

ORNITHOLOGICAL OBSERVATIONS DURING THE TOTAL SOLAR ECLIPSE OF JANUARY, 1889.

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In the afternoon of January 1, 1889, occurred phenomena of such great importance to astronomers that they took every precaution to secure valuable observations and data from various localities. Most of these results have already been published, but as yet I have heard nothing from ornithologists who apparently failed to improve the opportunity for observing the effect upon birds of the sudden obscuring of the sun.

Some years ago a partial eclipse of the sun occurred soon after rising, and although I went some miles on foot to a favorable locality near Oakland, Cal., and noted the activity, songs, etc., of the birds for two hours, I was unable to connect any of these events with the eclipse, which was so slight, that I doubt if the birds were at all conscious of anything unusual.

Had I anticipated anything so wonderful as the total eclipse proved to be, I should have endeavored to stimulate observers to take the field and have suggested a schedule upon which to record correlative phenomena during the afternoon. With such material a generalization might have been made developing new facts. As it is I can but give the notes which I made at Healdsburg, Sonoma county, at which place the eclipse was total for about fifty seconds, and I believe the line of totality extended for some eight miles beyond.

My observations were made while photographing phases of the eclipse in a vineyard about one hundred yards from large, leafless white oaks, and two hundred yards from a grove of madroño. The location was quite favorable, being upon high ground between Russian River and Dry Creek, and fairly swarming with birds, principally robins, whose medley of calls and songs rivaled the confusion in a bird-store.

Not having any one to call time for me the seconds were not taken, nor are they important in this connection. Observations were recorded every five minutes after 1:20, some time before any noticeable effects upon the birds were seen, and half an hour before totality; also, for half an hour following totality, which occurred at Healdsburg about 1:50.

The first contact was at 12 h. 25 m. 23 s., about one hour previous to my note-taking. Weather, sunny, calm and fairly clear.

1:20—Robins (*Merula migratoria propinqua*) were scattered about the vineyard feeding upon dry grapes left upon the vines, or collected in the leafless oak trees, singing loudly in confusion with a flock of blackbirds (*Scolecophagus cyanocephalus* and *Agelaius gubernator*).

1:25—No difference in the behavior of the above mentioned birds, whose abundance and noisyness were closely watched throughout. A few Audubon's warblers (*Dendroica auduboni*) were seen feeding in the vineyard.

1:30—There was a momentary lull in the medley of bird notes due, I believe, to a change in position of some of the robins and blackbirds, for the songs at once recommenced after they had alighted.

1:35—Most of the robins had ceased singing, but continued their startled calls; the notes of the blackbirds became quieter.

1:40—The robins became very restless, frequently calling, but not one singing; the blackbirds, too, were uneasy, and almost wholly silent. It was now getting very dark, and stars were visible. A few ground squirrels (*Spermophilus grammurus douglassi*) were out from their holes, and one that had his cheek-pouches crowded full of corn, stood bewildered near his hole until I came within ten feet of him. This species is usually very shy, so much so that it is often difficult to shoot them over open ground, yet here was an individual that did not seem to realize that I was so close, for his entire demeanor was fearless.

1:45—The blackbirds took wing and circled in a close flock about the trees; but few sounds were uttered by the robins.

1:50—At this time I recorded the sudden disappearance of all sun rays. The actual time may have differed two minutes, more or less. The sudden totality was accompanied by an awful stillness. The trees were full of birds, but not a sound was heard except a faint chirp from a goldfinch (*Spinus*) flying overhead, and suggestive of a bird migrating at night. The sky had a peculiar greenish color, and well may have caused terror among the birds.

During this period I was told by some neighbors that their chickens had gone to roost. Those which I observed appeared to be too suddenly overcome by the change, and did not go to roost, but huddled together close to the sides of buildings and fences.

A cow in a pasture near by came to the gate and lowed, as was her habit at milking-time, four hours later.

1:55—The first sunbeams were welcomed by the chirps of Audubon's warbler, then the notes, but not songs, of robins, and a sudden disturbance in the tree-tops as the apparently alarmed birds broke out in slight notes of their calls.

2:00—The metallic notes of the ruby-crowned wren (*Regulus calendula*) were heard, and increased noise from the robins.

2:05—A flock of eight mourning doves (*Zenaidura macroura*) flew past. The birds acted very much as on dark, cloudy days, but did not seem to be feeding. The cow returned to pasture.

2:10—Blackbirds were observed feeding.

2:15—The sun was about half obscured; nothing unusual could be detected in the behavior of the birds unless that they did not recommence their songs.

2:20—Vigorous crowing of roosters and increased screaming of robins.

2:25—A light breeze sprang up, and a normal condition of life among the birds was noticed, all again feeding and calling, but the songs had ended for the day with the exception of a few robins which sang in the oaks.

Summing up the general behavior of the birds during the event, the peculiarities which cannot well be defined in writing, were all, it seemed, due to a sense of terror from circumstances which were appalling inasmuch as they were unknown and unexpected.

In the Sacramento valley, I am told, the wild geese which were in flocks of hundreds were very noisy previous to the **eclipse**, but when darkness came on they became quieter, and many took wing, probably to the night resting grounds.

Since this paper was written I have received a letter from Mr. Chas. A. Keeler of Berkeley who was at San Rafael, Marin county, on the day of the **eclipse**. At that place it was not total, but his observations seem to coincide with mine, that the actions of the birds were caused by fright. He writes: "Until the **eclipse** neared totality the birds acted in a perfectly normal manner. When nearly total all bird notes were hushed. The sharp metallic note of the California brown towhee (*Pipilo fuscus crissalis*) was no longer heard, and the same was the case with the Arkansas goldfinch (*Spinus psaltria*) which was also common. A number of Anna's

humming-birds (*Trochilus anna*), however, acted quite differently. When the **eclipse** was fullest they flew about near some gum trees uttering a sharp, loud note of alarm somewhat different from anything I ever heard from them. When the sky grew brighter their manner again became normal.”



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