of head shape to sex the birds could be put on a quantitative basis. The head width, thickness from top to bottom, and length were measured. Thinking that the beaks of the sexes might also differ, the length and width from top to bottom were measured. Only the head width and beak length and width from top to bottom were measured. Only the head width and beak length were necessary to determine the sex for almost all the birds, and these were found to be easiest to do by far.

About 400 Laysan and 300 Black-foots were measured. In general, the males' heads are wider than the females', with only about 25 - 30% of the birds having overlapping measurements. The beaks of males are longer than those of females, with again only about 25 - 30% overlap. Since the level of correlation between head width and beak length in individuals is very low, the percentages cumulate, and so it is possible to sex accurately about 90% of the birds, and to sex with high probability about another 5%. Only 5% remain which would be questionable, and none of these would fall outside of the questionable range and force one to a wrong conclusion. Furthermore, the differences, once one has seen them, are such that one can learn to distinguish the sex of most birds in the field by the appearance of the head. This technique should aid in future studies on these birds, for a knowledge of sex is very important in studies on behavior and populations.

The Albatrosses that we had in captivity molted during the summer, as they apparently do in the wild, and they shed the outermost layer of the beak at this time. This left a scar or ridge at the base of the beak and near the tip. Since molting probably occurs once per year, we thought that counting these scars or ridges -- as with tree-rings -- might give us a means for telling their ages. Unfortunately, however, we had no primary source of information in this case, as with the dissections to determine sex, for there were too few Albatrosses of known ages. Thus, after some counts had been made, and the difficulties in making these counts were explored, this was discontinued for more profitable work. We mention it here in the hope that, as the number of Albatrosses which have been banded as nestlings in the last four years by the men of the Fish and Wildlife Service stationed at Midway increases, these birds will be examined to see whether this method holds promise.

Our son, Carl, took on the project of measuring and weighing the eggs of these birds. It is quite simple to substitute an egg under a bird while its own egg is being measured and weighed and later to return the egg to its owner, for, once on a nest, these birds are remarkably docile. He studied 160 eggs of Black-foots and 20 of Laysans. In general, there are no differences in size and coloration between eggs of the two species. There are some variations in shape, but, on the average, the eggs are about 4 1/2 inches (115 mm.) long and 3 inches (75 mm.) in diameter at the thickest part.

They weigh about 10 1/2 ounces (290 g.) and have a volume of 10 fluid ounces (280 cc.). The color ranges from almost pure cream through numerous brown-spotted patterns to almost all brown. Generally the large end of the egg has brown spotting, which is usually fairly dense. Through dissections of females killed in various stages of egg production, we were able to establish that the brown pigment on the eggs is dried and altered blood. This comes from small hemorrhages in the oviduct caused by passage of the large egg. When first laid, the spots are obviously red, only on drying and ageing do they become brown.

Frank Little, our graduate assistant, took on the study of flight patterns of these birds. These have importance in the problem, because some people believe (Kenyon et al., U.S. Fish & Wildlife Spec. Sci. Report - Wildlife No. 38, 1958) that the birds soar over the runways as part of their pattern of soaring flight along the edges of the tree-covered dunes. This has resulted in the tests in which the trees and dunes of the area south of the airstrips are being removed. His observations indicate that the birds fly over the runways, where updrafts just do not exist, and that the patterns of flight are regular and more or less cyclic. While the birds use updrafts along dunes and tree groups for soaring, they seem to persist in flying in patterns that take them over the runways even when these vertical features of the terrain are removed. At any rate, there was no evidence that the birds merely wheeled over the runways in reversing their flight paths, as claimed. Those that were over the runways were almost invariably crossing them to get to the other side, and they were flying, not soaring. There is no question but that the birds use the visual landmarks afforded by tree lines and water edges, just as Gulls and other sea-birds do, in scouting for food, and that they fly more on windy than on still days (which may be because it is far easier to take off and land, and because flying into the wind, as they do, reduces their ground speed and thus allows them to follow landmarks). The relationship of this to removal of the trees and dunes, however, seems problematical. Denudation of the land and levelling of the dunes might so reduce the possible nesting sites that the populations of the birds drop, but this is quite another matter.

