BREEDING BIRDS OF SCAMMONS LAGOON, LOWER CALIFORNIA

WITH EIGHTEEN ILLUSTRATIONS

By GRIFFING BANCROFT

NEAR THE CENTER of the Peninsula of Lower California, on its Pacific side and just below the point on Vizcaino Bay where the San Ignacio subfaunal district ends, there are a number of salt water inlets commonly called lagoons. These lagoons are seventy miles or more to the east of the regular coast-wise trade routes and so have rarely been visited by other than occasional fishermen in search of turtles or salt. The entrances are blocked by bars. These lagoons are becoming shallower as the sand drifts in, and the change is sufficiently rapid to be noticeable from one decade to the next. Within the memory of many men now fishing, all but one of these lagoons have practically become closed to power boats and even that one, Scammons, has become decidedly dangerous to enter or navigate.

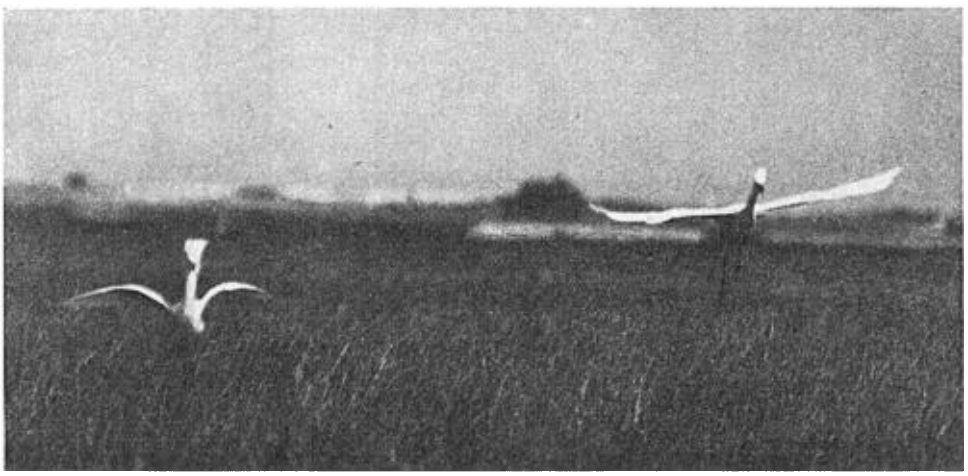

Fig. 13. BREWSTER SNOWY EGRETS, AND THE MARSH AT SCAMMONS LAGOON, LOWER CALIFORNIA, MAY 24, 1926.

Wright M. Pierce, photo.

Scammons Lagoon is approached over a wide bar, followed by a run of eight miles between two lines of breakers that mark the channel. The bay itself is about ten by forty miles, running inland in an easterly direction. There are two main channels having a good depth of water, and there are islands, tidal islands, and many blind channels. The shore line is somewhat varied. By far its greater part borders a flat, gently rising desert with a sparse growth of "sage". There are a few low sand-hills, presumably blown up by the wind, and at least one line of earthen cliffs of twenty to thirty feet height. There are areas of high sand-dunes that are shifting and support no form of life. Conversely, a small portion of the mainland tidal flats, in protected spots here and there, is covered quite heavily with marine growths. A geologically recent ocean bottom surrounds the lagoon; and a wind as fierce and continual as any on the North Pacific Ocean blows only from the west. So we find the islands, which usually run north and south, to be little more than crescent shaped beaches

backed by slightly higher and almost level strands. Over them, sometimes nearly as thick as a fog, sand is carried a mile or more to the leeward where it builds up a shallow marshy country that has become heavily overgrown.

The greater part of the general area is covered with tall salt-water grasses somewhat related to the tules, though on the drier spots tiny fields of salicornia have taken hold. There are about six non-tidal islands of this nature. There is one island, presumably blown up by the wind; it is about ten miles long and a hundred or more feet in height, covered lightly with the characteristic "sage" of the country. This we did not visit, partly for lack of time and partly because any land birds we might find breeding there would only technically belong among the birds of Scammons. The surrounding country is a desert, almost flat, and barren save for a stunted growth of scattered bushes. There is no fresh water; there is no human nor domesticated life. Such is Scammons—dreary, inhospitable, forever battered by the crudest forces of nature.

With the coöperation of the San Diego Natural History Society and the two men it sent to prepare skins, together with Mr. Wright M. Pierce of Claremont, to whose skill I am indebted for all the accompanying photographs not otherwise accredited, and Mr. A. T. Kroeckel of Escondido, who volunteered to help the San Diego Zoological Society, I had the pleasure of spending the last few days of May of 1926 listing the breeding birds of Scammons. The San Diego Natural History Society has all the skins taken and has given me the fullest facilities of its staff in an endeavor to identify the birds we found. While this paper cannot make any attempt to analyze the status of the doubtful birds, nor to assign names, it does not seem advisable in all cases to follow without question the nomenclature generally assumed. As far as I am aware we were the first party of ornithologists to visit and report on Scammons. Our breeding records are nearly all of birds not previously known to nest within several hundred miles of the lagoon. I give their occurrence as facts which I have personally observed, but the subspecific status, as indicated, is often a matter of conjecture.[1]

WESTERN GULL

One of the birds we watched with special interest on our way south was the Western Gull. Taking into consideration knowledge gleaned on previous trips on the mainland, together with the skins we collected from island to island as far as San Geronimo, there seems to be no doubt that *Larus occidentalis wymani* extends coastwise south at least to Point Rosarito, the beginning of the San Ignacio sub-faunal district.

In the lagoons we might logically have found either the northern *Larus occidentalis wymani,* or *L. o. livens* extending northward from Cape San Lucas, or an intergrade between the two, or even possibly a new race from the western shores of Baja California del Sud. As a matter of fact the skins we took were pronounced by the staff of the San Diego Natural History Society to be *L. o. wymani,* and there is much to justify that opinion. In breeding, the gulls in Scammons showed a tendency to seek the higher spots, they confined themselves to a few islands, they laid occasionally in isolated groups of a pair or two, and they built very unsubstantial nests. They did not particularly seek for the inconsequential protection offered on the islands. Their breeding season is from the middle of May—whether onward or not it were hard to say; for the later layings may be due to repeated thefts of the earlier. Of course the nests vary greatly, but the one illustrated herewith is quite typical. The legs of the

[1] NOTE.—The purpose of this paper is to record the facts discovered in Scammons Lagoon. The editor of THE CONDOR is not to be held responsible for the conclusions drawn from those facts.—*Author.*

birds showed none of the characteristic yellow of the Gulf gulls; in fact, at least so far, we have no evidence that the birds are not pure *wymani,* except for the length of the egg shells.

The value of egg dimensions depends almost entirely on the proper application of the rules of mensuration. The differences between averages are small when compared with the marked variation of individual sizes within a series. So it is necessary not only that the instruments be handled by an expert but that sufficient material be used. It is also highly desirable in comparative work that the measuring be done by the same individual because the personal equation is very pronounced. So far, generally speaking, the precautions taken have not been sufficient to justify ornithologists in giving to oological dimensions the consideration I believe they deserve.

I have checked my own work with much care and I am convinced that average egg sizes, if carefully obtained, constitute one of the important factors in analyzing bird

Fig. 14. NEST AND EGGS OF WESTERN GULL (subspecies ?) AT SCAMMONS, MAY 23, 1926.
Wright M. Pierce, photo.

life. I have had experience with instruments of precision and find, by re-measuring, that I can maintain an accuracy to the closest fiftieth of an inch. Where I have the material available I keep on adding measurements until my averages are almost constant, and I do not believe their error will then exceed one one-hundredth of an inch. With the personal equation eliminated I feel safe in using figures as a basis from which to draw positive conclusions. The conclusion in the case before us is that the gulls in Scammons are not the same as the birds which breed off the coast of southern California. That belief is based on the following figures, in inches, all from eggs personally taken and measured.

Todos Santos and Los Coronados Islands,	50 eggs	2.78 x 1.95
Scammons Lagoon,	50 eggs	2.89 x 1.98
San Luis Island,	30 eggs	2.89 x 1.99

It is much easier to detect the adulteration shown here in size than to locate its source. It cannot come from the north, as the ranges of *L. occidentalis wymani* on the American shores and on the western side of the Vizcaino Desert subfaunal district to its southern extremity have been thoroughly worked out and are understood. I think it equally safe to say that it does not come from the near-by Gulf of California. Certainly it does not do so directly. It is only in the sizes of their respective eggs that there can be found any similarity between the birds of the two seas.

The nests of the Gulf gulls are bulky affairs, many two or three feet long, built to a thickness of several inches with fibrous sea weed. They are not placed on the plateaus of the islands but rather among the boulders or against the bottoms of cliffs near the waters' edge. If there were any intergradation with *wymani* in the Gulf or with *livens* in the Pacific it would become apparent where instincts oppose each other as strongly as in these two races. For the nests of Scammons, as I found and described them, are pure *wymani*. This, too, in spite of the fact that there are places where the peninsula is scarcely fifty miles across, and a bird at moderate height could actually see into waters thickly populated with gulls of the other race. Crossing from one shore to the other either is not done, or is so rare as to have no influence. I have carefully studied the legs of both *livens* and *wymani*, and neither I nor any of the trained observers with me have ever seen either outside of its proper range.

