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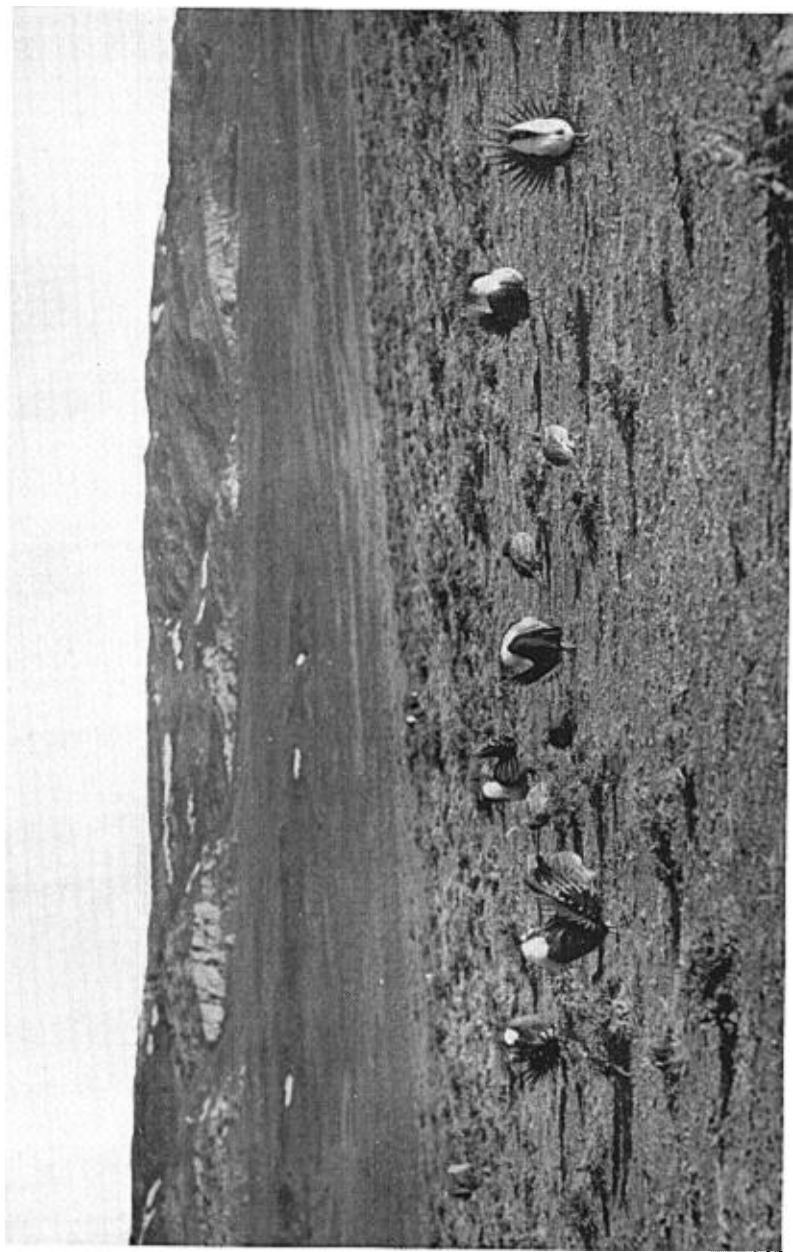
MATING PERFORMANCE OF THE SAGE GROUSE

BY JAMES R. SIMON

Plates 8, 9

THE Sage Grouse (*Centrocercus urophasianus*), once abundant over the sage-brush plains of Wyoming and other parts of the West, has unfortunately become so rare that in 1937 the Wyoming Game and Fish Commission closed the hunting season and has not reopened it. Although a closed season and added protection against poaching have been responsible for an increase in the numbers of this valuable bird, it was soon evident that protection under the game law alone would not be sufficient. To facilitate an increase in distribution of the grouse, the Wyoming Game and Fish Department initiated a project to trap birds and transfer them to all suitable habitats within the State. The diminishing numbers evoked general interest in the habits of the Sage Grouse and special interest in the biology of the bird, particularly in the strutting and mating activities.

