

Horned Larks were more abundant than other species along the roads, which accounts for the number of tests made with them. It is assumed that they were all *Otocoris a. actia*, as specimens collected belong to that form. Their speed of flight, as shown in the table, varied from 22 to 28 miles per hour. In some instances observations were made on two or three birds at the same time or, on two occasions, on small flocks. In one test a Horned Lark travelling parallel to the car was easily outdistanced with a speed of 30 miles per hour.

Two Great Blue Herons observed separately travelled at exactly the same speed. The rate of flight of a Western Redtail was found to be 22 miles per hour. One Sparrow Hawk that flew parallel with us for nearly a quarter of a mile also maintained an even rate of 22 miles.

In these observations the birds that were timed were all near at hand. The two Great Blue Herons were about seventy yards away, the individuals of the other species much nearer. As the distance of the bird from the car increased there was an increase in liability to error, but in the case of these two herons, which were gauged separately, the speed registered the same, and all of the readings may be considered fairly accurate. With the Horned Larks the observations were made often at a distance of only 30 or 40 feet. With all of these birds only those pursuing a direct flight were recorded. When the course was erratic (from side to side) the birds were disregarded.

In examining the results a surprising agreement is found in the rate of flight of birds entirely unrelated, and in species varying greatly in size. There is no doubt that if frightened any of those observed might have made a more rapid course, but I believe that the figures show approximately normal flight in all. That these speeds fall far below those attributed to birds in general will, I think, be appreciated at a glance.

*Washington, D. C., March 31, 1916.*

## A VISIT TO HAT AND EGG ISLANDS, GREAT SALT LAKE

By R. H. PALMER

WITH FIVE PHOTOS BY A. O. TREGANZA

ON THE 14th day of May, 1915, four members of the Salt Lake branch of the Cooper Club began a trip planned for the purpose of visiting the two principal bird rookeries located on the islands of Great Salt Lake.

The party left Salt Air at 4 P. M. and encountered a calm for several hours in which very little progress was made. Time, however, did not rest heavily on the party. The cool afternoon followed by a gorgeous sunset, the flight of an occasional bird, the ever present snow-covered hills, and the gentle, restful rocking of the boat, tuned with the pulse of the waters, were all conducive to bringing forward to the present memories of past experiences as well as comments appreciative of our most charming and care dispelling surroundings. The hours until sunset came and went, and finally the sun slowly passed down behind the western hills and the time of shadows and haze followed, adding mystery to the strange outlines of earth and sky and water, while the friendly little wavelets snuggled warmly up to the sides of

our goodly craft. The spirit of pervading quiet settled down over the face of the brooding waters.

However, shortly before midnight, a stiff wind came out of the northwest freshening up the waves and adding tone to the erstwhile quiet aspect of the night. This soon increased to a gale accompanied by a heavy sea. On all sides the threatening wind beat into a driving spray the curly white crests of the salty waves. Our course was to the northwest in the face of the wind. No headway could be made by tacking, owing to the strong adverse wind and the heavy sea, which not only drove the boat leeward but also dashed over the boat, saturating everybody and everything except the provisions that were safely stored away under the hatches. The anchor was dropped at about 3 A. M. in some sixty feet of water and at a distance of a mile or so west of the south end of Antelope Island, and the boat was bailed out preparatory to snatching a little sleep.

Towards morning the wind quieted down and the party arose and made a few feeble and sluggish attempts towards the prevention of getting any colder. The prevailing opinion at first was that we had frozen during the night, but this illusion proved to be produced by the stiffness of our clothing, due to its being impregnated with salt from the previous night's saturation. As there were few or no facilities for exercise, the situation resolved itself into each of us telescoping as far as possible into his clothes, mudturtle-wise, and awaiting the rising sun. How welcome were the pink tints reflected from the western peaks can be imagined only by those who were members of the party. The sun finally came over Antelope Island very slowly, and with it a slight breeze so that we were able to make our way to this island.