With the gulls of the Gulf clearly out of contact we are thrown back on southern influences to account for the size of the eggs in Scammons. Only a thorough survey of the western shore of Baja California del Sud can give a trustworthy answer, for as yet we do not even know whether *livens* and *wymani* are distinct species. They may intergrade into each other farther south, or a distinct race may lie between San Geronimo and Cape San Lucas.

CASPIAN TERN

This bird as a salt-water breeder in the Californias is so far known only from San Francisco Bay and from Scammons Lagoon. In the latter place it nests usually in company with the Royal Tern, with this noteworthy exception, that while the colonies touch each other they do not intermingle. The Caspian builds a nest at least as pretentious as that of the gull. The one illustrated herewith contains the only set of three eggs which we found. The photograph was taken during such a heavy wind that a large part of the egg cavity was filled with drifting sand while the camera was being adjusted. San Francisco Bay throws no new light on this subject because local conditions there give the birds no opportunity for natural expression.

Through a misunderstanding we brought home no skins of this bird and have to fall back upon our eggs for identification. However, there is a very decided difference in texture, shape, and marking between the eggs of the Caspian and the Royal. This is apparent even in photographs. The normal complement of *Sterna caspia*, as we found it, is two eggs, and the bird will breed occasionally in isolated pairs, something *maxima* never does. To these differences we must add the all important factor that one always builds a nest while the other lays on sand without so much as scratching a cavity.

The Caspian Terns were not at all common. We made no effort to estimate their numbers in the air, but we found only a score or so of occupied nests. From reports from other sources they must be a very rare bird between Cape San Lucas and the vicinity of San Francisco. The nesting date is apparently early in June in normal years—rather later than with the Royals. We found only three small colonies.

What little data we have from the west points toward the possibility of there being more than one form of Caspian in North America. After writing my notes I

Fig. 15. NEST AND EGGS OF CASPIAN TERN; SCAMMONS LAGOON, MAY 24, 1926.

Wright M. Pierce, photo.

turned to Dawson's *Birds of California* and found that in our remarks on these birds we hardly had a fact in common. Mr. Bent gives the breeding range as "west to central California", which is correct as far as it goes; and Mr. Dawson, while giving some fresh-water records near-by, declares the bird does not nest in California. It is strange that near the Atlantic Ocean and in the Gulf of Mexico the Caspian Tern is a wide-spread breeder showing an apparent preference for salt water, while in the west ours is the first printed record of its breeding in the Pacific at all, though large numbers are known from places at no great distance inland. Their nesting habits over the continent as a whole are so contradictory as to deserve a special analysis.

Our discoveries in Scammons merely introduce one new factor. I could not procure enough eggs to do more than convince myself that the average size of Scammons-taken eggs is appreciably larger than is the general average elsewhere. It must not be forgotten that all we have actually proven is that these are not the Royal Tern.

ROYAL TERN

I must admit a feeling of real elation when I discovered an active tern colony on one of the islands. The spiral of flying birds and the chorus of angry cries are the means by which these gentle creatures protect their own. The white cloud was like a flattened whirlwind and brought a touch of action to a scene otherwise too drab and peaceful. When the terns were identified as Royal I was among old friends. I knew them to be breeders on San Roque and a number of islands to the south as well as in half a dozen places on the Gulf, but this is the first record among the lagoons of Vizcaino Bay.

In March of 1926, lying in the lee of George Island in northwestern Sonora, I watched Royal Terns for several days while they were trying to establish their colony. Getting started is a serious problem, for the eggs on the outer fringe are very easily taken by the gulls, there *Larus heermanni.* When we arrived at George Island the terns had not begun to lay, but during the first night they deposited seventeen eggs. Not expecting to remain, we took these. The second night the birds moved to another corner of the island. After they had laid some twenty eggs there came a heavy non-seasonal rain. So the third morning found them back at their original haunt. There were twenty-three eggs when we left, and probably a few of these survived the day. Indeed it is possible that from that time on the colony began to lay them faster than they were lost. Even yet all was not plain sailing. On April 22 of the year before (1925) I had found this colony on the same spot. At one end of the egg field at that time a few young had just hatched and many eggs were pipping. At the other end birds were still laying. One could trace, by the state of incubation through the colony, something of the long series of tragedies that had taken place. The terns seem so helpless against the gulls from the time the egg is laid until the babies are well grown, that one wonders how a bird that lays but one egg can hold its own.

When the young hatch, instead of remaining in the nest they gather into a small flock. To all appearances they are fed and protected by the parents as a communal institution. But before this is accepted as the correct diagnosis of their nursery habits, attention should be paid to pigmentation. I have slept more than once beside a Royal Tern colony and studied their lives from my blankets at a distance of a few feet. These terns, on their eggs, are very nervous. Every little while a large proportion if not the whole colony will take wing, fly about screaming for a moment, and then settle down again to incubate. I was able to work out regarding some of the indi-

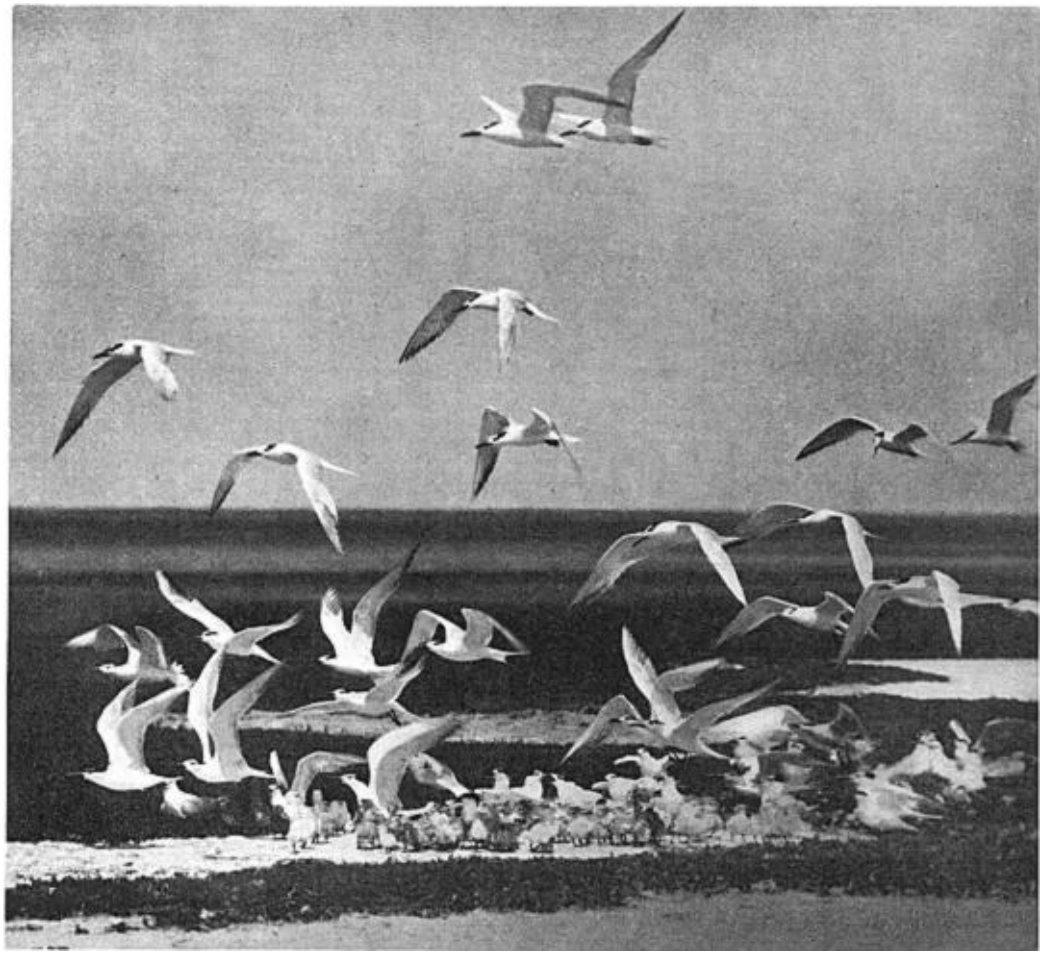

Fig. 16. ROYAL TERNS GUARDING THEIR YOUNG; SCAMMONS, MAY 23, 1926.
Wright M. Pierce, copyrighted photo.

vidual birds that each always returned to the eggs she had left. Indeed, the settling process was so rapid and so lacking in confusion that every bird must have been searching for her particular nest.

I presume, therefore, that one of the factors that make for safety, for rapid return, is that the variations in the color of the eggs quickens recognition. Pigmentation, however, goes farther than this. The downy young vary in color even more than the eggs. This is in face of the fact that throughout the bird world in general chicks just hatched resemble each other, species by species, almost to the point of being facsimiles. Since Madam Nature is not given to wanton vagaries, the only conclusion I can draw is that each parent seeks out and feeds her own young. Of course it may be that the community theory is correct—it certainly appears to be when one watches a huddle of young constantly surrounded by a swirl of flying protectors. I offer the other suggestion merely as my personal belief.