To be continued

PRESENT STATUS OF THE AVIFAUNA OF THE HAWAIIAN ISLANDS
- AN APPRAISAL -

By Richard E. Warner

(Wildlife Biologist, Dept. of Agriculture
& Forestry, for the Island of Kauai)

The Hawaiian birds may be divided into five general groups; the endemic land birds, the indigenous pelagic birds, the game birds, the introduced passerine birds, and lastly the migrants and stray visitants. This paper will be devoted primarily to a consideration of the first two groups, the endemic land birds and the pelagic sea birds. It is believed that these, more than for example the introduced passerines, should be carefully watched and their conservation zealously pursued, as they form unique and fascinating faunal groups which are peculiar to the Hawaiian Islands.

A brief history of the two groups, a thumbnail sketch of their present state of affairs, and an attempt at offering a tentative prognosis will be presented. No attempt will be made to cover all the species within the groups; rather, generalizations based on a few specific examples will be attempted.

The Hawaiian Islands, which include a chain of islands, rocks, atolls, and shoals, sprawl across the Pacific Ocean in a north-westerly direction for approximately 1600 miles. This great chain lies between the north latitudes of 18 degrees 5 minutes (about Mexico City) to 28 degrees 25 minutes (approximately San Antonio, Texas). Development geologically started at the north-west end, progressing south-easterly; the net result is a series of islands of varying ages, from Kure, a low coral island

with no exposed basal rock to Hawaii which is still in the process of formation.

The presence of a series of islands, rather than a single large land mass, is believed to have had a highly significant influence on the rate and amount of evolution that has occurred in the fauna which over a period of time has colonized the island chain. The spectacular adaptive radiation which the native birds have undergone, currently believed to be the result of unfilled or vacant habitats interacting with geographic isolation, has resulted in an extraordinary array of related species of forest birds which are endemic to the islands. One family of the native birds, the Drepaniidae, presents the case for insular evolution in a classic manner, and for this reason alone is of immense importance. What has happened to the group of native land birds, particularly after the advent of white man in the latter part of the 18th century?

Before the coming of man, either polynesian or caucasian, the forests of the Hawaiian Islands extended from the tops of the mountains to the ocean's shores. These forests were in themselves extraordinary things, having followed somewhat the same course of evolution as the native birds. The early polynesians brought with them only the pig, the polynesian rat, and the jungle fowl, which did little to disrupt the biology of the area. They also brought the practice of burning and clearing of patches of forest for cultivation, and a portion of the forests particularly along the coasts of the islands had been removed when the first white men appeared.

However, it was as usual the advent of the white man which precipitated the ensuing degradation of both the endemic flora and fauna. Cattle, sheep, horses and goats were introduced and allowed to multiply unreasonably. Many exotic species of plants became established, in many cases replacing the native flora entirely. And perhaps more devastating to the highly specialized native birds, insect parasites and diseases were brought in by the score. The inevitable result was a profound alteration in the structure of the biota; food supplies upon which the highly specialized species were dependent became scarce or vanished entirely.

Suffice it to say that the changes were stupendous, and that for the next one hundred years the fauna underwent a drastic readjustment; unfortunately for many species, particularly the highly specialized and rarer forms, extinction came before adjustment to the changes.

By the early 1900s the situation had stabilized somewhat. Laws were passed protecting native species and prohibiting importation of many plants and animals; livestock was for the most part removed from the forest areas, and perhaps of greater significance the forests lost their economic importance. Not containing substantial quantities of merchantable timber, and with forestry research at a low ebb in the Territory, the uplands had a chance to, in effect, regain their composure. Those species of birds which had not passed into oblivion adapted themselves in varying degrees to the new environment. Apparently a degree of immunity to a number of avian diseases, some of which are as yet unidentified, developed in the wild populations. The situation improved further as native species of trees and shrubs became reestablished with the removal of grazing and browsing pressures.

Today the picture is again changing; there is active a rather complex interplay of economic, scientific, and aesthetic forces, all of which are having a role in the destiny of the native birds. The long term effect of these forces is difficult to foresee, but if one makes certain assumptions a prediction may be perhaps worth attempting.

Essentially our prediction equation would include the following items; 1. The prospect of large scale silviculture, never before seriously explored in the Territory, is now an imminent reality. A greatly accelerated program of analysis of forest productivity potential, under the auspices of a federal forestry research group, is

in progress. Administrators and politicians are excited and optimistic over the prospects of a new industry in Hawaii.