A brief examination was made of the vicinity of our temporary camp but nothing of any ornithological interest was found. After a stay of perhaps two hours, we embarked at about 10 A. M. for Hat Island, some thirty-eight miles away. We encountered a slight northerly breeze so our progress was slow. A few solitary gulls, several small flocks of from four to twelve Eared Grebes feeding on the floating refuse of the lake, an occasional Great Blue Heron, and several flocks of the White Pelican were seen. Now and then the peep of a hummingbird, presumably the Black-chinned, was heard in the air above. We also saw two cormorants in the distance flying close to the water, according to their custom. At about three o'clock in the afternoon a stiff northeast wind sprang up, and we made very good time toward Hat Island. When in the current from Bear River, some ten miles from the island, we saw a large number of gulls feeding in the water, presumably upon the food material brought in from Bear River. Towards evening many isolated gulls overtook us while they were returning from foraging expeditions to the mainland.

The nearer the island the more numerous and vociferous did the bird life become. At 7:35 the sun sank into the red and golden west and in about half an hour we passed into the quiet lee of Hat Island. Here we were greeted by the nasal squawks and aerial courtesies of literally thousands of gulls that arose from the island and wheeled around over our boat. Words are inadequate to convey any impression or to give a concept of the vastness of their numbers. They seemed to literally jostle one another in the air as they clouded the sky with their mass. They were suggestive of a huge swarm of bees or the clouds of Passenger Pigeons that Audubon describes. When in

the near vicinity of the island, a very marked musk-like odor was observed. This came from the deposits of guano on the rookery.

A landing was made and a temporary camp pitched on the sandy beach. Great care had to be exercised in selecting a camp site to avoid destroying the numerous nests of the gulls. After a hasty supper we examined a few of the nests in the near vicinity, and then repaired to our sandy couches to impatiently await the coming of Sunday morning. All through the night were heard the various calls of the gulls, the occasional hoarse croak of the Caspian Tern, now and then the dissatisfied grunt of the Heron. This latter bears a close resemblance to the first part of the very unmusical call of the American Bittern.

The early matins of the gulls forbade sleep after the first appearance of dawn, so we all arose early and made a rapid excursion over the nearby beach. Near the camp were found sixteen nests of Caspian Terns that had chosen this location for their colony. To this reference will be made later. After a hur-

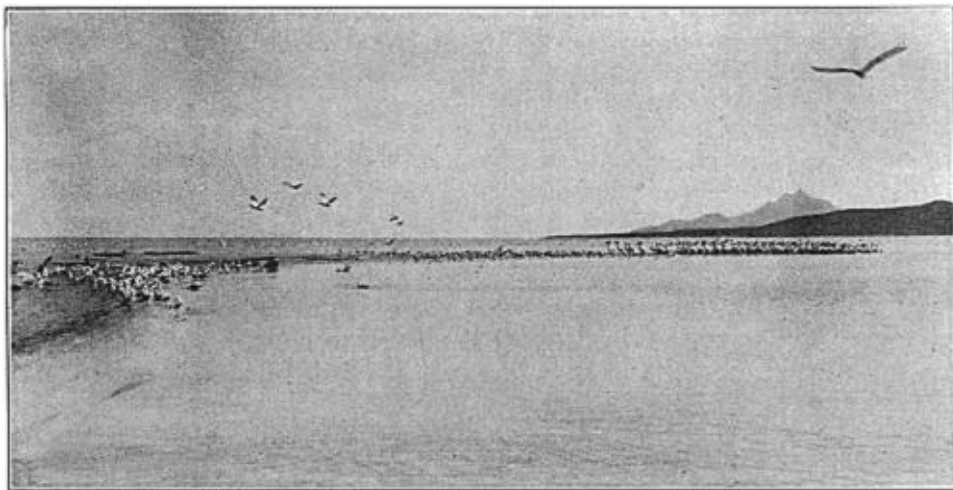


Fig. 35. SAND SPIT, WITH RESTING FLOCKS OF PELICANS AND GULLS. CARRINGTON AND STANSBURY ISLANDS IN THE DISTANCE; LAKE BONNEVILLE LEVELS SHOWN ON THE FORMER.