Since the mating act has been so infrequently observed and so inaccurately reported, facts concerning the manner in which the egg of the Sage Grouse is fertilized have become obscured by legend. Many people of long residence in the State claim to have seen the Sage Cock eject seminal fluid on the ground, and further claim to have seen the Sage Hen actually eat it. Other means of 'external fertilization' have also been described. Amusing as these stories are, they show a general lack of knowledge of the biology of Wyoming's most important native gamebird. The same 'old timers' who swear to such observations admit that the Sage Grouse is anatomically similar to the Domestic Fowl. Likely the myths are based on the fact that strutting cocks frequently tread a pile of earth as if copulating, and the fact that at the same time hens are feeding on the strutting grounds. To date the author has learned of no other ob-



SAGE GROUSE ON STRUTTING GROUND

server who has reported the actual mating of Sage Grouse. Girard (1937) did not observe mating nor did Bailey and Niedrach (1939) report having seen coition, in their article in the 'Rocky Mountain Sportsman.'

Our observations were made in the early mornings of April 5, 6, 7 and 8, 1940, near Skully Point, about eleven miles south of Kemmerer, Wyoming. A blind was constructed near a spot long known to be a strutting ground, but the blind proved to be impracticable. Each morning a car was driven to the edge of the parade ground; lights were off and occupants were quiet by five o'clock. Although it was before dawn, Sage Grouse cocks were already present on the grounds and the courtship display was in full progress; the presence of the car did not interfere with the activities of the grouse; in fact, it served as a perfect 'blind' and the birds approached it quite casually; all observations were made and all pictures were taken from the car. Hens could not be observed before daybreak because, if present, they offered no contrast to the dark background as did the white neck- and breast-feathers over the expanded air pouches of the cocks. However, soon after five o'clock a few hens were seen to arrive and to alight in the midst of the cocks; as dawn came, other hens could be seen walking toward a point centrally located on the strutting grounds.

About three hundred cocks and eighty hens were present in an area approximately one-quarter mile long and two hundred yards wide; this area extended along the top of a gentle slope covered with a stunted growth of sagebrush (Plate 8). Cocks were evenly distributed throughout the whole area except where there was a concentration on a bare spot, perhaps 100 by 200 yards in size. Cocks usually remained at some distance (twenty-five to forty feet) from each other as if each had chosen his own plot of ground; rarely four or five cocks surrounded a group of hens; or there were occasional sparring matches. When the cocks left their positions to engage their nearest rivals, they often ran rapidly a distance of twenty-five feet with their tail-feathers spread fanwise and uttered a clucking noise. The attacked cock sometimes met the charge with beating wings; sometimes he stepped straight backward a few feet, faced the attacker, then advanced himself as opportunity offered. Occasionally the attacked cock retreated with his full side presented to the attacker; to do this, he stepped sidewise rapidly; rarely was the attacked cock seen to retreat with his back to the aggressor. Often the aggressor was soundly beaten, usually after a few seconds of fighting. After fighting, cocks stood side to side, facing in opposite directions about two

feet apart (Pl. 9, fig. 1) and uttered a rapid clucking noise (*kek, kek, kek*); at this time their tails were folded and air sacs deflated. Fighting between the males consisted mostly of wing-beating; there was some pecking and seizing with the bills but no jumping or spurring.

Hens moved around the grounds freely and on four occasions were seen to bunch together in groups of six, six, eight, and thirty-two. Around these groups and seeming to keep them together were four to ten cocks. The thirty-two hens were seen in a compact group scarcely covering an area ten feet by ten feet.