The nesting period of these terns varies with different colonies, even on the same islands. My Gulf records show fresh eggs from May 20 to April 25; the latter date probably by no means marks the end. In Scammons I believe from early April until well into June would cover the laying time. I have not sufficient data on which to base an answer to the question of a second laying after the first has been raised. My opinion is that they raise but one brood. I often wonder how they do that well.

Mr. Dawson had a highly imaginary theory that since these birds do not nest in Pacific waters they must cross the continent, probably at some narrow point, and there mix with their kin in the Atlantic. If they did so we would expect to find the Royal Terns all of one subspecies. As it is, geographical isolation should produce a western form. Here egg measurements again come into play.

A. C. Bent, in Bulletin 113, United States National Museum: 54 eggs average 2.48 x 1.75; Scammons, 50 eggs average 2.53 x 1.75; Gulf, 50 eggs average 2.59 x 1.77. I regard the last two sets of measurements of as much importance as any I have made. The eggs were personally taken as well as measured, and though the difference in size may seem small, it is very constant. The only conclusion I can draw from these figures is that there are two western forms, the larger of which is possibly peculiar to the Gulf. I quote a letter which, though disappointing, substantiates this reasoning:

October 16, 1926.

My dear Bancroft:

You will be interested in knowing that we do not (at present) believe that the Royal Tern of Lower California is sufficiently differentiated to be formally named. Comparison with eastern specimens shows an average size difference of about five per cent (5%) in favor of the western bird, but even this difference is not at all constant and only a very small proportion of birds are, with reasonable certainty, to be distinguished. Possibly examination of a series of skeletons from the two areas will bring to light recognizable characters.

Sincerely,
A. J. VAN ROSSEM.

ELEGANT TERN

Half a dozen eggs of *Sterna elegans* were found intermingled with those of the Royal Tern. Of the six colonies of these terns I have visited, the two birds have always been together. The smaller clearly wait until the larger have laid and then, considerably greater in number, drop in among them to secure what protection they can. Neither species builds a nest, nor even so much as hollows out a site in the sand. When the parent of either comes up from the leeward she squats directly behind her eggs and pulls them underneath her with her bill. The breeding of the Elegant Tern in Scammons does not greatly enlarge its known range, for there are colonies on San

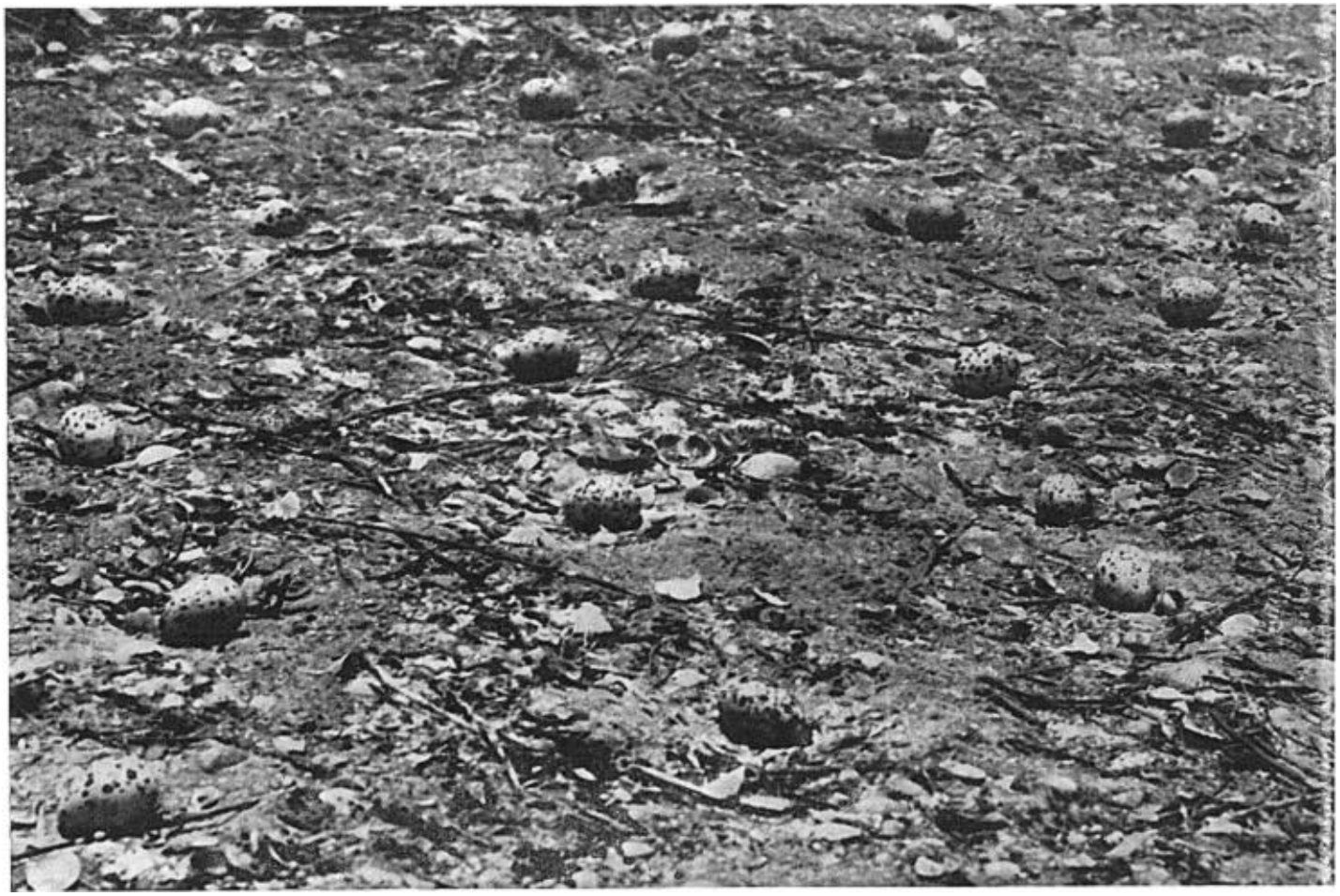

Fig. 17. EGGS, IN SITU, OF THE ROYAL TERN; SCAMMONS LAGOON, MAY 23, 1926.
Wright M. Pierce, photo.

Roque Island in the Pacific and on George Island and on Isla Raza in the Gulf. But it is a matter of interest to know that this tern does pass Point Eugenio and breed as far north as the lagoons of Vizcaino Bay.

We were too early for the regular laying of the birds, and however interesting their life history may be, it was not gleaned from information obtained in Scammons. The dates, as are so frequently the case, are here several months later than in the Gulf—laying beginning in March or April in one case, and in the other in June. The endless variation in egg markings is suggested in the illustration, though the colors do

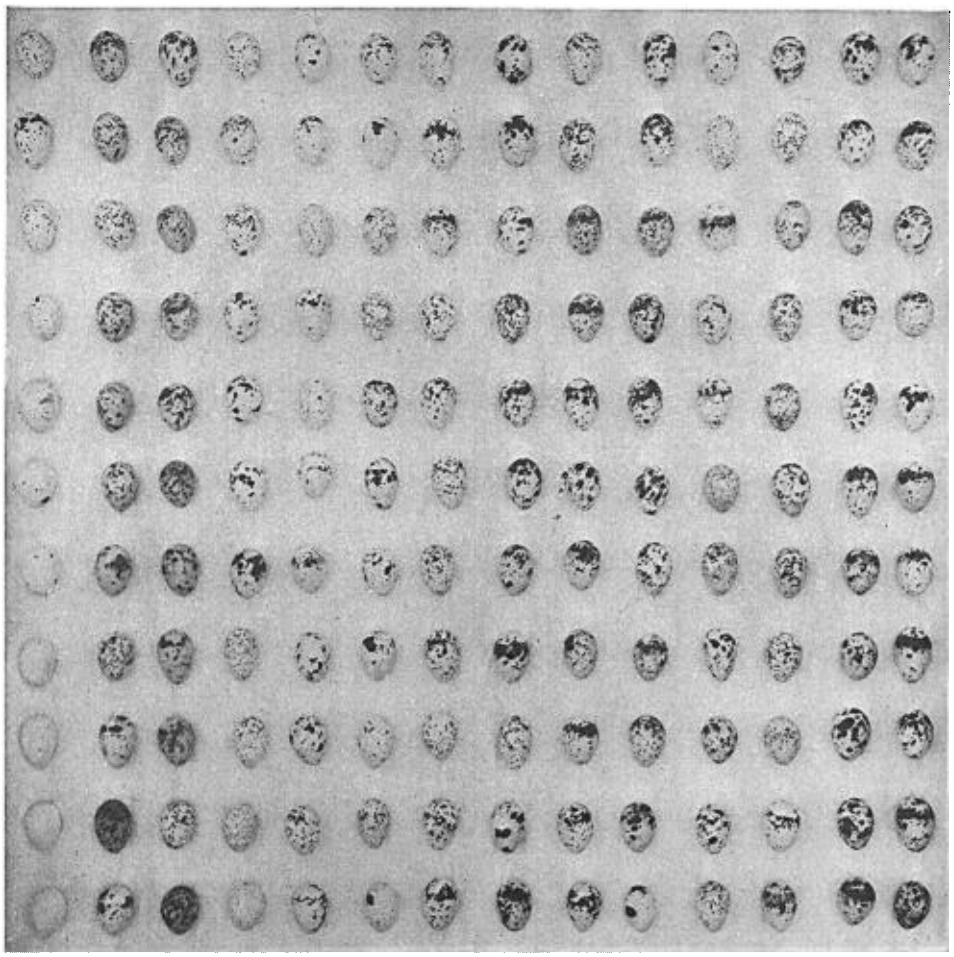

Fig. 18. CABINET SERIES OF THE EGGS OF THE ELEGANT TERN.
Photo by the author.

not show. The ground is blue, red, tan, white or slate, and the spots, scrawls and blotches include all of these except white and in addition black, which predominates.