ried breakfast a somewhat detailed examination of the island was made. Hat Island is located about thirty-five miles almost due northwest of Salt Air. It probably derived its name from its partial resemblance to a broad-rimmed straw hat that had lost its band and hence had suffered vertical telescoping. It is roughly circular in form, about thirty rods in diameter. On three sides the beaches gracefully flank the central eminence that rises to a height of some seventy-five feet. On the southeast side the beach is much the widest; also from that side a spit extends (shown in figure 35) out into the lake for about ten rods. This spit extends for perhaps a mile farther under the water. It was formed and is being extended by the prevailing northwest winds that cause the waves to beat against the northwest side of the island, where they have eroded away the rocks, carried the resulting sand around each side of the island, and deposited it on the lee side. At first two short spits were formed on either side. As the work of the waves progressed the two spits grew in

length, and finally joined in two graceful curves, leaving a small pool in the V-shaped depression between them. The sand along the beach and spit is almost entirely oölitic in structure and hence lends itself exceptionally well to the rolling action of the waves. The crown part of Hat Island is composed of a hard, almost black, conglomerate.

There was little vegetation to be found on the island and this composed of very few species. The only plants observed were one species of allium or wild leek, one cruciferous species resembling the shepherd's purse, one species of the borage family, one chenopodium, one species of cactus, alfileria, and one of the greasewoods. The last was somewhat plentiful while the others were merely sporadic.

The fauna on this island was likewise extremely limited in number of species. In addition to a few insects, we found only one species of lizard and six species of birds. The latter, in the order of their relative



Fig. 36. CALIFORNIA AND RING-BILLED GULLS ON HAT ISLAND. THERE ARE 754 BIRDS INCLUDED IN THE PICTURE.

abundance, were: the California Gull (*Larus californicus*), the Ring-billed Gull (*Larus delawarensis*), the White Pelican (*Pelecanus erythrorhynchos*), the Great Blue Heron (*Ardea herodias treganzai*), the Caspian Tern (*Sterna caspia*), and Killdeer (*Oxyechus vociferus*). Of the last we saw but one individual, and that was probably there as a mere visitor. The other five species were all found nesting on the island.

It is impossible to give an accurate estimate of the bird population of the rookery on Hat Island, hence the following is intended to be merely approximately correct. It is possibly correct within a ten per cent error. The California and the Ring-billed gulls comprised a majority of the population. It is impossible to state with any degree of definiteness which of these two was the most numerous. However, from the examination of a large number of individuals, it seemed that the California Gull was in the majority. An idea of the gull contingent will be had from figure 36. This picture was taken on the

southwest side of the island, where the birds were the most abundant and the view less obstructed by rocks and vegetation. By actual count of the birds in figure 36, there were found to be 391 on the wing above the sky line and 330 below. Allowing a ten percent increase in the latter to account for the birds that are concealed behind the rocks and vegetation, there would be a total of 754 birds that were within the field of the camera. Taking as a very conservative estimate that this picture would include one-tenth of all the gulls that inhabit this island, we get 7540, or practically eight thousand as an estimate of the gull population. Other estimates, however, range from 15,000 to 20,000.

There were, perhaps, two thousand White Pelicans, some four hundred Great Blue Herons, and about fifty Caspian Terns. Thus summarizing, we would get the following as an approximate estimation of the bird population of Hat Island. Considering the small size of the island, it will be seen that its population is relatively dense.

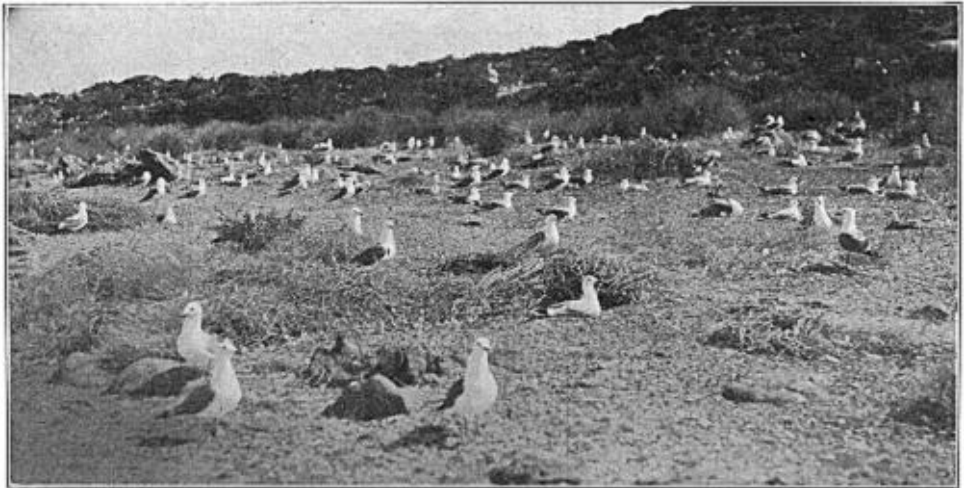


Fig. 37. NESTING GULLS. PRACTICALLY ALL THE BIRDS ARE FACING THE SUN.