Cocks were observed at their courtship performances from five to eight o'clock each morning. There was some activity before five and after eight but not nearly so great as between these hours. The white-breasted strutting cocks were a most impressive sight. They seemed to confine their strutting to small areas (five feet in diameter, approximately). The whole strut was as follows: the quiet cock spread his tail-feathers while he raised and spread the wings slightly and raised the long black plumes of the back of the neck. The large air sacs which lie under most of the neck and breast skin were inflated so that the bare bulbs of yellowish breast skin showed (Pl. 9, fig. 2); the cock then walked a few steps forward in a semicircle, stopped with head high, tossed his head and inflated breast forward and upward three times. During this action the head was almost entirely mantled by the breast- and neck-feathers (Pl. 9, fig. 3). Partial deflation of the balloon-like air sacs was accompanied by a long loud plopping and bumping noise. A softer burbling sound could be heard as the air sacs were further deflated. When the air sacs were filled, the movement of the short and stiff breast-feathers over the under side of the primary feathers of the wings caused a rasping or twanging noise. Bond (1900) and Forbush (1917) state that the Sage Cock will lower the breast to the ground and push it along, thus accounting for the shortened feathers. This action was not observed, although the author was watching for it. Horsfall (1932) states: "At no time during the strut did the birds slide about upon their distended pouches." Usually after the air sacs were filled the cock walked about five feet, then stood quietly for a few seconds with tail spread and the skin of the breast sagging deeply, like a white apron (Pl. 9, fig. 4); then he repeated the strut—maybe five or six times—after which came an interval of rest. When not performing, the cocks stood quietly with tails folded and air sacs deflated so that the bare breast-skin did not show. Most of the cocks on the parade grounds did no breeding but continued to perform without

going close to the hens. They seemed disinterested in the hens; however, when a hen crossed the strutting area of a particular cock, though she was given no actual attention, she seemed to be responsible for an increased vigor in the strut, or, if the cock were quiet at the time of a hen's passing, he immediately started to strut.

No breeding was observed until daybreak and it was soon after daybreak when breeding was most common on the grounds. Hens, though not numerous, were continually moving to and from the parade grounds in all directions unless they were gathered in groups, when they uttered sounds similar to those of the Turkey hen. In some groups aggressive females were seen to drive other females away. Eight actual matings were observed on April 5 in the group of thirty-two mentioned above, and six matings on April 6 in the group of eight, all in full daylight and all within a distance of 100 feet from the observer—some within thirty-five feet. No breeding was seen April 7 and the strutting was lessened also, probably due to snow flurries. April 8, ten matings were observed. Motion pictures (16-mm. kodachrome) of the complete strutting and mating activities were obtained by the author; these are the property of the Wyoming Game and Fish Commission and were used to supplement field observations in compiling the descriptions.

Coiton seemed to occur only on invitation from the female and took place only when a hen squatted in front of a male with her wings slightly outspread and touching the ground. There seemed to be no actual pursuit of female by male. Cocks in strutting paid very little attention to hens which, when grouped, stood by motionless unless ready to be covered. If the hen were not ready, and, if a cock came close in the ordinary course of his strut, the hen jumped aside or ran ahead a few feet. On rare occasions a hen might be ignored by a cock even though she placed herself directly in his path and seemed to invite contact as indicated by outspread wings and the slightly squatting position. The cock usually covered the hen from six to twelve seconds (Pl. 9, figs. 5, 6). Of five cocks surrounding eight hens, one cock was seen to mate with three different hens, while the other four cocks did no breeding. On being released the hen darted away quickly for a few feet then shook and ruffled her feathers vigorously while the cock resumed his strutting. Activity, barring mating, was repeated in the late afternoon. Occasionally a cock which was covering a hen was attacked by one, two, or three of the other cocks in the immediate vicinity as if mating were a cause for attack. Most birds had left the parade grounds by eight o'clock,



FIG. 1



FIG. 2



FIG. 3



FIG. 4



FIG. 5

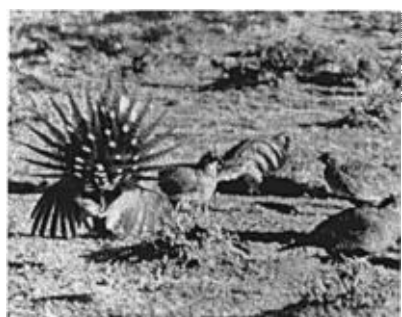


FIG. 6

MATING BEHAVIOR OF SAGE GROUSE

females first, then males. They flew in all directions. At all hours of the day and night in the vicinity of the parade grounds there could be found a few cocks which continued strutting.

Except for non-pursuit of the female by male, the breeding of Sage Grouse seems to be in most respects, the same as in the Domestic Turkey. The Sage Cock unlike the domestic rooster does not use his bill to hold the head or neck of the female.

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