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**Light Regulation of Sexual Activity in the Male Sparrow
(*Passer domesticus*).***

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The importance of light as a regulating factor of the sexual cycle in birds has been demonstrated by Rowan¹ (junco), Bissonnette² (European starling), Miyazaki³ (*Zosterops palpebrosa*) and Kirschbaum⁴ (English sparrow). These investigators have observed a precocious development of the testes following daily increases in the period of illumination. Such experiments were usually carried out during the early winter. The present author has undertaken to determine whether lengthened daily periods are equally effective at a time further removed from the normal breeding season. In this paper, a group of male sparrows, exposed to additional light beginning November 18th, is compared with another group first exposed on September 30th.

The November group of sparrows had been in the laboratory 16 days previous to the artificial lengthening of the days and all possessed the horn-brown bill of the sexually quiescent period. The birds received 4½ additional hours of light, daily, from a 100-watt incandescent bulb throughout the experiment, increasing the day to a total of about 14 hours. The effect of such treatment both on bill color and testis is shown in Table I.

The acceleration of testicular development which was observed in the birds of this group is in full agreement with the results of the aforementioned authors.

A second group of male sparrows, however, (Table II) first subjected to a lengthened light period on September 30th, gave a decidedly different result. These birds had been in the laboratory 10 days prior to experimental use. The light period was extended 2 hours the first day, 3 hours the second and from this time on 15 additional minutes daily until, after 14 days, the period had been increased 6½ hours, making a total of approximately 17 hours

* Aided by a grant from the Committee for Research in Problems of Sex of the National Research Council; grant administered by Prof. Emil Witschi.

¹ Rowan, W., *The Riddle of Migration*, Baltimore, 1931.

² Bissonnette, T. H., *J. Exp. Zool.*, 1931, **58**, 281.

³ Miyazaki, H., *Sci. Rep. Tohoku Imp. Univ.*, IV, 1934, **9**, 183.

⁴ Kirschbaum, A., *Anat. Rec.*, 1933, **57**, Supp., 62.

TABLE I.
Effect of Increased Light Periods on Sparrows, Starting November 18, 1934.

Bird	Bill color after			Final size of L. testis, mm.	Final condition of testes
	17 days	26 days	41 days		
	Experimental Group				
Y-1	I	Bird died		1.3 x 1.0	Quiescent spermatogonia
Y-2	I	II	III	7.0 x 6.0	Mature spermatozoa
Y-3	I	II	III	6.9 x 5.0	" "
Y-4	I	II	III	7.2 x 6.0	" "
Y-5	I	II	III	6.9 x 5.2	" "
Y-6	I	I	II	5.0 x 4.0	Few spermatozoa
	Control Group				
YC-1	Killed at start of experiment			1.2 x 1.0	Quiescent spermatogonia
YC-2	"	"	"	1.5 x 1.1	" "
YC-3	0	0	0	1.2 x 0.9	" "
YC-4	0	0	0	1.9 x 1.4	" "
YC-5	0	0	0	1.3 x 1.1	" "

0, no change; I, darkened brown; II, light blue; III, dark blue (Witschi⁵).

TABLE II.
Effect of Increased Light Periods on Sparrows, Starting September 30, 1935.

Bird No.	L. testis before exposure, mm.	Days of exposure	L. testis after exposure, mm.	Final bill color	Final condition of testes
80	2.0 x 1.5	18	2.0 x 1.7	0	Quiescent spermatogonia
70	2.2 x 1.2	18	1.5 x 1.2	0	Slight degeneration
77	2.4 x 1.7	39	2.6 x 2.0	0	Quiescent spermatogonia
97	—	39	1.0 x 0.6	0	" "
74	1.4 x 1.0	50	1.8 x 1.1	0	" "
98J	1.0 x 0.7	23	4.6 x 3.2	I	Spermatocytes
78J	1.9 x 1.4	23	7.7 x 5.0	II	Spermatozoa
65J	1.2 x 0.9	39	6.8 x 5.0	III	"

J, juvenile males; 0, light brown; I, darkened brown; II, light blue; III, dark blue.

of light. The size of the testis was measured during an exploratory laparotomy 8 days before the beginning of experimental exposure to light.

Of especial interest in Table II is the marked response of juvenile birds as compared with almost total lack of reactions in adult males which had previously passed through a breeding cycle. In the case of juvenile bird 78J, the lumina of the seminiferous tubules were lined with mature spermatozoa as early as 23 days after the beginning of light stimulation.

These results limit somewhat the importance of the light as a regulator of the yearly sex cycle in birds. In adult male sparrows an intrinsic sexual rhythm seems to be established which, through environmental factors, merely becomes synchronized with the seasons.

⁵ Witschi, E., PROC. SOC. EXP. BIOL. AND MED., 1936, **33**, 484.