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## CALIFORNIA GULL

### A Comparative Plumage Study\*

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In a recent article Brooks<sup>1</sup> described and illustrated the plumage changes of the California gull, *Larus californicus* Lawrence. His study was made from the observation of gulls in the field and from skins taken from birds under normal conditions.

Dwight<sup>2</sup> in his monumental work on the gulls of the world briefly describes the appearance of the first winter (non-nuptial) bird and second summer plumages. Dwight's second summer description is listed as, "first nuptial plumage" in his writings.

The following remarks on plumage are about the changes taking place in the first winter, and second summer birds, as observed in captivity by the author.

One of the specimens under study was hatched in an incubator and its exact age is known. All other birds used in this study were captured at Rock Island in Utah Lake, Utah. A large colony of California gulls breeds at this island and then migrates in late September and early October, to the Pacific Coast. The birds, with the exception of the incubated chick, were captured a few weeks before migration took place. All birds were in complete juvenal plumage.

The birds in captivity were fed hamburger once to twice a week. In addition, corn (cooked), vegetables of various kinds, and bread were added to the diet. The pen was 8x8 feet square and 5 feet high. A short screened runway was connected to the pen. The runway

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\* Contribution No. 105.

1 Brooks, Allan, 1943. The Status of the California Gull. Auk, Vol. 60, No. 1, pp. 15-20.

2 Dwight, Jonathan, 1925. The Gulls (Laridae) of the World. Bulletin American Museum of Natural History, Vol. 52, pp. 198-199.

was 10 feet long, 4 feet wide and 5 feet high. The birds were exposed to all changes of weather and thus were subject to the continual effect of outdoor conditions.

Under normal conditions, where the gulls are at their winter residence somewhere along the Pacific coast, marked changes in plumage are taking place. It seems that, in order to gain a complete story of plumage change in the California Gull, under natural conditions, after it has departed from its breeding grounds, it will be necessary to carefully study banded birds. In anticipation of this, banding of California Gulls has been done at Rock Island each spring since 1940.<sup>3&4</sup> However, in order to observe the plumage change even under abnormal conditions, birds kept in captivity were selected for study.

#### FIRST WINTER PLUMAGE

Dwight's<sup>5</sup> reference specimen is a bird collected November 11, 1912 at Pacific Grove, California. Brooks<sup>6</sup> does not list a winter bird as such in his description although he has an illustration of a 10-month-old specimen, collected April 26, 1923 at Buena Vista Lake, California. He calls this the "first spring plumage." Dwight's description is of a bird at the beginning stage of winter plumage while Brook's description is for the terminus of winter plumage.

In order to get the comparative colors and patterns for these two birds I quote from Dwight<sup>7</sup>:

Acquired by a partial post juvenal moult in September and October. Back paler and grayer than the juvenal, with less mottling, and the barring of a paler brown, more fused and diluted. Head dark and heavily streaked, a trifle paler than the juvenal. Underparts paler than the juvenal on chin, throat and breast. Wear brings into prominence the barrings and mottlings through loss of feather edgings, producing a spottiness. Wings and tail of juvenal plumage retained. Bill and other soft parts much like the juvenal.

Brooks<sup>8</sup> describes the characteristics of a ten-month-old bird as follows:

The drab gray black is replaced by blue-gray feathers only slightly duller than the mantle of the adult; the head and breast turn whiter but the primaries and rectrices are retained; the secondaries and tertials are usually very abraded, and the latter are reduced to filaments as the season progresses; the feet are turning from flesh to bluish.

3 Tanner, V. M., 1941. Gull Banding Notes on Utah Lake. Great Basin Naturalist, Vol. II, No. 2, pp. 98.

4 Tanner, V. M. and Beck, D. Elden, 1942. Gull Banding Notes on Utah Lake. Great Basin Naturalist, Vol. III, pp. 55-57.

5 Dwight, Jonathan. Ibid.

6 Brooks, Allan. Ibid.

7 Dwight, Jonathan. Ibid. p. 198.

8 Brooks, Allan. Ibid. p. 17.

In the study of the birds in captivity it was evident that both color and color pattern were undergoing change from month to month.