BROWN LEAST TERN

The breeding colonies of these small terns occur at spots here and there down the coast from Monterey Bay. I have found them almost to the Mexican line but never south of it, though I see no reason why they are not to be expected there. Scammons

Lagoon now stands out as the most southerly record. We did not see the birds on this trip and my authority for listing them as breeders rests on a set of eggs brought me from Bird Island. This identification, however, meets the requirements of science, as there are no other eggs with which these can be confused and the collector is thoroughly reliable.

The subspecies *browni* has not been acted upon by the A. O. U. Committee. I have photographed a small series of eggs carefully selected as normal types. The three upper rows are from the east coast, therefore *Sterna antillarum antillarum*.

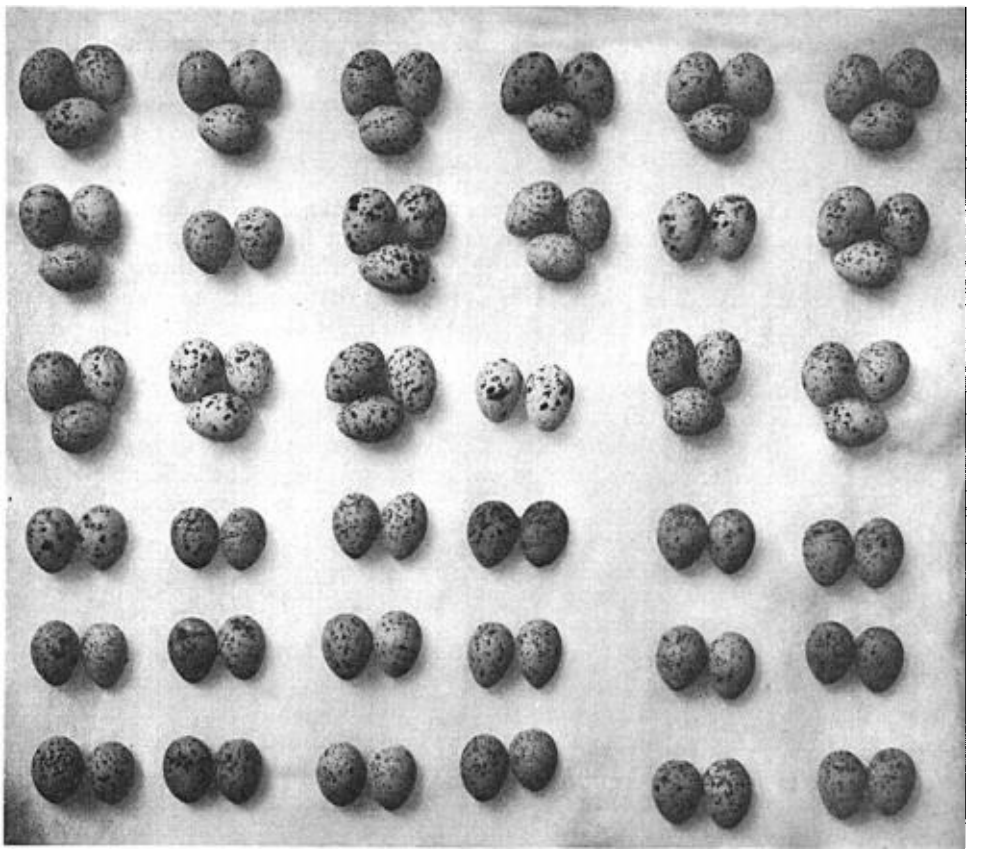

Fig. 19. CABINET SERIES OF THE EGGS OF THE LEAST TERN.
Photo by the author.

The rest are from San Diego County (except the set in the extreme right-hand corner, which is from Scammons), and therefore *S. a. browni*. I think the illustration tends strongly to prove *browni* to be a valid subspecies, because its eggs average decidedly darker in color and are almost without the usual brilliance shown in the other subspecies. Sets of three are common in the east, while with us two is the limit; at least three's are so rare that I still have my first of this number to find. The birds lay in Scammons about the middle of June. Personally taken measurements of nearly all the eggs in the illustration show those of both races to be remarkably near the same size, namely, 1.20 x .90 inches.

FARALLON CORMORANT

Farallon Cormorants (*Phalacrocorax auritus albociliatus*) are the only members of their family to breed here, but these ubiquitous birds have not neglected the lagoons of the San Ignacio District. However much out of place they may seem on level beaches, several small colonies are scattered through Scammons. In groups of from ten to thirty we found about eighty occupied nests. Most of these contained young which were not as uniformly developed as one would expect of such closely colonized breeders. So, if we assume the first week in April to be the height of their laying season, it is an approximation only.

The building materials used are coarse twigs. Even in such a place as Scammons, where sea grasses are abundant and roots and branches rare, this cormorant will make no compromise with its instinctive desire for coarse sticks and ventilated and almost unlined nests. The soft sea weeds favored by *penicillatus* are strictly taboo; instead we have a structure of the roughest nature, with neither matting nor lining in the cup.

GREAT BLUE HERON

Our acquaintance with this bird in Scammons is confined to one adult which was seen at a distance, and to five young which we brought home and gave to the San Diego Zoo. The fledglings were all but ready to fly, which would throw the laying date back into March. The parent birds were so shy that we did not even see them; they probably deserted their families as soon as we set foot on their island.

There were three used nests in the bushes shown in the central background of the picture of the Brewster Snowy Egret. These structures were so large and deep that I suspect the old birds of repairing and adding to them as the families grew. Whether they represented two broods of the current year already flown or whether they were left-overs from a former year we have no way of determining. The building materials were chiefly sticks as coarse as could be found. No attempt at lining was made, except to place some smaller twigs in the center.

We can make no intelligent guess as to subspecies here. Perhaps when the young reach maturity they will determine the matter for us. They might possibly be the Californian race, *Ardea herodias hyperonca,* though a bird of the San Diegan District is hardly to be expected here. More likely the San Ignacio District will be found to extend south to Magdalena Bay, in which case we might assume them to be the Espiritu Santo Heron, *A. h. sanctilucae.* There is always to be considered the unidentified form from the San Luis Islands in the gulf directly opposite. The individuals in Scammons resembled these closely in their nesting habits and unbelievable shyness. That introduces the possibility of a new bird, or of *A. h. treganzai.* They may be the same form as the birds which used to nest on San Martin Island, or even as the stray I saw on Todos Santos Island in April, 1924. Altogether it appears there is much to be learned on the distribution of the races of *Ardea herodias* in Lower California.

BREWSTER SNOWY EGRET

The nests of these birds were confined to the marshes behind two of the islands. The colonies in both cases were fairly compact and tended strongly to occupy the higher ground where the grass was rank and the overflow negligible. Perhaps half of all the nests within the area they pre-empted belonged to these egrets; the others being those of four genera of herons, as well as the reddish egret and the rail. Late May and early June appear to be the normal time for them to lay. Nearly all the sets we found were fresh or slightly incubated, but 1926 was apparently an early season for all western birds.

Fig. 20. NEST AND EGGS OF THE BREWSTER SNOWY EGRET; SCAMMONS LAGOON, MAY 24, 1926.
Wright M. Pierce, photo.

We experienced a great deal of difficulty in identifying the nests of these egrets, especially where the Louisiana Heron bred with them. By concealing ourselves and waiting patiently, usually less than half an hour, the parents would return. The Night Herons came first, then the Louisiana, and last the Brewster Snowy Egret, *Egretta thula brewsteri.* The birds of the latter species were considerably disturbed by our presence, but at the same time could not bear to leave their eggs exposed to the gulls. They seldom flew directly to their nests; instead, after circling around several times, they dropped into the marsh at a little distance and walked the rest of the way. Then they stood on guard for quite a while. When they did settle down to incubate, they were hidden from view except from above, as were all the marsh nesters.

The sets were usually of three or four eggs, with an occasional five. The building material was largely the stalks of the marsh grasses, with whatever fine dead twigs or roots the birds could find. The size in the accompanying photograph is very typical, though the nest appears to be much thicker than it really is. It is not very flexible and is supported from below by resting on the grasses. There is neither pretense of a foundation nor of any attempt to tie up to the tules.

