TABLE I.
Cholesterol in Rat Ovaries During the Reproductive Cycle.*

	Period (days)	No. of rats	Body wt g	Ovarian wt mg	Total cholesterol mg	Cholesterol parts/1000	No. of fetuses or suckling young
Control	diestr.	10	223	62.5 (36.3- 94.8)	.45 (.30-.65)	7.3 (5.0- 9.0)	—
Pregnancy	10	7	223	60.9 (40.5- 66.9)	.64 (.53-.74)	10.6 (8.6-13.1)	7
	14	9	259	83.5 (73.5- 99.8)	.63 (.44-.79)	7.6 (4.8- 9.8)	9
	18	5	331	104.8 (100.0-105.2)	.80 (.72-.93)	7.7 (7.0- 9.3)	12
Pseudopreg.	8	6	218	43.5 (35.8- 53.8)	.47 (.36-.58)	11.0 (7.7-13.7)	—
Lactation	1	5	224	67.1 (60.0- 77.2)	.49 (.46-.51)	7.3 (6.4- 8.5)	9
	5	6	223	58.4 (41.4- 78.7)	.41 (.30-.51)	7.2 (5.1- 9.7)	8
	10	7	220	49.9 (42.3- 58.2)	.54 (.36-.68)	11.4 (6.2-14.3)	8
	15	7	245	52.0 (34.6- 71.3)	.44 (.30-.52)	8.6 (7.7- 9.7)	8

* All values are average, the range indicated by ( ).

is possible to demonstrate placentomata in the uterus and thus when there must be large amounts of circulating progesterone.[9] It is possible to demonstrate placentomata in the uterus on the 15th day of lactation provided an adequate number of young are suckling (8 or more).

The total ovarian cholesterol was found to be highest on the 18th day of pregnancy yet it is impossible to secure placentomata in the non-pregnant horn of a unilateral pregnant rat at this time.[9] Since functional corpora lutea or progesterone in the rat are necessary for the maintenance of pregnancy, it seemed odd that the cholesterol content of the ovaries in parts per thousand did not remain high throughout pregnancy. This suggests further studies on the ovaries of pregnant rats. It cannot be stated conclusively from these results that cholesterol acts a precursor of progesterone but in certain instances it appears that high ovarian cholesterol is associated with high levels of progesterone secretion.

[9] Burrows, H., *Biological Actions of Sex Hormones*, Cambridge Univ. Press, 1945, 419.

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Turnover of Serum Protein in Adrenalectomized Rats.*

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In previous experiments adrenal cortical activity was found to have no effect on the concentration of serum antibodies or on any other fraction of the serum proteins.[1] This finding, however, did not preclude the pos-

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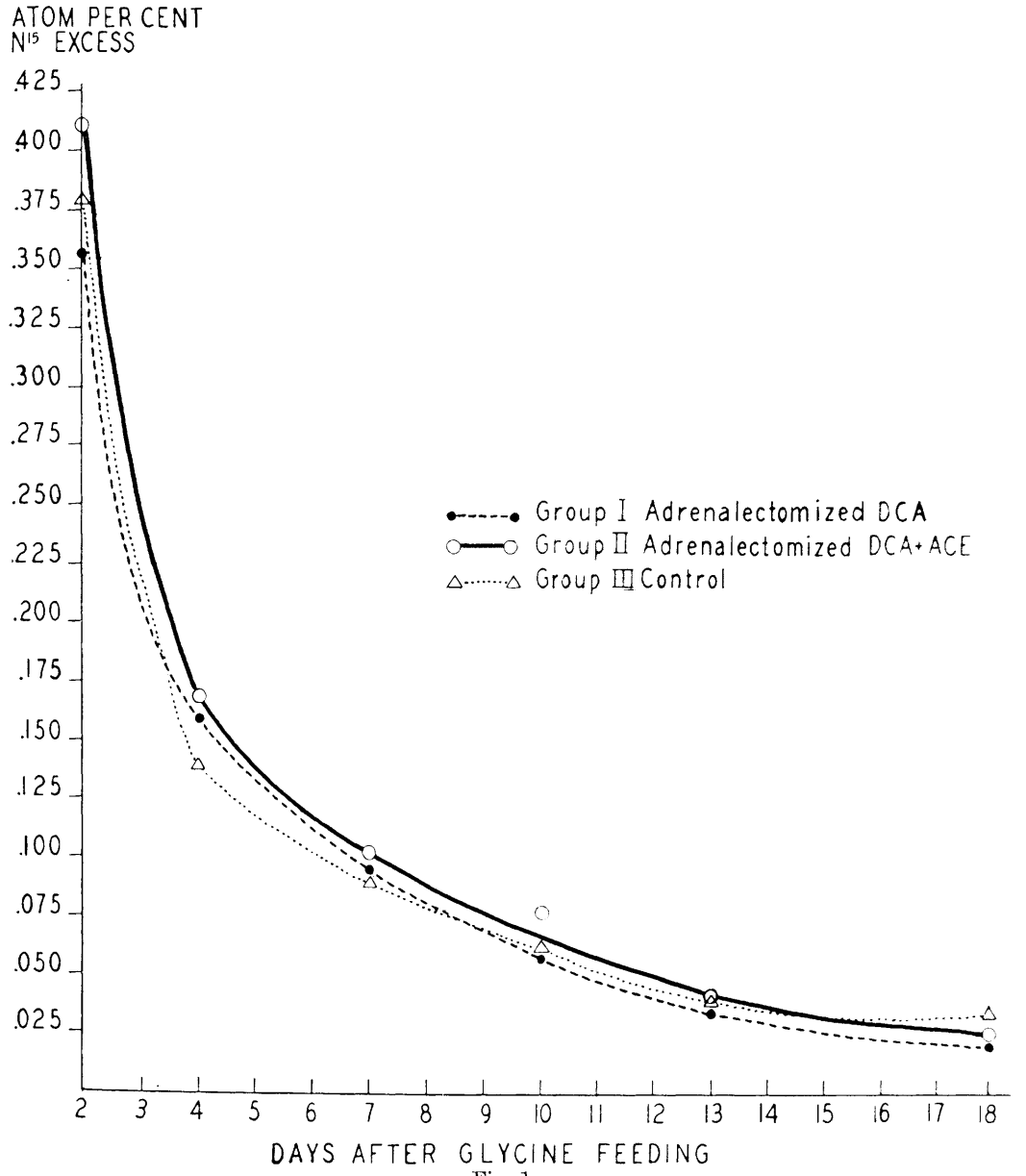

