increase in mitotic figures, a slight but definite softening of colloid, and an increase in the size of the acinus cells. However, this effect is not as marked as that produced by iodine, inasmuch as with the latter the average number of mitoses is about 5 times greater than that in the animals treated with NaBr.

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Action of Theelin on the Domestic Fowl.

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Juhn and Gustavson[1] have demonstrated the effectiveness of extracts of human and pig placentae, and human pregnancy urine in altering to the female type the new-growing feathers of Brown Leghorn cocks and capons. These authors have also pointed out a positive oviduct response to the same extracts in the immature female.

The present paper reports some effects of the injection of the crystalline female hormone, theelin, into the ovariectomized Brown Leghorn fowl. The writer wishes to acknowledge his indebtedness to Dr. E. A. Doisy and the Department of Biochemistry of this university for helpful suggestions and for bio-assay of material, and to the Department of Pathology for the preparation of tissues for microscopic examination. Full credit and thanks are due also to Parke-Davis and Co. for their very generous supply of theelin. The birds used were pure-bred Brown Leghorn stock, ovariectomized at 3 months of age, and examined periodically thereafter for weight, plumage, comb, and other changes. Autopsy was done on all, with special gross and microscopic attention to gonads and accessory sex characters.

Recalling the work of Domm,[2] the female fowl after a successful ovariectomy assumes the male type of feathering, spurs, and head furnishings, the latter being contingent upon the development of a compensatory testis-like gonad on the right side. The following results present some of the effects of theelin when injected under these conditions:

[1] Juhn and Gustavson. *J. Exp. Zool.*, 1930, **56**, No. 1.

[2] Domm, L. V., *J. Exp. Zool.*, 1927, **48**, No. 1.

Twenty-two birds were subjected to 5 experimental procedures: a qualitative and a quantitative test of the effectiveness of an olive oil solution subcutaneously injected, a test of a saline solution, a more prolonged injection of oil solution, and finally an injection of saline solution in divided doses.

Results. Injection of an olive oil solution of theelin in a dosage as low as 20 rat units daily is sufficient to cause a change of new-growing feathers from male back to female type, as Juhn and Gastavson described for the capon. Alternate bands may be produced in these feathers by alternating injection periods with non-injection periods. A saline solution of theelin in similar dosage is without effect in altering this feather reaction. A dosage of 150 rat units per day, given as 3 injections per day (one every 8 hours) is barely sufficient to change the color of the mid-portion of the feather back to female type. With more prolonged injection (3 weeks) of the oil solution, no change in head furnishings was noted, but autopsy revealed a decided stimulation of oviducts, which average 6 times those of controls in weight, and show gland and muscle development.

Conclusions. 1. The crystalline product, theelin, is quite effective in restoring to female type those secondary sex characters which have been altered by ovariectomy—namely, feathers and oviduct. 2. With 3 weeks' injection, theelin does not interfere with the stimulus to comb-growth afforded by the compensatory right gonad in this species. 3. Olive oil solution is far more effective in producing these results in the fowl than is saline solution, possibly because of the too rapid absorption and elimination of the saline solution.

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Comparison of Ciliary Activity under In Vitro and In Vivo Conditions.*

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Normal ciliated epithelia removed from the animal body and kept under optimal conditions vibrate vigorously for long periods of time.

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