When the San Diego Natural History Society identified the egret in Scammons as the Brewster, we cut in half the great stretch where it was unknown. *Egretta thula* breeds in the Delta of the Colorado; I have often been told so by aigrette hunters and have seen an immature as a pet running around a farm yard. It does not require any more stretch of the imagination to connect the bird of the Delta with the bird of Scammons than to assume the latter to be the same as those common near La Paz. Now if my reasoning be correct, no *thula* north of the Delta can be anything but *E. t. brewsteri.* Those I have found breeding in the San Joaquin Valley and those from the Great Salt Lake Basin are pocketed and isolated from any Atlantic forms. It is true that *brewsteri,* within the United States, may break into two forms, for some of the geographical isolations are vast. But I believe it demonstrated that *Egretta thula thula* does not occur in the Western United States.

I have measured forty Florida eggs in my collection and compared them with the same number from Scammons: Florida, average 1.74 x 1.30; Scammons, average 1.77 x 1.32.

REDDISH EGRET

Adjacent to the Pacific Ocean the Lower California Reddish Egret (*Dichromanassa rufescens dickeyi*) does not breed north of the San Ignacio District. On the Gulf side of the Peninsula there is a small colony on San Luis Island and on one other island of the archipelago. The bird is not reported from California and Arizona, but I have good reason to believe it nests in the Delta region—in which case it probably has visited both states, though unfortunately not observed.

The colonies in Scammons and on San Luis show nesting instincts distinct from each other, though whether this is a matter of adaptability or of isolation requires more information to determine. The nesting sites of the Gulf birds, for instance, are in a thick head-high form of salicornia. As far as possible, when building, the Gulf birds force their way into the brush for the protection and concealment it offers. They seek some height and the nests are rarely placed less than four feet from the ground. In Scammons they are rather indifferent about the location chosen. Some of their nests are out in the marsh, more are on the open beaches, while not a few lie along the border between the grass and the sand, especially where there is a bank a foot or more high. They colonize much more than do the birds on the Gulf. A few rebuild cormorant nests, but most place their flat structures of long fine twigs directly upon the ground. The Scammons birds show no preference for what little salicornia there is.

The breeding dates are not easily ascertained, because of the depredations of the gulls and because the season is so long. The season in 1926 was early among all our breeding birds. While on the western shores of the Peninsula during the last days of May there was an occasional nestling (none a week old), we usually found nearly fresh eggs or incomplete sets and drew the conclusion that early June is the normal laying time. It is interesting to compare this date with San Luis Island, not much more than a hundred miles to the north. There the breeding season is almost three months earlier.

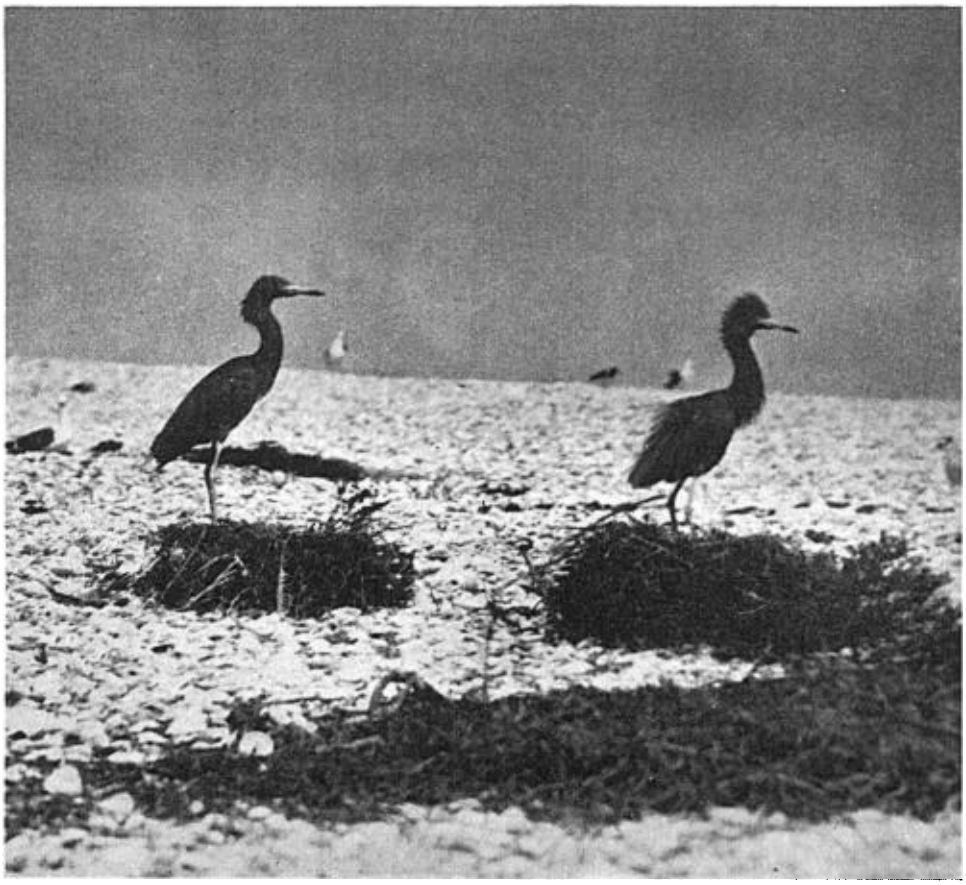

Fig. 21. PART OF A SMALL COLONY OF THE LOWER CALIFORNIA REDDISH EGRET; SCAMMONS, MAY 23, 1926.

Wright M. Pierce, photo.

It has been said that *D. r. dickeyi* does not occur in the white phase. I cannot disprove that belief, but came very near it when I found a variegated bird sitting in an egret colony. With the exception of the barest tinge, all her normally red feathers were pure white and the others had less than half their usual brilliancy.

The eggs of these birds are much larger than those of the eastern race:

Scammons Lagoon:	1.96 x 1.49
San Luis Islands:	1.96 x 1.43
Eastern eggs in San Diego collections:	1.82 x 1.34

LOUISIANA HERON

This heron in Scammons is a marsh breeder. Its light, flattened nest rides on living grass with the higher tides often flowing beneath. Well out from shore, frequently as far as is safe to build, it makes its home. It seems to show a stronger preference for the edges of small pools and little drainage streams than for the proximity of other birds of its own kind. Quite a few do lay close to the sand-dunes, where they are surrounded with egrets and different herons; but this companionship, I think, is more a matter of accident than of design.

The nests of *Hydranassa* are almost indistinguishable from those of the Brewster Egret and the Yellow-crowned Night Heron. I have noticed all through the Ardeidae

Fig. 22. NEST AND EGGS OF LOUISIANA HERON; SCAMMONS LAGOON, MAY 24, 1926.
Wright M. Pierce, photo.

a tendency on the part of the birds to make free with the homes of others of the family, and I believe that one reason why the nests of these various birds in Scammons are so nearly alike is because occasionally more than one pair have had a hand in the building. Then, too, the choice of material is limited.

It has been assumed since the days of Brewster that this species nests along the west coast of Lower California, but as far as I know the present is the first published record of their so doing. I feel that my familiarity with the coast line warrants the statement that the San Ignacio lagoons mark the northern limit of their breeding range. I might go farther and add that no herons nest on the Pacific side of the Vizcaino Desert nor in the San Diegan District south of a small colony of the California Blue Heron ten miles from Tijuana.

The heron we are discussing is one of the latest to breed. Ordinarily I would expect it to begin about the first week of June. Usually three eggs are laid, but fours are not unusual. Many nests contain but two, and once in a while a five is found. The birds are not at all common in Scammons; there are probably not over seventy-five pairs.

In naming this bird, or rather in carefully abstaining from so doing, I have taken into consideration the fact that if it is a bird of the western coast only, it should not bear the name of Louisiana at all. The evidence pointing toward a new subspecies

Fig. 23. NEST AND EGGS OF THE BLACK-CROWNED NIGHT HERON; SCAMMONS, MAY 24, 1926.

Wright M. Pierce, photo.

here is largely a matter of following the history of other water birds. One by one those common to both coasts have been subspecifically separated because isolation has endured so long that real differences have developed. Sometimes the distinctions are so deeply hidden that it has taken much time and patience to define them. Almost uniformly, between similar birds of the Pacific Coast on the one hand and the Gulf of Mexico and the Atlantic Ocean on the other, the western eggs are larger, and those of *Hydranassa* are exceptionally so, as follows:

Average from Scammons Lagoon:	1.83 x 1.56
Average of eastern eggs in San Diego collections:	1.73 x 1.27

The line of reasoning that shows that it is virtually impossible for this bird to be *Hydranassa tricolor ruficollis* is the same as will be used a few paragraphs below in dealing with the Yellow-crowned Night Heron.

BLACK-CROWNED NIGHT HERON

In the photograph of the Brewster Snowy Egret reproduced in this article some bushes can be seen on the beach. These are the favorite though by no means the exclusive breeding sites chosen by the Black-crowned Night Heron. The nests are not placed on the top of the brush but rather on the sides, half way up or less. There is nothing to suggest any attempt at concealment, nor a persistent tendency to colonize closely. A dozen nests may be within a radius of a few yards, while on the other hand one is apt to find scattered or isolated pairs almost anywhere, particularly in the marshes. There, however, they have a marked tendency to crowd close to the sand dunes. The number of this species breeding in Scammons is not large; a hundred pairs would include them all, to the best of my judgment. They probably commence laying about the middle of April. They are the least shy and decidedly the most nocturnal of the herons.