2. The predominant philosophy of land use, no different in the Territory than elsewhere, and aggravated by the very limited total land area available for any use, is to derive the greatest possible economic benefits. It is believed that this philosophy automatically precludes any compromise to the accepted and in this case potentially devastating practices of commercial timber production as regards the native birds.

3. The stigma against use of native forests for cattle grazing, which developed to a high pitch around 1900 when so many of the forests were being utterly destroyed, accelerated erosion was common, and significantly when the great and definitive faunal surveys of the Territory were first appearing in print, has now subsided. The restraints of social criticism have been relaxed; ornithology in Hawaii is at a low ebb. Only occasionally does a researcher or naturalist scrutinize the native bird populations, and then the publication rarely if ever reaches local attention. As a result private economic interests are again nibbling away at the remaining forest reserves. Within a decade we will probably witness the demise of the single remaining remnant of dryland forest, and with it the shred of native fauna that still clings to the area. The Hawaiian crow may be a case in point; but only time or a soon-conducted ecological study will tell.

4. The last factor, which perhaps has greater potential significance, is the increasing awareness within the society of the meaning and value of conservation as a working concept. Presently, however, the maturity of understanding necessary in the society to demand the preservation of anything biological is lacking.

Before equating the above, it seems wise to briefly examine the status of the second major group of birds. The indigenous pelagic species, which include the albatrosses, boobies, terns, tropic birds, and so forth, have because of their isolation from human influences, in general suffered less from the devastating vagaries of man. Those species, such as the dark-rumped petrel which nested on the slopes of several of the major islands, the terns and shearwaters which had the misfortune of choosing nesting islands too near human habitation, and recently the entire bird faunas of Laysan and Midway Islands, have not fared so well.

With the exception of Midway and Laysan, practically all nesting areas of the sea birds have since 1900 enjoyed relatively complete protection from disturbance or exploitation. Various laws were passed which prohibited entry to the offshore islets, protective regulations were instituted for those species nesting on inhabited islands, and in several instances the bird populations have increased notably in response to the improved protection they are receiving. And again, perhaps the most important single fortuitous circumstance was present; that of negligible economic value of both the birds and their nesting sites.

In contrast to the above can be cited two notable exceptions. The history of Laysan Island is well known; in the late 1800s commercial quantities of guano were discovered on the island and mining operations ensued. The operations themselves were not of any permanent consequence to the bird populations, but the indiscretions of the few inhabitants during the exploitation wrought havoc to both the flora and fauna. Members of the company living on the island during the guano mining operations introduced a series of animals, including pigs, goats, guinea pigs, and finally rabbits. Of all the species introduced, only the rabbit was highly successful, and it became so numerous that it ultimately completely devegetated the island. The 1923 expedition to the island reported the once-luxuriously verdant island to be a barren desert; the few remaining rabbits starving to death. When finally the last of the rabbits were removed the area was a lifeless waste; three of the five endemic land birds were extinct. A strange and fascinating flora was completely wiped out.

Since that time the island has experienced only minor disturbances, and that remnant of the flora which had managed to survive the forementioned experience is gradually reestablishing itself. The area will never, under any circumstances, be the same as

before the members of the company arrived, but the indications are that, if left alone, a certain balance will ultimately be restored.

The Midway Islands demonstrate a number of the factors discussed, and an additional one; the military. The Midway Islands, comprising two small adjacent islands are, similar to Laysan, low-lying coral islands, presumably the remnants of pre-existing high islands which have since eroded away and perhaps experienced gradual submergence as per Darwin's theory of atoll formation. Until the early 1900s they remained relatively obscure, and except for sporadic shipwrecks, who's crews on occasion ate prodigious quantities of nesting birds, suffered little from the hand of man.

In the early 1900s a cable station was established on Sand Island, the larger of the two, and with one notable exception with only minor effects. The Laysan rail, by now extinct on its homeland, had been successfully introduced to Midway, and the murid rats which were carried ashore quickly became established, preying among other things upon the rail. The unaccustomed predation pressure quickly carried the little bird to complete and final oblivion.