California and Ring-billed Gulls.....	8,000
White Pelicans .....	2,000
Great Blue Herons .....	400
Caspian Terns .....	50
<b>Total .....</b>	<b>10,450</b>

CASPIAN TERN.—There were very few of the beautiful Caspian Terns; twenty-five pairs would probably include all that our party saw on the island. There was a small colony of about twenty that nested on the beach near the point where we had inadvertently pitched our camp. Some of the eggs examined in the colony were fresh, and others partly incubated. All the nests were located in a space not more than twenty feet square. The nests were built each in a small hollow about two inches deep by six inches in diameter, and were crudely lined with short sticks. The eggs in all cases were two in number. The outline of the egg showed a very pointed oval. They normally have a pale blue background and are mottled with a brownish pigment. The mottles or blotches are larger and more vivid on the large end of the egg.

It was in this colony that the piratical tendency of the gull was first observed. Owing to the proximity of our camp to the colony, the terns, which are shy birds, abandoned their nests. The gulls, which have little or no fear of man, and no compunction about egg stealing (of this we found ample evidence), raided this colony and destroyed a number of the eggs. The remainder were taken by our party as specimens, as it was evident that they would otherwise be destroyed.

CALIFORNIA AND RING-BILLED GULLS.—The nests of these birds were found in all parts of the island though they were the most plentiful on the beaches of the south and west sides. An idea of their abundance may be gained from figure 37, which was taken on the south beach. It is of interest to note that all the nesting birds are facing in one direction, the east. Nests were found on all parts of the island, from the beach within a few feet of the water to the top-most ledge in the crown of the Hat; from the sandy beach to the nooks and crannies of the rocks, and under the greasewoods; two were even found in abandoned nests of the Great Blue Heron. They were in the parts of the island appropriated exclusively by themselves, and among the nesting colonies of the White Pelicans and Great Blue Herons. For a description of the gulls' nests reference may be made to the description of the nest of the Caspian Tern, with the addition that those of the gulls were generally scantily lined with a few feathers and squirrel-tail grass.

Very great diversity was seen in the individual eggs of different clutches. Some clutches were very light and sparsely mottled, others were almost entirely of a sooty brown color, the blotches covering the egg almost completely. A few had well defined streaks like the oriole's or red-winged blackbird's. One of the clutches was entirely different from the usual type in being blue in color and almost entirely unmarked. This can probably be explained by assuming some abnormal condition of the gland or duct that secretes the pigment, thus preventing the flow of the brown coloring matter with which the eggs are normally blotched. The eggs were a very pointed oval in outline and uniform in size.

The clutches were practically completed at the time of our visit (May 16) and usually contained three eggs. Occasionally two and rarely four were found. Only in exceptional cases were young gulls found and these were but a day or so old. Figure 38 shows one of these cases. The protective coloration of the young is here well shown by the likeness of the small elongated dots and background to the lights and shadows under vegetation. A query, however, might be interposed, for the light and shadow scheme is reversed in the bird, that is, the background on the gull is light while with the surroundings it is dark.

An interesting condition was noted among the gulls that might be called involuntary parasitism. Several clutches were found with one egg that varied greatly in its markings from the other two. At first this was accounted for by assuming that the parent bird deposited an egg that simply varied in its markings from the other two. Finally, however, there seemed to be so many of these cases that another explanation was sought, and what we believed to be the key to the true explanation was found in the presence of another clutch near by, *with the identical markings of the odd egg in the first clutch*. We concluded, therefore, that the second gull had mistaken her neighbor's nest

for her own and, acting on this impression, had deposited an egg therein. Quite a large number of instances of this kind came under our observation.

We observed several interesting attempts on the part of gulls to conceal their nests and eggs while they were absent. This was accomplished by covering them with a few feathers and grasses. In addition to the hiding aspect, there might also be in this scheme an idea of protection from changes of temperature. As is well known, this device is resorted to by nesting geese and several of the ducks.