At the end of the eighth month (last of January) many changes have taken place in the detail of color and pattern in captive birds. In general the whole body color tone tends to be darker. This is distinctly seen in the wing region.

The primaries have lost the light colored tip seen in the juvenal and the whole feather vane is a deep brown to black color. The primary coverts are similar in color to the primary feathers but have a narrow, light colored, distal band. The greater, medial and lesser coverts are dark cinnamon to brownish with tawny to grayish borders.

The head, as viewed dorsally, is predominantly cinnamon with slate colored streaks subdued. The neck is primarily cinnamon color.

In the region of the axillaries and the back, the greatest change has taken place. The axillaries have a barred effect much subdued by a grey color. The pattern effect of the juvenal has changed from a barred effect to one of mottling in the month-old bird. Some of the feathers in the back and axillary region are a solid pearl-gray color.

The upper coverts are similar to the juvenal, but are more elongated. The pattern of the individual feather in the upper tail coverts is cinnamon while in the juvenal it is a deep brown to black.

The tail feather vanes are terminally tipped with white. Next to this is a dark band, brown to black in color. Next is a narrow white band. With the exception of the two outside feathers, the remaining part of the tail feather is solid black to deep brown. The two outside feathers are barred or mottled light and dark.

Viewed from the venter, the wings are slate-colored and almost a solid tone. The breast is darkly mottled and streaked a dull grey. Proceeding posteriorly and ventrally the color tends to become lighter. The under tail coverts are distally barred. The medial under tail coverts are as long as the medial tail feathers.

The ten-month-old gull in captivity varies from the eight-month-old bird in the following respects: The head (dorsally) is lighter in color but still predominantly brownish. Neck region almost a solid brown. (Examination of an individual feather shows the proximal part to be white and distal part solid brown). Anterior, dorsal feathers on back are slate color. Main region of back and upper tail coverts, barred and mottled a grey and deep brown. Anterior axillary feathers deep brown and faintly patterned. Throat region much lighter. In some specimens the throat region is almost white. Whole under body color is a lighter tone than in the eight-month-old gull.

## SECOND SUMMER

Dwight's<sup>9</sup> "first nuptial plumage" is the nearest description he gives to what I call the second summer plumage. His reference specimen is one taken at Big Stick Lake, Saskatchewan, Canada, July 18, 1906. His description is as follows:

Acquired by a partial prenuptial moult in March and April. Wings and tail of the juvenal plumage still retained. Back like the first winter, but rather paler and with diminished central areas on the new brown feathers, some grayish. Head much like the first winter but rather pale. Underparts rather paler than the first winter, the chin and throat largely white. Bill and other soft parts much like the juvenal.

Brooks<sup>10</sup> does not describe the plumage for the second summer bird in his discussion.

The birds in captivity, fourteen months of age, are lighter throughout the whole body color than any age previous. Although the general pattern may be retained in the wing region, the tone of color is decidedly lighter. Many feathers on the dorsum are solid grey. The median and lesser wing coverts have unevenly distributed cinnamon and pearl grey feathers. The bill at its terminus has a light colored tip with a broad black to deep brown band. The main region of the bill is cream to yellow. The eye is solid black.

In late summer (September) the color tone of the head and the neck region tends to become darker than that of the earlier months. The greater coverts are lighter and more uniform in color. The color tone is near that of the pearl grey mantle of the adult. The anterior feathers on the back are predominantly grey. Posterior feathers are light brown and grey mottled. The tail feathers are basally mottled dark and light, distal half being black. The outside tail feathers are pure white on the inner side of each vane except the tip which is black. The outer part of the vane is mottled its full length.

This brief comparative study can probably be summarized appropriately in two statements recently seen in two published accounts:

Bissonnette<sup>11</sup> speaking of photo periodicity as it affects pelts of animals says, "This all points to the necessity of using animals from one locality and similar in normal behavior for experimental studies of this sort, lest differences in normal behavior carry over into the experimental results."

<sup>9</sup> Dwight, Jonathan. *Ibid.* p. 199.

<sup>10</sup> Brooks, Allan. *Ibid.* p. 17.

<sup>11</sup> Bissonnette, 1943. Some Recent Studies on Photo Periodicity in Animals. *Transactions of the New York Academy of Science, Series II, Vol. 5, No. 3, p. 47.*