Fig. 1.

The half lifetime of serum proteins, estimated from the rate of decline of atom % N^{15} excess, is the same in all 3 groups.

sibility that the adrenal cortical hormones exerted a considerable influence on the turnover of the serum proteins. It therefore seemed desirable to determine the rates of synthesis and degradation of the serum proteins in adrenalectomized rats, particularly in view of the widely held belief that adrenal cortical activity influences protein catabolism.[2]

Methods and materials. Nine adult male

[1] Eisen, H. N., Mayer, N. M., Moore, D. H., Tarr, R. R., and Stoerk, H. C., PROC. SOC. EXP. BIOL. AND MED., 1947, **65**, 301.

[2] Long, C. N. H., Katzin, B., and Fry, E. G., *Endocrinology*, 1940, **26**, 309.

TABLE I.
Rate of Decline of Atom % N^{15} Excess in Total Serum Proteins.

Group	Procedure	Animal No.	Days after conclusion of feeding isotopically-labelled glycine					
			2	4	7	10	13	18
I	Adrenalectomy	58	—	.162	.093	.059	.038	.018
	DCA	61	.345	.155	.091	.052	.030	.013
		67	.368	.167	.105	.064	.038	.033
II	Adrenalectomy	68	.343	.200	.134	.068	.051	.033
	DCA	73	.473	.159	.092	.065	.044	.024
	ACE	65	.420	.151	.105	.084	.034	.017
III	Controls	74	.399	.142	.107	.072	.049	.033
		75	.353	—	.083	.065	.038	.031
		69	.381	.145	.081	.049	.038	.029

albino rats of the Sherman strain, ranging in weight from 250 to 295 g were divided into 3 groups. The animals of Group I were bilaterally adrenalectomized under ether anaesthesia and were maintained during the post-operative period on Rockland rat diet, subcutaneous injections of desoxycorticosterone acetate (DCA),§ 0.4 mg on alternate days, and on drinking water containing 1% sodium chloride. The animals of Group II were treated similarly. However, from the ninth post-operative day to the end of the experiment they received, in addition, daily injections of 0.5 ml adrenal cortical lipoextract (ACE).‖ Group III was composed of unoperated, uninjected control animals.

From the tenth to the twelfth post-operative days animals in all three groups were fed glycine tagged with heavy nitrogen. The isotopically labelled glycine was incorporated into the diet and administered so that each animal received 0.4 mg per gram body weight. Beginning 48 hours after the cessation of the glycine feeding, and repeated at intervals of from 2 to 10 days, 0.5 ml of blood was collected from a freshly cut surface of the tail and the total serum proteins were examined for their content of N^{15} by methods previously described[3]. After 30 days the animals were exsanguinated and their blood analyzed for total protein, albumin, globulin, and total non-protein nitrogen.¶

Results. The animals of all 3 groups gained approximately 10% in body weight. The serum total proteins, albumin, globulin, and non-protein nitrogen values determined at the end of the experiment (40th post-operative day) were the same in Group I and in Group II and were within normal limits. The heavy nitrogen contents of the serum proteins are given in Table I and in Figure 1.