The homing instinct of the gull was evidenced by a rather remarkable and appealing instance. A dead gull was found on a nest. An examination of the bird revealed that she had received a gunshot wound in the large pectoral muscles of the breast, the blood from which had stained her white breast

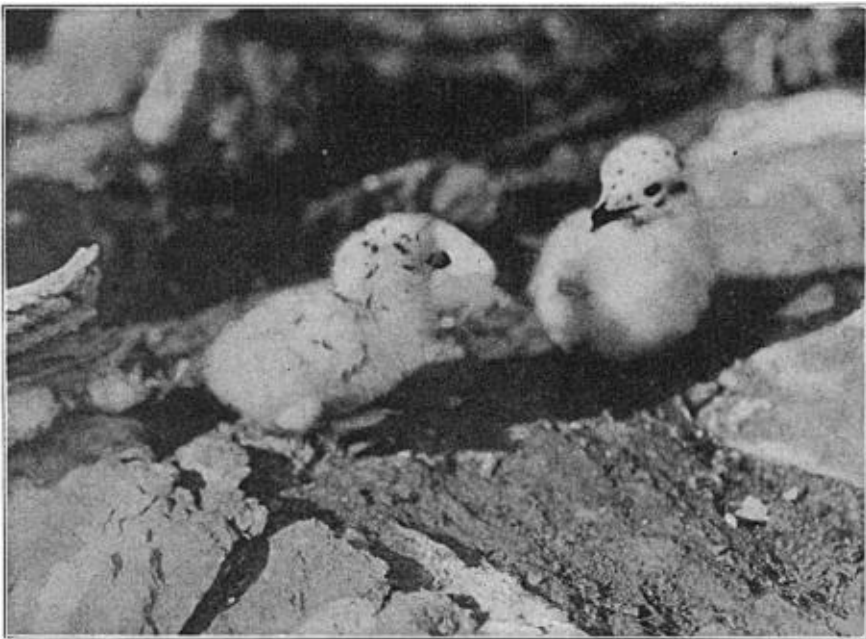


FIG. 38. YOUNG GULLS. THE DISRUPTIVE NATURE OF THEIR MARKINGS CARRIES OUT THE SCHEME OF LIGHTS AND SHADOWS SHOWN IN THEIR IMMEDIATE SURROUNDINGS.

feathers and the eggs that she had flown thirty miles to reach. I would that the thoughtless marksman that fired the fatal bullet could sense the stab that every beat of her pinions gave as she performed this journey, her last act of maternal devotion.

**WHITE PELICAN.**—A large number of pelican nests were found on the east and south sides of the Island. All these were at some distance from the shore, and among the low greasewoods. The nests bore the appearance of being simply a mass of pebbles and sand that had been scooped together in a mound about twenty-four inches in diameter and four inches high. There was a shallow depression in the top of the mound which was lined with short twigs. In this the eggs were deposited. Several pelican eggs were found scattered here and there on the ground. As all of these that were examined were fresh

the possible explanation is that they were laid before the nest was built, or possibly while the eggs that had previously been deposited in the nest were being incubated. The eggs of the pelican are white and have a very rough texture. They differ from the eggs of the terns and gulls in being elliptical in shape.

The nesting season of the pelican apparently extends over a period of five or six weeks at least. It probably begins some two weeks before those of the gulls and Caspian Terns. This was indicated by the presence of young pelicans some two weeks old, and eggs in all stages of incubation, as well as unfinished nest mounds. The feeding habits of the young pelicans was a matter of considerable interest. It had always been the opinion of the writer that the young were fed from the pouch of the parent bird. However, upon observation, this was shown to be at variance from the facts. The parent bird opens its mouth and the young one thrusts its head down into the throat, while the old bird contorts itself, presumably in the efforts to aid in the regurgitation of the partly digested food. It is possible, however, that when the young become more mature and there is no longer a need for predigested food, they feed directly from the food carried in the pouch.

The young birds are hatched entirely naked, and it is only when they are a week or ten days old that they acquire a scant covering of down. The gregarious habits of the pelican are well demonstrated in the young as well as in the adults. As soon as the young are able to leave the nest and waddle about with the aid of their stubby wings, they gather in bands. Instances were noted where the young had evidently left their nests at too early a date, and, being unable to hold their own, had been trampled to death by their larger associates.