The photograph of the eggs and the nest presented herewith is so characteristic that a careful examination will tell the details of construction. The building material is in sharp contrast with that of the other herons, although much finer than the Farallon Cormorant selects. There is very little variation from the type illustrated, so little, in fact, that this was the one heron we were content to identify by its nest. These are the most northerly breeding grounds of this bird on the Pacific side of Lower California.

The dates of nesting are very irregular. I believe at Scammons the birds lay from the middle of March to the middle of June. Half-grown young to fresh eggs showed the variations of individuals. The most valuable feature of the discovery of this heron nesting in Scammons was the connecting of probable breeding ranges south to Cape San Lucas and thence north through the San Luis Islands and the Delta up the California valleys. There was nothing either in the breeding habits or in a careful comparison of Scammons eggs with a series taken near Los Baños to suggest any differences between the Mexican and the San Joaquin birds. The subspecific status of these Night Herons is a California problem.

YELLOW-CROWNED NIGHT HERON

This is the rarest of the larger breeding water birds we found in Scammons. Our take was limited to a single set, though there were many breeders that kept well out in the marshes away from the bedlam on the beach and in relatively deep water. The birds were so shy that when we did flush them it was hard to tell with any certainty which nest, if any, they came from, and furthermore every indication pointed to our being much too early for them. The occupied nest we found, and all other nests which might have belonged to this bird, was so like those of the Louisiana Heron and the Brewster Egret that we were unable to distinguish the three. The importance of this fact lies in the psychological difference between the Black-crowned and the Yellow-crowned night herons. The former, driven by powerful instincts and in the face of considerable difficulty in finding materials, determinedly builds with thick twigs or small branches. The latter, in Scammons, uses dry roots and grasses and fine twigs. A comparison of the two accompanying photographs readily shows the difference.

The finding of these birds laying in Scammons and on the San Luis Islands marks the northern line of records for the west coast. They have not been reported so far from either California or Arizona, and while that negative evidence is not conclusive,

it does show that San Luis and Scammons are, with the exception of the unknown possibilities of the Delta, their most northerly outpost. Of course they may and probably do wander to the river flats, and perhaps they breed there in numbers along the southern tip. Strays are to be expected at any time north of the international boundary line. But for all practical purposes it may be assumed that the northerly normal range of this heron is confined on the west to Mexico.

There is no attempt here to prove the existence of a western race to replace in Pacific waters the Yellow-crowned Night Heron of the Atlantic. But the extreme probability of such a condition is shown by the analogy of almost every water bird that is resident in the Pacific Ocean and whose contact with eastern races has been

Fig. 24. NEST AND EGGS OF THE YELLOW-CROWNED NIGHT HERON; SCAMMONS, MAY 24, 1926.

Wright M. Pierce, photo.

broken by the Rocky Mountains. The nesting habits of the true Louisiana Heron show psychological differentiations which one would naturally expect to be paralleled with physical differences. Certainly it does seem that these facts at least require the assumption that separate races of both *Hydranassa* and *Nyctinassa* are represented in Scammons Lagoon, unless strong proof to the contrary can be obtained.

RAIL

I had known for several years from my fisher friends that a *Rallus* breeds in Scammons. Accepted authorities extended *R. levipes* south to San Quintin, while from the south *R. beldingi* was recognized as far as Magdalena. My interest in knowing what was breeding half way between was keen enough to be the principal

motive that took me to Scammons. We were fortunate enough to secure four adults, which the staff of the San Diego Natural History Society has identified for me to be *Rallus beldingi.*

There is a chain of bays and inlets along the coast to Magdalena and there are many reasons for believing that rails breed in all of them. None are so widely spaced as to isolate the birds of one lagoon from the next, and therefore it would seem quite logical to suppose that one species might occur in them all. In Lower California there is remarkably little north and south change as compared with California itself. On the other hand there is a vital point to be taken into consideration, namely, Scammons

Fig. 25. NEST AND EGGS OF THE RAIL OF SCAMMONS LAGOON; MAY 24, 1926.
Wright M. Pierce, photo.

is the most southerly of the lagoons that are free from mangroves, and it is hardly safe to assume that this rail is not new, as he lives neither in the mangroves nor in the Vizcaino Desert subfaunal area. It is beyond the province of this paper to go into the study of skins, so I will confine myself to the statement that the Rail in Scammons is neither the Belding nor the Light-footed, nor intergraded with either, but a new and separate species.

I found four occupied nests. The first contained three eggs which we could not save, as they had been abandoned when the mother left with her brood. This nest was over water a foot or more deep and was fastened to the heavy marsh grass. It

was quite large, of the semi-floating type, similar to the third nest, which we photographed. The second set was well up on dry ground, slightly protected by dead grass and by an osprey nest near-by. It contained two eggs, an incomplete set, with one egg hardly half normal size. The fourth nest contained five babies just hatching. The mother flushed scarcely a yard from my feet. She had built in short salicornia much after the manner of the meadowlark, and thirty feet from the water. All the nests were on one island, though we did see signs of the birds breeding elsewhere. These notes comprise our full knowledge of the breeding habits of these birds.

We cannot do much toward distinguishing the eggs of this rail from those of other species without the aid of a larger series than anyone has hopes of obtaining. When first found, we all noticed a peculiar pink flush on the surface of the shell, but that already has largely disappeared. The set of seven averaged 1.79 x 1.19 inches. The downy young were a lustrous jet black, their feet the same color, and their bills partly yellow. Excluding one runt, the other four averaged 3.6 inches in length.

BELDING WILSON PLOVER

Mr. H. H. Bailey in his *Birds of Florida* comments on the fact that the Wilson Plover will lay only among the colonizing Least Terns. So strong is this predilection that the plovers adapt themselves to the marked variation in the nesting dates chosen by their hosts. This is not a universal habit of the Wilson; but, as there are benefits derived in the southeastern United States by protection from raids of the gulls, it is easy to understand that advantages would accrue in Scammons Lagoon. More insistent and pilfering birds than the gulls of the San Ignacio District it would, indeed, be hard to find.

In any event, in the closing days of May, 1926, the Brown Least Tern had not appeared nor had the Belding Plover (*Pagolla wilsonia beldingi*) commenced to lay. The breeding grounds of the latter had been chosen and the nesting cavities excavated. Hours of diligent search were rewarded only by a broken egg-shell, but this makes Scammons the most northerly breeding ground of record. True, the bird does wander as far as San Diego County, where Mr. A. M. Ingersoll was alert enough to take a specimen in 1894, and there are many as yet unvisited beaches along the shores of the San Diegan and Vizcaino Desert districts. On the other hand, it may be more than a coincidence that this plover breeds in the extreme northern tip of the San Ignacio District and has not been found past it.

The egg taken was readily identified by several oologists to whom I showed it. We saw no other birds whose eggs could in any way be confused with these, and the record stands without qualification. The islands on which these plovers congregated were not inhabited by any of the other birds we have discussed. The plovers preferred dust and soft dry sand and bushes and abhorred the marshes. Their nests were usually well back from the water.

SNOWY PLOVER

These little denizens of the beaches must lay about the last week of April in Scammons. We found many chicks on the great black flats when the tides were down—the cutest little things one could imagine. Only a few days old and feeding industriously a hundred yards from cover, one wondered how they could escape the raven and the gull. A watchful parent might warn them, but even so, there was no place to hide. However, ravens were scarce and the plovers kept far away from the gull infested islands; and, as both babies and adults were plentiful, their scheme of life must have been successful.

We found no occupied nests and so can do little for ornithology beyond recording the fact that *Charadrius nivosus* does breed here, a long way from any place from

Fig. 26. NEST AND EGGS OF FRAZAR OYSTER-CATCHER; SCAMMONS, MAY 23, 1926.

Wright M. Pierce, photo.

which they have been reported before. But there is no reason why they should not occur plentifully both to the north and the south, and they probably do.

OYSTER-CATCHERS

Scammons Lagoon is a haven for oyster-catchers, or appears so to such of us as are accustomed to but an occasional pair scattered along the various islands and rocky projections in the more northerly Pacific Ocean. There are at least two or three hundred oyster-catchers fairly evenly distributed over the islands we visited, with an occasional pair or so on favorable mainland strands. When the tides are going down vast stretches of hard flats are exposed and become feeding grounds. The birds pursue the receding water even to the point of wading, and there they hunt the small marine life on which they live. When the tide turns they use the black levels as a lounging place until driven ashore by the sea. They are markedly indolent and slow in movement and, when undisturbed, never appear the least bit busy.

They climb up on the shell banks which are the back-stops of the beaches and there build their nests. The shall banks are usually a yard or two above high-water mark; they are flat and quite narrow and often have finger-like projections of fifty yards or so on the same level, running toward the east. Typically, all these higher flats are composed of nothing but shell, largely unbroken and of a size which may be judged in the accompanying illustration. Sand and small impurities have been garnered by the wind. The oyster-catcher likes to build her nest where she has an unobstructed view in all directions, securing to herself the opportunity of slipping off unobtrusively at the approach of an enemy. But she is a stupid bird and is easily satisfied with a make-shift which seems to her to accomplish her purpose, but in reality does not do so at all. So on some of the earthen islands we find her nesting on little mounds from which, it is true, she can see, but to only a matter of a few feet.

