

The two following returns after an interval of one and two years are of interest:

A544999	July 11, 1933	Glenn Berner	Recaptured at same den August 1, 1934	Jamestown, North Dakota
A515497	June 29, 1931	J. F. Brenckle	Found dead in same field August, 1933	Northville, South Dakota

The following recoveries were trapped or shot after their spring arrival in the North:

A544070	July 10, 1932	J. F. Brenckle	Shot April 24, 1934	Near Columbia, South Dakota
A568858	June 25, 1933	J. F. Brenckle	Trapped and released April 29, 1934	McVille, North Dakota
A568829	June 24, 1933	J. F. Brenckle	Trapped and released April 12, 1934	Kamrar, Iowa

Northville, South Dakota.

## NIGHT LIGHTING WITH BOB-WHITE

(*Colinus virginianus virginianus*)<sup>1</sup>

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AN extension of experiments on the modification of sexual cycles in starlings, ferrets, and pheasants, previously reported (Bissonnette, 1933, 1935, 1936a, b; Bissonnette and Csech, 1936a, b) was carried out with Quail (*Bob-white*, *Colinus virginianus virginianus*) to ascertain whether or not their sexual or breeding period could be moved forward into the earlier spring months by increasing the daily periods during which they were exposed to light in winter and early spring. Tests were also made of the fertility and hatchability of the eggs so produced, and of the number of eggs that might be obtained from a single female under these conditions. Pheasants had shown remarkable susceptibility to induction of early laying by alteration of the seasonal cycle of daily period of illumination coupled with a great increase in the number of eggs laid by females under experimental treatment (Bissonnette and Csech, 1936b). Over 103 eggs each were laid by three hen Pheasants between January 15 and June 29, 1936, and two of these hens were still laying intermittently at that time.

Controls consisted of several pairs of Quail of the Wisconsin strain of this species at the Shady Swamp Sanctuary, Farmington, Con-

<sup>1</sup>Aided by grants from the National Research Council, Committee for Research in problems of Sex, 1935-6, and the cooperation of the Connecticut State Department of Fish and Game. Mr. Earl E. Bailey, Trinity College, assisted with the electrical arrangements.

necticut, housed and fed in the routine manner in operation at the breeding grounds there.

A single pair of these birds was confined in a pen similar to those used for the Pheasants (Bissonnette and Csech, 1936b) and lighted in the same way. The light from the 60-watt bulb used illuminated the whole pen whenever it was turned on. This was done by an electric time switch after nightfall for three hours per night from December 16th to 26th; for four hours till January 6th; and for five hours per night thereafter. Birds were fed and tended in the same manner as the controls. Both experimental animals and controls were exposed to daylight each day normal for the season.

No changes of plumage nor of head furnishings were noted in the experimental birds before laying began. So such criteria of the effectiveness of the increased lighting upon the sexual cycle as occurred in the male Pheasant were lacking.

The experimental bird began to lay on March 22d, and continued till May 20th, during which time she laid twenty eggs at rather irregular intervals. Of the first seven eggs laid, two hatched out at a day or more over the usual incubation period. Of the next nine set, six were fertile and four hatched. The hen died on June 19th from unknown cause. She had laid 38 eggs the previous season under normal seasonal conditions.

Controls began to lay about the usual time, on May 19th.

It is therefore evident that the laying season of this strain of Quail in this locality is conditioned to some degree by relative length of day and that early laying of fertile, hatchable eggs may be induced by prolonging the periods of exposure to light in winter and early spring. Sexual activity of both sexes is therefore controllable with the technique described, though not to such a marked degree as is that of Pheasants. Increased egg production was not induced in the single hen used in this experiment as it was with the Pheasants. This phase of the problem requires further study in view of the premature death of the hen involved.

#### SUMMARY

Increasing the daily period of exposure to light between December 16th and June 19th up to five hours per night with electric light from a 60-watt bulb induced a pair of Quail to begin to lay fertile hatchable eggs from March 22d onward. Controls began to lay at the usual time on May 19th. Total egg production was not increased as it was with Pheasants, but the hen died prematurely on June 19th. This method may be used to obtain early chicks from Quail for restocking depleted game preserves.

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### GENERAL NOTES

**Some Land Bird Recoveries from Mexico.**—While selecting records for inclusion in the paper on returns of water birds from Latin America which appears elsewhere in this number, a few cases of recovery in Mexico of land birds came to attention. It is believed that none of these have previously appeared in print and accordingly, they are here given in detail for the benefit of those interested.

Mourning Dove. *Zenaidura macroura*.—An adult bird (B267045) banded at Lakin, Kansas, on June 21, 1933, by Preston F. Osborn, killed at Pénjamo, Guanajuato November 13, 1933.

Tree Swallow. *Iridoprocne bicolor*.—A fledgling (L48034), banded at the O. L. Austin Ornithological Station, North Eastham, Cape Cod, Massachusetts, on June 16, 1935, was reported by U. S. Ambassador Josephus Daniels as recovered at San Geronimito, Municipality of Palizada, Campeche, on March 16, 1936.

Yellow-headed Blackbird. *Xanthocephalus xanthocephalus*.—A juvenile bird (A292940), banded at Great Falls, Montana, on June 7, 1932, by Vernon L. Marsh, was found dead at Camargo, Chihuahua, on March 1, 1935.

Black-throated Green Warbler. *Dendroica virens*.—An immature bird (34-75026), banded at Overbrook, Philadelphia, on October 4, 1934, by Henry P. Bailey, was shot by an Indian at Tetela, Oaxaca, about April 1, 1936. This record also was reported by Ambassador Daniels.

Clay-colored Sparrow. *Spizella pallida*.—An adult bird (L53083), banded at Northville, South Dakota, on May 2, 1934, by J. F. Brenckle, was found dead on December 23, 1934, at Cuautla, Jalisco.

White-crowned Sparrow. *Zonotrichia leucophrys*.—An adult (34-112582), banded at Jamestown, North Dakota, on May 8, 1934, by Charles C. Boardman, was captured at Rancho Nuevo, Coahuila, about March 25, 1935.—FREDERICK C. LINCOLN, Biological Survey, Washington, D. C.

**Further Evidence on Blue Jay Migration.**—In view of recent discussions on the migratory activities of the Northern Blue Jay (*Cyanocitta c. cristata*) and the now common belief that a north-and-south movement of this species takes place in spring and fall, the present record is offered as affirmative evidence on that point.

A Northern Blue Jay—obviously a bird of the year—captured August 31, 1927, in a Government sparrow-trap located on my lawn in Iowa City, Iowa, was banded as No. 522155. On January 7, 1928, a little more than four months later, this bird was found dead at Hot Springs, Arkansas, by J. M. Caldwell. The point of recovery is approximately 475 miles, air-line, almost due south of the point of banding. The distance seems to be too great to allocate this individual in the category of a "casual" at Hot Springs.

Taken in conjunction with the five records cited by Dr. T. S. Roberts (*The Birds of Minnesota*, II, 62, 1932) of Blue Jays banded at Minneapolis, Minnesota, and recovered in the States of Missouri, Arkansas, and Texas, the record here pre-