We noted several examples of the nuptial excrescence that forms on the upper mandible of the adults during the mating season. I have consulted much of the literature on pelicans, but thus far have been unable to ascertain the function of this curious growth that is lost so soon after the breeding period. It probably bears some kin to the red comb and wattles of several of the gallinaceous birds that seem to function during the same period.

**GREAT BLUE HERON.**—It seems rather strange that a bird with the solitary habits of the Great Blue Heron should be gregarious while nesting. This can probably be explained by the added protection that numbers give. The nests of this bird were found on the east side of the island from some three rods from the water to the top of the crown of the Hat. They were all placed in the low scrubby bushes. Several were usually found in any bush or clump that was occupied. In one case there were seven nests in one cluster. The nests are large masses of well woven twigs. The construction of these nests must have entailed a large amount of labor, considering that they were about three and a half feet across and two feet deep, and twigs, like Winchester in the poem, thirty miles away. The eggs were from two to six in number. They were greenish blue in color and, like the eggs of the pelican, were elliptical in shape, though with comparatively greater diameter.

The herons apparently have the longest nesting period of all the birds living on Hat Island. There were eggs that showed no incubation, incomplete clutches, and young birds that were three-quarters grown, and all the intervening stages.

The young showed no tendency towards sociability either towards each



other or toward strangers. Each brood remained together in the nest apparently until able to fly. They are rather pugnacious in their disposition when approached. They emit a sound that closely resembles the dry "chuck" of the blackbird, while the parent sounds a drawn-out *ah-h-h-h-h*, when the nest is approached. If the stranger goes too close to the nest, the chicks either attempt to retreat, or stand their ground and strike at the intruder, and a sharp click is heard as their mandibles snap together. The young do not belie their reptilian ancestry either in their uncanny long necks and staring eyes, nor in this method of defense by striking. It was a rather impressive aspect that the half-grown herons presented as they stood in stoic, stork-like aspect on their nests, patiently awaiting their usual allowances.

No accurate observations were made of the feeding of the young herons. One instance is perhaps worthy of mention. An adult heron was seen to alight on a rock some rods from a nest of younglings. As the persistent visitor did not leave the vicinity, the bird stood for some time and finally regurgitated what was probably meant to be the afternoon meal of her brood. Upon exam-



Fig. 39. PELICAN EGGS DESTROYED BY GULLS.

ination of the mass of material disgorged a partially digested fish eight inches long was found, as well as the scales of another fish and other material that could not be identified.

GENERAL HABITS OF THE GULLS, HERONS AND PELICANS.—The easy, graceful, flowing type of flight, as well as the soaring of the gulls, was illustrated in countless examples. This slow waving of the wings in flight seems to correlate exceedingly well with this bird's method in starting flight. It is a fact often observed that the gull seldom if ever perches, but rather alights upon the ground where it procures, in this section of the country, the greater part of its food. When the bird starts flight it opens and beats its wings through small arcs, and runs along the ground to gain momentum for a launch into the air. In other words, the gull normally beats its wings so slowly that it can, only with great difficulty, rise into the air by its wings alone, hence it brings into play its auxiliary organs of locomotion. In alighting it is a matter of some interest to note the position of the wings, which are placed in vertical

planes to enable the birds to come to a stop. In addition to this, it was also observed that the bird would occasionally "back water" when alighting.

The herons, when about to rise into the air, would first squat and then usually, without further ceremony, jump into the air and continue in motion with the long steady strokes of their wings. The pelicans likewise had the habit of squatting and then jumping into the air when starting from the ground. They would often squat and bob up several times when the observer approached as if they were undecided as to whether or not it was necessary for them to go through the exertion of launching and flying off with their corpulent avoirdupois. As a rule, when one or more would start to fly, the whole or the greater part of the colony would follow the example, and the air currents from their powerful wings could be felt fifteen rods away. The roar from such concerted flight could be heard for a mile or more.

Figure 35 shows a characteristic scene portraying how the pelicans and gulls refuse to associate in the same flock. The pelicans are occupying exclusively the end of the spit, while the gulls occupy the part next to the island. The Caspian Terns and the gulls, however, were usually seen in the same flocks.