In the Gulf of California the favorite site for an oyster-catcher is the end of the rather long spits of cobble stones. These are so nearly level that a sitting bird has an unobstructed view for a hundred yards. There she builds a nest of fine hard material—small pebbles and bits of shell. And as she cannot have broken the larger stones that were originally on the site, she must have removed them. I use the analogy for Scammons. Instead of breaking the shells with her powerful bill she probably pulls them out of the way until she has a flat circle about ten inches across. This clearing she lines as neatly as tile work, and on them deposits her eggs, one, two, or three. The breeding season seems quite long, as we found both well developed young and fresh eggs. I have observed parents with their young long after the latter had taken wing and so feel sure that the oyster-catchers raise but one brood a year.

In trying to assign a name to these birds in Scammons I must confess that nothing I have read will fit the conditions I found. Ninety per cent of the oyster-catchers had white bellies, the rest had all their underparts black, with the exception of one whose belly was streaked black and white. Mr. Chester Lamb wrote me that on Natividad Island there was a much larger percentage of mixed underparts than we found. That there were two phases of one bird instead of two distinct species in the lagoon was apparent to anyone watching them. There was only one case I observed of a black bird paired with another black; all the other blacks had white-bellied mates. The difference between the birds was limited to the abdomens: place a mixed series in a row with the backs up and one could not tell one bird from the other. In their conduct, especially when their nests were threatened, there were no differences at all.

I feel perfectly safe in saying there were no Black Oyster-catchers (*Haematopus bachmani*) present. I have seen too many of them, from Monterey to Sitka, not to know by heart every movement they will make and every note they will utter when

one trespasses on their homesites. The actions and the cries, and especially the noise, are more unusual and more uniform than those of any bird with which I am acquainted. They fly customarily in a complete half circle from the rocks on one side to those on the other, the birds keeping near each other and almost always close to the water. The noise is incessant, shrill, continuous and loud beyond belief. The contrast with the birds in Scammons is striking. There, both the white and black bellied are almost as silent as plover and try to win safety by a prodigious show of indifference. There is little or no excitement while we tramp around the nesting sites. When the parents find we cannot be persuaded to follow them away they take up positions fifty to a hundred feet from us and there remain motionless, usually as long as we are in the neighborhood. There is another great difference between *H. bachmani* and the black phase in the south. The former is decidedly darker than the latter, especially on the back, whereas true *Haematopus frazari* from both ends of the Gulf appear to be the same as those in Scammons.

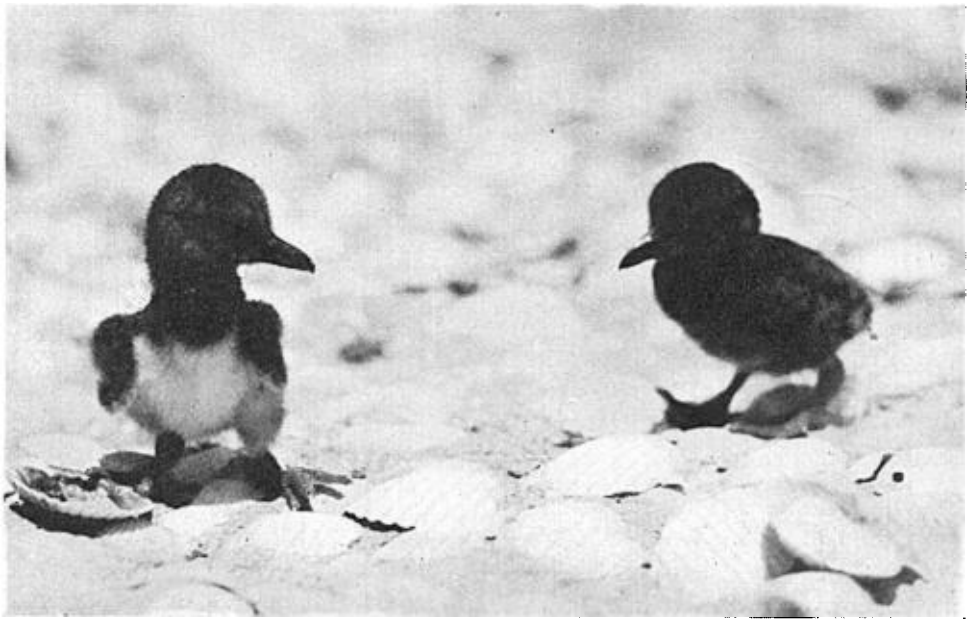

Fig. 27. TWO DOWNY OYSTER-CATCHERS, OF ONE BROOD, YET ONE WHITE-BELLIED, THE OTHER DARK-BELLIED. SCAMMONS, MAY 23, 1926.

We found and photographed a pair of downy young not over a few days old. These youngsters are obviously of the white and black types, respectively; we have the skins to show that there is no photographic illusion here. So we have very strong evidence that the black and the white phases do mate and do produce fertile offspring and that the young have partaken of the coloring, one of one parent and one of the other. These little birds are not mongrels, though we know from some adults that occasionally there are chicks which do inherit from both parents. Comparison shows that the white-breasted downy does not differ at all, at a cursory glance, from a baby taken on Coronado Island in the Gulf.

The introduction of other factors makes it a much more complicated task than appears on the surface to determine the precise status of the bird we found in Scammons. If there are intergrades, we have to give up the idea that the Black Oyster-

catcher is properly named; it should be *Haematopus palliatus bachmani.* That there are occasional hybrids is probable, for both species are notorious wanderers. We took a black at San Geronimo, which seems half-way in color between the "blacks" of Alaska and those of the lagoons. The birds with parti-colored bellies suggest intergrades, in as much as they are not true melanistic phases. But the backs of the birds with parti-colored bellies do not differ from those of any of the other lagoon or even Gulf oyster-catchers, and the characteristic differences in the length of the bill include all intermediate sizes and occur seemingly without regard to color.

My own conclusions from this medley is that the "black" has acquired protective coloration against the water swept rocks of the north, while the white belly of the *frazari* renders it less conspicuous on the sandy beaches where it lives. The change in natural background is quite abrupt. On the Pacific side of Baja California del Sud the condition we found at Scammons probably occurs with a constant lessening in the number of blacks as far as Cape San Lucas. Within the Gulf of California proper no "blacks" have been reported. I do not believe intergradation has as yet been established nor that the color or bill length of any individual bird is more than a matter of accident, their ancestry being always the same. *Frazari* is strongly the predominating type, due very likely to the gradual extinction of the black by survival. If this is correct, then in Scammons there is but one oyster-catcher, the Frazar.

Egg measurements follow, but I have not enough available material to make them of much value.

W. L. Dawson:	2.21 x 1.53
San Luis Islands:	2.20 x 1.56
Scammons:	2.22 x 1.53
"Blacks" from the north:	2.20 x 1.53

OSPREY

Apparently the Osprey breeds here and there all across North America and maintains a contact with his neighbors sufficiently intimate to prevent geographical isolation. The nesting instincts of the birds from the two coasts are so closely parallel that one would hesitate before considering the birds we found in Scammons as anything but *Pandion haliaetus carolinensis.* Apparently the first choice of the Osprey everywhere but in a wooded country is so to place her nest that she can see into it or from it, in every direction. As she seldom realizes this ideal, her next choice is a pinnacle of rock or the top of a ledge, or even the backbone of an island where she will have a three-way view at least. She shows a marked preference for scenery over inaccessibility and for islands rather than mainland. In a wooded country certain types of trees are her ideal. A throw-back of instinct, pregnant with meaning, is the eagerness with which she nests on the flat tops of oil derricks in a treeless and arid country as, for instance, at Santa Catarina Landing.

In Scammons she limits herself to the islands. Years before the memory of any of those who now travel these waters a great log drifted in and was dropped high and dry on one of these islands in the middle of the bay. Ever since, according to tradition that runs back fully a century, there has been a nest on it, kept up and occupied. Of the remaining dozen or more nests we found all had been built either on the beaches or else on the damp soil of the marshes. One even stood where the higher tides surrounded it to the depth of a foot or more. All were very large affairs, apparently being rebuilt and added to year after year. The tops are flattened without being cupped and while there is no lining in a strict sense of the word, there is enough extraneous material to give the upper part a level and solid surface. The nest photographed is typical of the others.

We brought home six young for the San Diego Zoo. Most of the other young were on the verge of flying, being a month or two later than the immature birds of San Luis. Unfortunately I am limited by a wise law and have not yet sufficient osprey eggs of western take to make comparisons of value.