During world war 2 the Navy, which had by now a base on Sand Island, greatly expanded it's facilities on both Eastern and Sand Islands. Runways were built and extended; new housing was constructed, all of which necessitated preemption of nesting areas. Recently the DEW line was extended across the Pacific using radar picket planes based at Midway. The resultant competition for airspace over the runways has persuaded the Navy that the albatrosses and terns, the main offenders, must go. To date no one has persuaded the Navy otherwise, and experimental wholesale killing of nesting birds is underway.

Most recently it was concluded to install an ultra-high-frequency transmitting station on Eastern Island. Proper function of the unit demanded an absolutely flat substrate, with no hillocks, bushes, or trees in the antennae area. Consequently, even as this paper is **being** read, tens of thousands of nesting sea birds are being bulldozed into the surf, and the entire surface of the island is being paved. There has not been, and there is not expected to be, an official complaint lodged or question raised by any conservation agency.

It can be seen then, that Hawaii's problems are in some respects identical with those of other areas. Aggravated by the small size of any individual habitat, extinction becomes a more dominant feature in the history of species. It is seriously doubted that our last factor, conservation awareness within the society, will have a major influence on the destiny of the bird populations within the next decade. Quite probably the picture will remain one of small gains stimulated by vehement agitation of conservation groups on individual issues that have emotional appeal, but with a gradual overall deterioration of the bird fauna.

FIELD NOTES:

Field Notes - Kauai

When my sister and I left for a five days' vacation on Kauai, we had not given bird watching a thought for some reason or other, but almost at once upon our arrival at Kauai Inn we were made very much aware of the sweet songsters.

One exuberant singer woke us early each morning with such delightful calls, whistles, snatches of song that we immediately realized that here was a stranger we had never encountered before and became most anxious to see and identify this newcomer. Fortunately two tourists obliged by asserting most emphatically that this was none other than a mockingbird. We took their word for it and were easily convinced, for

this versatile songster imitated the calls (albeit very much more melodiously) of the mynahs, thrushes, cardinals, etc. in the neighborhood of the hotel.

At one time we were almost sure we saw this elusive stranger when a long-tailed bird flew into the towering African tulip tree which stands close to heavy underbrush in back of the hotel cottages. We also saw considerable activity among the branches and baby-talk of a bird we were not familiar with. So, no doubt, here was a mocking-bird family close by the hotel.

During an early evening's stroll along the main street of Lihue, we saw a small owl alight on top of a garage, and we immediately wondered whether or not it could have been one of the recently imported ones. The large, familiar short eared owls were seen on every trip to any point of the island. At Mahelona Hospital we watched one hover at one, then various other points very close to the nurses' quarter. Miss Hensley told us that in all the years of watching these owls in that neighborhood, she has never actually witnessed a strike.

At Mahelona Hospital we also a meadow lark take to the air.

At Poipu beach, where we had previously viewed the interesting Moir gardens, we saw a Chinese thrush fly into the dry shrubbery which immediately swallowed it up, the color of the brush being identical to that of the bird. It was perfect camouflage.

Where else but at Kilauea Lighthouse was it possible for us to watch at very close quarters, the lovely white-tailed tropic birds perform their rhythmic dance-like flight back and forth, back and forth along the sheer cliff, where their nest must have been? What a lovely spot this is! The entire shoreline discloses mysterious, secluded coves, their horseshoe-shaped beaches completely enclosed by steep cliffs washed by the blue sea! A few of the smaller black storm birds circled the lighthouse, drifted away on the aircurrents, and suddenly sheared off, like planes on maneuver, than flying swiftly beyond our range far out to sea.

At breathtakingly beautiful Kalalau we were fortunate enough to see several apapane alight on Ohia Lehua trees that were in full bloom. The spy glass brought them near and so we were able to see their beautiful color and markings. Against the Napali cliffs the white-tailed tropic birds floated as though suspended by silken threads. We followed a thrush by the Lookout a little ways into the woods as it flitted further and further away from us. The Ohia Lehua trees at the Danford home and elsewhere at Kokee were alive with Anianiau.

So this was truly a richly rewarding trip so far as seeing and hearing the more unusual birds was concerned. How much these dear songsters add to one's enjoyment of not only vacation spots, but to our daily lives in our gardens where they favor us with their presence.

