TABLE I.
Effect of Intrasplenic Testis Transplants Upon Comb Growth.

	Age 36 days				Age 46 days		
	Control	S I	S II	S 89	Control	S I	S II
Avg body wt	369.0	354.0	345.2	275.9	513.2	503.4	486.0
Avg comb factor units	371.6	251.9	232.2	111.4	839.4	506.3	435.1
Avg comb factor units per g wt	0.995	0.697*	0.671*	0.396*	1.587	0.983*	0.908*
No. in group	16	15	14	12	16	15	14

* T value is significant at 1%. (Snedecor, George W., *Statistical Methods*, The Iowa State Press, Ames, Iowa, 4th ed., 1946.)
S I: chicks caponized at 5 or 7 days of age.
S II: chicks caponized at 20 or 21 days of age.
S 89: chicks caponized at 5 days of age.

by the number of comb factor units, and of that which passed through the liver of the spleen-graft chicks may be seen from Table I. Complete inactivation did not occur, as shown by comparison of series I and II with the chicks of series 89 (caponized controls), which were operated on at 5 days of age and otherwise given similar treatment. It is also seen that the number of c.f.u./g body weight in series I is larger than that in series II. This is explained by the fact that the transplants in series I had a longer time to grow and secrete than did those of series II grafted 2 weeks later. This explanation is supported by the fact that the difference in number of c.f.u./g body weight for series I and II at 46 days (7.6%) is greater than that at 36 days (3.7%). The comparison at 36 days shows that enough hormone had passed the liver to augment comb growth by at least 40.9%.

The fact that in other animals incomplete inactivation of endogenous hormone has not been reported under these conditions suggests either that inactivation is different in the chick or that the chick permits the detection of this minute quantity of hormone. The comb shows a progressive cumulative change which makes possible the measurement of a slight failure of inactivation occurring over an extended period of time. Although at sacrifice some testicular material was found in the normal testis location in a few birds, the data indicate that its effect was insignificant.

Summary. These data show that: (1) the testis hormone is partially removed from the circulation by the liver of the chick, and that (2) the comb gives a sensitive indication of the extent of hepatic inactivation of androgens. This may justify speculation that some androgenic activity may be retained by the products of hepatic metabolism.

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Excretion of Adrenal Corticoids in the Sweat.

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In experiments on the urinary excretion of adrenal corticoids in strenuous exercise it was noted that, with the onset of hot weather, the excess steroid excretion in the urine was strikingly reduced. It occurred to us that this might be due to the excretion of steroids in the sweat and the following study was carried out.

Two healthy adult subjects ran on a motor-driven treadmill at speeds of 8 to 12 miles per hour and a grade of 10% for periods of 30 to 45 minutes. The running was interrup-

ted every 2 or 3 minutes for a brief rest period. The room temperature ranged from 80 to 90°F., and the relative humidity from 60 to 90%. The total amount of sweat produced during an experiment varied from 550 to 700 g as estimated from the loss in body weight. Sweat was collected by allowing it to drip from the elbows into large funnels which drained into graduated cylinders. Contamination of the sweat by cellular debris was minimized by vigorous scrubbing of the arms before the experiment. When 50 ml of sweat was collected it was filtered and analyzed for adrenal corticoids by the method of Heard *et al.*[1,2] According to these authors, the method measures reducing steroids of the adrenal cortical hormone class, containing a primary or secondary (but not tertiary) α-ketol function, an $\alpha\beta$-unsaturated 3-ketone group, or both. The adrenal cortex is considered by them to be the major source of these steroids.

TABLE I.
Excretion of Adrenal Corticoids in the Sweat.

Subject	Adrenal corticoid concentration (γ per 100 ml)	
	Exercise sweat	Thermal sweat
J.N.	80	72
,,	76	64
,,	76	40
,,	80	52
,,	44	60
,,	46	
,,	40	
,,	56	
,,	40	
,,	40	
W.P.	48	
,,	60	
,,	64	
,,	46	
,,	50	
Mean	56.4	57.6

In another series of experiments, the concentration of adrenal corticoids in thermally-induced sweat was determined; this sweating was induced by partial immersion of the body in a hydrotherapy whirlpool bath at 112 ± 3°F for 30 minutes.

Results. The results are shown in Table I. It is apparent that relatively large amounts of adrenal corticoids are excreted in the sweat induced by exercise and thermal stimulation.

Discussion. Increased urinary excretion of adrenal corticoids occurs during response of the body to many types of stress[3-5] and is believed to indicate increased activity of the adrenal cortex. Hoagland,[3] using the method of Heard and Sobel for adrenal corticoids and a method specific for 17-ketosteroids, found a rise in the urinary output of both groups of substances after intramuscular injection of adrenal cortical extract. Since the rate of excretion of adrenal corticoids in sweat during exercise and thermal stimulation in our experiments exceeded the resting rate of renal excretion it is a reasonable assumption that it indicates an activation of the adrenal cortex in response to the stresses of heat and strenuous exertion. Our results also emphasize the fact that in stresses associated with sweating, a significant fraction of the total corticoid excretion is accounted for in the sweat.

Conclusion. There is a significant excretion of adrenal corticoids in sweat induced by exercise and thermal stimulation.

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5 Venning, E. H., and Kazmin, V., *Endocrinology*, 1946, **39**, 131.