There is an impression current in bird literature and among bird people that requires some modification in view of the observations of our party; that is, relative to the disposition of the gull. His general reputation is as being a mild and peaceful bird and never aggressive. Our observations not only did not confirm this but were decidedly to the contrary. I have previously made mention of the piratical raids upon the nests of the Caspian Terns. In addition to this we saw hundreds of instances of the wanton destruction of pelican's eggs and young by these marauders. Figure 39 shows only a small part of the destruction of pelican eggs by gulls. The eggs were apparently not taken for food, as the shells were not broken in a way that indicated that the contents had been eaten, and many were merely pecked in one or several places. Many young pelicans had been killed by being pecked and many of the living were badly lacerated about the head, back and tail. Mr. Treganza states that he has observed that on some occasions the pelicans had posted guards over their section of the colony before going on a foraging expedition. This is thought to be done to protect the nests and contents from the incursions of the gulls. The gulls around the main part of their colony were continually fighting among themselves and, upon close observation, a great many were seen to have down in their beaks that was as strong evidence as the proverbial wool between the dog's teeth. It can, however, be said to their credit that but two cases were reported of gulls molesting nests of their own species.

We saw no indications that the gulls ever disturbed any of the nests or eggs or young of the Great Blue Heron. Whether or not this was due to the fact that the gulls feel no antipathy against this species or whether it was in response to the modern slogan of "safety first", I am unable to state. However, in view of the forbidding aspect of the heron and the fact that there are usually several adult representatives in and about the colony, I am personally inclined to the latter view.

A day had been spent on Hat Island, and on the evening of the second day our provisions, sleeping equipment and specimens of eggs and birds were packed and our boat was headed for Egg Island some thirty miles to the east.

For a mile or more we heard the dull booming farewells of the pelicans as they arose in concert, presumably rejoicing at our departure.

During the entire evening, and until darkness settled over the lake, we saw a large number of small flocks of the Wilson Phalarope. In fact, one or two flocks of these birds were always in sight, either swimming in the water or skimming along through the air, occasionally executing that maneuver that resembles the flashing of a scimitar as the whole flock suddenly and in concert changes the course of its flight. The swimming birds were evidently feeding upon refuse floating on the lake, contributed, very probably, largely by Bear River.

We arrived at Egg Island about 3 A. M. after a trip that was for the most part uneventful, so uneventful that practically no headway was made for an hour or so during a calm. Egg Island is a small island about ten rods long and four rods wide, located about a mile and a half west of the north end of Antelope Island. It is simply the eroded remains of a ridge of hills that runs under the water, and is formed by the upturned edges of the very resistant quartzite beds. This island is practically barren of all vegetation. A few gulls were found nesting here, and likewise a few Great Blue Herons. There is nothing to add by way of narrative or description of these birds as they were found on Egg Island, except that the nests of the heron were placed on the ground instead of in bushes as was the case on Hat Island.

The special object of interest and also of our visit to this island was the Double-crested Cormorant (*Phalacrocorax auritus auritus*). Of these there were between five and six hundred individuals on and around the island. The nests of these birds were rather artistic. They are six or seven inches deep and about eighteen inches across, and are composed of sticks of a uniform size carefully woven together and cemented with white excrement resembling lime.

The eggs are a greenish blue in color and vary from three to five in number. The breeding season of this cormorant was the earliest of all the birds that we saw on the trip, and extended over a comparatively long period. This was apparent from the presence of partially completed nests, eggs in all stages of incubation, and young birds fully as large as adults and likely to be able to fly within a short time.

The day, May 17, was very stormy, and in consequence our visit to Egg Island had to be curtailed. In fact, three days were required for the homeward journey; but this is another and very different story.

*Pocatello, Idaho, February 10, 1916.*

## NESTING OF THE TOLMIE WARBLER IN YOSEMITE VALLEY

By MARGARET W. WYTHE

**I**N THE summer of 1915, responding to the call of the mountains, I spent a few weeks in Yosemite Valley. Arriving there in the early part of June my visit lasted through a large part of the nesting season in the Valley. Hence one of my chief pastimes became the quest for nesting birds.

It was my good fortune to find sixteen nests between June 12 and July 1.