Mary Roberts

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Newell's Shearwater, or Ao

A Newell's Shearwater was found in an open area at the Honolulu airport about 1:00 a.m. on August 7th, evidently blown in by hurricane Dot. The bird was taken to the zoo, where it was examined, weighed and measured (14" long, wing span $31\frac{1}{2}$ ", 293 gr., or about 10 $\frac{1}{3}$ oz.) and banded with T.H. Fish and Game band C-1700. The bird appeared in good flesh and condition, and was released that same afternoon by Paul Breese from Kailua beach. It flew out to sea close to Popoia Island.

The Newell's Shearwater formerly was feared to be extinct. Walter Donaghho in his journal of the 1938 Line Islands expedition wrote that "several were spotted" about

150 miles out from Honolulu. (Elepaio 13:4, 22). In 1954 one flew into the sugar mill at Aiea and was later identified by Dr. Frank Richardson and George C. Munro. In October, 1956, another Newell's was found on a beach near Kapaa, Kauai among a number of Wedge-tailed Shearwaters, all in dying condition. (Elepaio 17:6, 44). It is evident that the Newell's is still breeding on Kauai, and perhaps less rare than they have been thought to be.

Grenville Hatch

Plover are here.

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From Bob Carpenter, Haleakala:

While I think of it I thought I'd let you know the first plover seen this season was on August 5th just outside the park boundary near the road to Kahului. I have seen it or another one in the same area twice since then. This morning (August 13) I saw one right near park headquarters. Maybe these never left for their breeding grounds, but these are the first we've seen since May 20. Has anyone else seen any this summer?

From Priscilla Harpham:

Thursday, August 13, while on a walk along the Kahuku coast, adjacent to the golf course, no birds were sighted. Two days later, the morning of Saturday, August 15, several large flocks of plover, still in their summer plumage, were seen. They appeared very thin and allowed us to come within ten feet of them while they were busily eating.

From Ruth Rockafellow:

Ruth reported seeing her first plover at Tripler Hospital on August 13, and the first wandering tattler at Duke Kahanamoku Beach on August 16. He was so busy eating he paid no attention to the people on the beach.

CATTLE EGRETS

Cattle egrets have been released upon all the main islands except Lanai, through joint action of the ranchers, who have financed their purchase, the Territorial Board of Agriculture and Forestry, and Paul Breese of the Honolulu Zoo. The egrets are spreading in the eastern part of the United States, after appearing spontaneously in Florida. On the mainland they remain with the cattle, feeding upon the flies which infest the latter. Although some of us regard importations with some trepidation, it would seem that the cattle egret will not displace any of our native birds. All egrets have been examined, and blood tests made before release, to insure that they are free from disease.

GRENVILLE HATCH

Throughout all the years since our Society began we have had the quiet, friendly presence of Grenville Hatch among us. She is loaded, saturated with bird wisdom, as well as wisdom in how to live. And now, disaster is upon us. Grenville chooses to go travelling. It will take a great deal of skill and work to find out how to do without her, and survive. What will life be like when questions cannot be answered by "calling up Grenville"?

But we'll have to survive as well as we can. And one thing we can look forward to is hearing from our old friend now and then. For Grenville could not possibly travel and not be conscious of birds. Most of them will be new to her, and we can imagine and envy her delight in seeing them. We shall hear too of old friends she meets whom we have in common, perhaps something of her new friends.

We'll have to forget our own plight, and wish her the finest journey she can possibly plan. Knowing her as we do we know it will be a delightful journey, her experiences touched with humor and understanding. And in due time we shall look forward to her being with us again.

Happy journey, Grenville, the wish of all.

Margaret Titcomb

THE ELEPAIO

The editorship of THE ELEPAIO will be taken over temporarily by Margaret Newman.

NEW MEMBERS:

We welcome the following new member to our Society:

John Bowles, 5002 Naunalani Circle, Honolulu 16, Hawaii

SEPTEMBER ACTIVITIES:

FIELD TRIPS:

September 13 - A mountain trail trip, led by Mace Norton

September 27 - Shore bird trip, led by Ruth Rockafellow.

Meet at the Library of Hawaii at 7:00 a.m. for each trip.

MEETING:

September 21 - At the Honolulu Aquarium auditorium at 7:30 p.m. Mr. Richard E. Warner will talk on "Laysan Island Today", illustrating his talk with slides.

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