Discussion. Following the feeding of labelled glycine, the N^{15} which had been incorporated into the serum proteins was replaced by N^{14} at a rate which was identical for all 3 groups. These data indicate that the rate of synthesis of serum proteins is not affected by adrenalectomy or by the administration of ACE to adrenalectomized rats. Since the total "pool" of serum proteins seems to have been approximately the same in the several groups, the rate of serum protein breakdown appears likewise to have been no different. These data do not exclude the possibility that adrenal cortical activity exerts an influence on the turnover of *tissue* proteins.

The half lifetime of serum proteins in the rat (1½ days) was found to be considerably briefer than the value (about 12 days) found in rabbits by Schoenheimer et al.[4] Unless the

§ Generously provided by Schering Corporation, Bloomfield, N. J.

‖ Upjohn Company, Kalamazoo, Mich.

[3] Rittenberg, D., Keston, A. S., Rosebury, F., and Schoenheimer, R., *J. Biol. Chem.*, 1939, **127**, 291.

¶ We wish to thank Miss Genevive Corbett for these determinations.

[4] Schoenheimer, R., Ratner, S., Rittenberg, D., and Heidelberger, M., *J. Biol. Chem.*, 1942, **144**, 545.

repeated bleedings exerted a more profound effect on rats than on rabbits, no explanation for this difference is apparent.

Summary. The turnover of serum protein in the rat is unaffected by adrenalectomy, or by the administration of adrenal cortical lipoextract (ACE) to adrenalectomized animals.

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Increased Dental Caries Activity in the Syrian Hamster Following Desalivation.*

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The Syrian hamster (*Cricetus auratus*) has been used in the study of experimental dental caries and appears well suited for such investigation since the disease process in this animal appears similar to that described in humans.[1] Furthermore, the administration of fluorine with a caries producing diet has been shown to reduce the caries incidence,[2] a finding which roughly parallels observations in man.[3] It appeared of some importance to determine whether removal of the major salivary glands would be accompanied by increased caries activity since it is well known that removal, agenesis, or greatly reduced function of the salivary glands in humans is accompanied by rampant decay.[4-5] Such a response might be expected since increased caries activity subsequent to salivary gland extirpation has been observed in the albino rat.[6-9]

Experimental. The animals were of pure inbred stock and were raised on Purina Rabbit Checkers plus weekly supplements of fresh vegetables. They were kept in metal cages with wood shavings for bedding. When 42 days old (± 4 days), the animals were separated into a control group (Group I) and an experimental group (Group II). A comparable supplementary group (Group Ia) was available for additional comparisons. The experimental animals were desalivated during a period of 2 weeks. The parotid, submaxillary, and major sublingual glands were removed, under ether anesthesia, through a single midline incision beginning about 5mm from the mandibular symphysis and extending to the manubrium. Control animals were not operated upon. One week after the last operation,‡ an experimental diet and tap water were provided *ad libitum* to Groups I and II. The diet consisted of whole wheat flour, 40%; whole powdered milk, 30%; glucose, C.P., 20%; alfalfa, 5% brewers yeast, 4%; and sodium chloride, 1%. The supplementary control animals (Group Ia), which were used for another study, were of the same age but had been started on the diet 25 days previously.

Animals were weighed at weekly intervals.

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1 Keyes, P. H., *J. D. Res.*, 1946, **25**, 341.

2 Dale, P. P., Lazansky, J. P., and Keyes, P. H., *J. D. Res.*, 1944, **23**, 445.

3 Deatherage, C. F., *J. D. Res.*, 1943, **22**, 173.

4 Prinz, H., *D. Cosmos*, 1932, **74**, 129.

5 Faber, M., *Acta. Paediat.*, 1942, **30**, 148.

6 Kondo, S., Ichikawa, T., and Arai, M., *Tr. Soc. path. jap.*, 1938, **28**, 461.

7 Hukusima, M., *Tr. Soc. path. jap.*, 1940, **30**, 245.

8 Cheyne, V. D., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 587.

9 Weisberger, D., Nelson, C. T., and Boyle, P. E., *Am. J. Orthodontics and Oral Surg.*, 1940, **26**, 88.

‡ Four animals failed to survive the operation and, consequently, have not been included in the data.