

TABLE I.
Average Temperature Changes During 5 Menstrual Cycles in Each of Four Subjects.

		Menstrual	Post-mens.	Pre-ovul.	Ovulative	Post-ovul.	Premenstr.	Correlation coefficient
Subj. I	Temp.	97.5	97.4	97.4	97.1	97.8	97.9	+.850
	S.D.*	.40	.29	.36	.22	.41	.38	
Subj. II	Temp.	98.4	98.5	98.2	98.1	98.6	98.9	.860
	S.D.	.23	.31	.30	.16	.33	.27	
Subj. III	Temp.	97.9	97.7	97.6	97.6	98.5	98.4	.833
	S.D.	.31	.24	.22	.24	.39	.45	
Subj. IV	Temp.	98.3	98.3	98.1	97.8	98.4	98.7	.912
	S.D.	.28	.18	.27	.23	.30	.21	

*Standard deviation.

rank-correlation coefficients of body temperatures with vaginal smears arranged in the order (1) ovulative, (2) preovulative, (3) post-menstrual, (4) menstrual, (5) post-ovulative, (6) premenstrual are statistically significant, the values ranging from +0.833 to 0.912.

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Effect of Massive Doses of Adrenal Cortical Hormone on the Albino Rat.*

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The effect on the reproductive system, whether direct or indirect, of a deficiency in the adrenal-cortical hormone is well established. A hypersecretion has been held responsible for adrenal virilism but attempts to produce sexual precocity or other abnormalities of the reproductive system by injecting the hormone into normal animals have not given uniform results.

Howard and Grollman,¹ in the latest investigation on the effect of hypersecretion, injected a moderate excess of cortical hormone into normal rats for a maximum period of 57 days. Their results were negative and they attribute the positive results reported by some others to nonspecific impurities in their extracts.

The amount of hormone which could be injected in any of these experiments, however, is not comparable to the excess which might be secreted by a cortical tumor. Fortunately the new method of

* The investigation was carried out with the aid of a grant from the Committee on Scientific Research of the American Medical Association.

¹ Howard, E., and Grollman, A., *Am. J. Physiol.*, 1934, **107**, 480.

Grollman, Firor, and Grollman² of absorbing the adrenal-cortical hormone on charcoal, makes it possible to give larger quantities *ad libitum* of a potent extract than could possibly be injected. It also has the advantage of making the hormone continuously available and the conditions, therefore, are more comparable to those of normal secretion. It seemed worthwhile to reexamine the problem and to test the effect of excessive amounts of the hormone, especially on growth and on the reproductive system of normal rats.

Five female albino rats of Wistar stock with their littermate controls were used. The group was kept small because of the expense of the extract. The experiment was started when the rats were 26 days old and was continued for 26 days for one and from 72 to 89 days for the other 4, in order to give time for all possible changes to express themselves. The cortical-hormone combination was kindly furnished by Dr. George A. Harrop. It was prepared in his laboratory according to the method of Grollman, Firor, and Grollman.² It was assayed on adrenalectomized rats and its potency assured. One gram was equivalent to 200 or 300 gm. of fresh beef cortex. This charcoal-adsorbate was mixed in gradually increasing amounts with a weighed standard ration until the dose for each rat reached a gram per day. Those fed for long periods received then the equivalent of from 15,000 to 18,000 gm. of fresh cortex, a much greater quantity than has been reported in any previous work.

Normal sexual development was indicated by the opening of the vagina which averaged for both groups 39 days, by the regularity of the cycles, as indicated by daily vaginal smears and by the weights of the ovaries at autopsy and their histological picture compared

TABLE I.
Summary of Data on the Effect of Massive Doses of Adrenal-Cortical Hormone on Long Period Experiments on 4 Albino Rats. All Numbers Are Averages.

	Experimental	Control
Initial age in days	26	26
Duration of experiment	79.2	79.7
Initial body weight	54.7	54.2
Final body weight	222.0	212.0
Age at opening of vagina	39.0	39.4
Weight of ovaries in mg.	47.03	43.50
Ovaries, % of final body wt.	0.0211	0.0205
Weight of adrenals in mg.	28.2	28.0
Adrenals, % of body wt.	0.0127	0.0132
Weight of thyroid	16.42	20.75
Thyroid, % of body wt.	0.0739	0.0978
Total gm. charcoal-combination in equivalent gms. cortex	18650	
Gm. charcoal-combination fed per rat per day, in equivalent gm. cortex	234	

² Grollman, A., Firor, M., and Grollman, E., *J. Biol. Chem.*, 1935, **110**, 189.

with those of the controls. Other endocrine glands were studied and were similar in their weights and in histological structure to those of the controls. Although the experimental animals gained a little faster than the others, at autopsy, the average difference was too small to be regarded as significant. A summary of these data is given in Table I.

Conclusion. The negative results obtained from the feeding of massive doses of charcoal adsorbate, prepared from beef adrenal cortex may indicate that the substance in the adrenal cortex, which stimulates the reproductive system, is a different hormone from that demonstrated by Harrop³ as affecting the metabolism of salt and water and it may not be extracted by the methods at present in use for extracting the latter. The excellent condition of the experimental animals is evidence that the substance is not toxic.

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Effect of Stimulus of Suckling Upon Galactin Content of the Rat Pituitary.

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In a previous experiment we were able to demonstrate that the stimulus of suckling and/or the removal of milk from the mammary glands markedly decreased the galactin content of the post-partum rat pituitary gland.

Selye *et al.*¹ have shown that the act of suckling prevented the involution of the mammary glands of the rat during a period of 14 days, even though the milk ducts were ligated. Turner and Reineke,² working with 2 goats, suspended milking on one side of the udder about 30 days after parturition, while the other side was milked regularly. Histological sections of biopsy specimens taken 65 days after the beginning of the experiment revealed that the alveolar structure was still well defined on the unmilked side. The procedure

³ Harrop, G. A., *Johns Hopkins Hosp. Bull.*, 1936, **50**, 11 and 25.

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¹ Selye, H., Collip, J. B., and Thomson, D. L., *Endocrin.*, 1934, **18**, 237.

² Turner, C. W., and Reineke, E. P., *Mo. Agr. Exp. Sta. Res. Bul.*, 1936, 235.