RAVEN

As nothing we found in Scammons can shed light on the contradictory views of the status of the various races of the raven, I will merely record that we found some subspecies of *Corvus corax* nesting very sparingly on the earthern cliffs along the south shore. Their nests, as always when not in vegetation, are built under an overhang to

Fig. 28. OSPREY AND NEST, ON THE BEACH AT SCAMMONS, MAY 24, 1926.
Wright M. Pierce, copyrighted photo.

prevent the pebbles from rolling in, and the extremely thin shells are further protected by a deep and exquisitely fine lining. When we arrived, the young were already on the wing and so I am not sure that more than one pair breeds in the part of the lagoon that we visited.

We saw a raven going through a performance which the fishermen tell us is not at all unusual. The bird had a clam in his beak and was carrying it to a height of thirty feet or so, then dropping it. For many miles there was no rocky ground on which it would break, and so, when he lit beside and examined it, he could do no better than take it into the air and try again. We were travelling past him when we first noticed him, and he was still on the job when he disappeared from view. So, though I have few kindly words for ravens, I must add perseverance to undoubted cleverness.

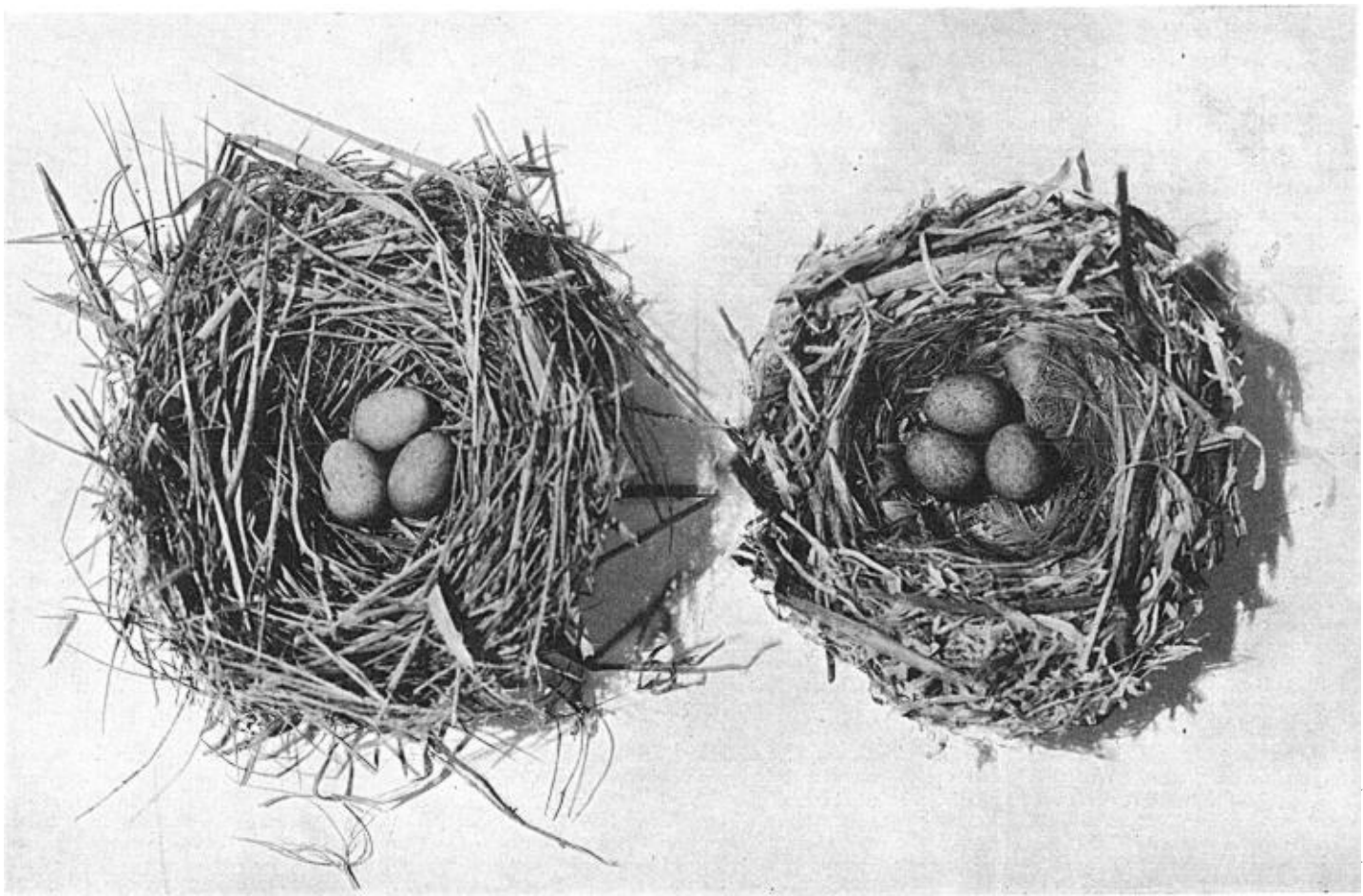

Fig. 29. NESTS AND EGGS OF THE LARGE-BILLED (AT LEFT) AND LAGUNA (AT RIGHT) MARSH SPARROWS.
Photo by the author.

MARSH SPARROW

This bird has had various names assigned it by different recent authorities, but all refer to the sparrow which breeds at Abreojos Point (*Passerculus halophilus*). The south channel of Scammons runs back until it is at no great distance from that Point, and we are perfectly safe in assuming that the birds which breed there are the same as those we took, especially as this identification has endorsement of the San Diego Natural History Society. How far down the coast these particular sparrows extend is still an open question; but their northern breeding limit, it seems certain, is coincident with that of the San Ignacio Area.

They are very common in the marshes, both insular and mainland, all over the lagoons. Their actions resemble closely those of the familiar Belding Marsh Sparrow (*Passerculus beldingi*) and the Large-billed Sparrow (*P. rostratus rostratus*). They are all busy little souls, forever making short flights to thick tufts of grass or branches of dead bushes, never paying much attention to us, yet not for an instant losing their keen perception of our presence. The always watchful eye permitted no close approach. It is not possible to estimate the number present beyond stating that they were fully as thick over suitable spots as are the Belding in Southern California similarly located. We were far too late for the breeding season, which must be at its height in April.

I have had the good fortune in the last two years to examine at least twenty nests each, in situ, most of them empty, sad to say, of the Belding Sparrow, which breeds freely at least as far as El Rosario, of the Lagoon Sparrow of Scammons, and of the Large-billed Sparrow below Portolabomba on the Colorado River. There are certain comparisons to be made between these nests that are of value—and of great value, because of unvarying constancy of special construction. Both of the Pacific Coast races build neat nests, so nearly alike as to be indistinguishable. They are nicely rounded and fairly well lined with slender leaves and feathers, but so poorly put together that with the least careless handling they fall to pieces. Ordinarily they are made of shreds of seaweed or leaves and some dead grass stems. Contrast this with *P. r. rostratus* which I have found only in living grass and whose nests are constructed from grass stems alone. They not only have no lining but there is not even as much as a thinning toward the inside.

The sites of the nests and the behavior of the birds are very similar as between the two northern races. *Rostratus* nests only in the long grass which is subject to tidal overflow and is to be found near the mouth of the Colorado River, a yard tall, Bermuda-like growth subject to a monthly wetting; while *beldingi,* in addition to the marshes, will nest in salicornia, often even coming onto dry land to do so. The Lagoon Sparrow (*halophilus*) does not care for anything moist. His first choice is a runt growth of salicornia just a few inches high. This is found not unfrequently in small patches where the tide moistens but does not overflow. Here the sparrow hides his home cleverly, utilizing to the utmost the cascades of weed growing over rough ground or small mounds. There was one very small island well back from the mouth of the lagoon that was fairly covered with cactus, a cholla-like growth supporting long drapings of grey moss. The birds played about in it as do the house finches at home; and they bred in it, too, sometimes as much as four feet above the ground, concealing their nests most carefully where the parasite was thickest. Nor are these sparrows averse to building on the dry alkali itself, sometimes a hundred yards from the water, but always artfully hiding under a spreading branch. I flushed three of the birds alto-

gether, within a yard of my feet; two had babies and one a nice fresh set of three eggs. In each case the bird gave the most convincing demonstration of the broken wing act I have ever witnessed.

I have far too few eggs to show any differences there might be in the three sparrows discussed. There are such wide-spread variations within each species that a very large series would be required to show even average differences. It is the psychological individualities of the three birds that is of chief importance. Mr. A. M. Ingersoll was accommodating enough to allow me to compare some nests of the Lagoon Sparrow with his extensive series of those of the Belding. The latter varied to a marked

Fig. 30. SUCH IS SCAMMONS: LOWER CALIFORNIA REDDISH EGRET OVER THE MARSH.
Wright M. Pierce, copyrighted photo.

degree, but at the same time had many characteristics which were always present. Into this series *halophilus* melted as perfectly as other nests of *beldingi* could have done. The striking difference of the nest of *rostratus,* however, shows that that bird must have inherited its nesting instinct through a very different line from that of either *halophilus* or *beldingi.* On the other hand, the close similarity between the nests of the latter two almost prove a specific relationship. Considering the migration routes of these birds, there seems to me to be no question that *halophilus* and *beldingi* should be considered subspecies of one species, and therefore the bird of Scammons should be named *Passerculus beldingi halophilus.*

San Diego, California, October 14, 1926.